

POPULUS : A BIBLIOGRAPHY OF WORLD LITERATURE, 1854 - 1963

R. E. Farmer, Jr., and J. S. McKnight



SOUTHERN FOREST EXPERIMENT STATION
T. C. Nelson, Director
FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

1967

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POPULUS : a bibliography of world literature, 1854-1963

R. E. Farmer, Jr., and J. S. McKnight¹

This bibliography is intended as a comprehensive reference for international use by researchers and land managers.

The impetus for its preparation came from the Poplar Council, an organization formed in 1964 by U. S. industrial and public foresters to advance knowledge of poplar culture, encourage planting and management of poplars, and stimulate utilization of the wood.

The Council decided soon after its formation that an English-language bibliography would be useful. It thereupon appealed to the Commonwealth Forestry Bureau, Oxford, England, for permission to use the references and abstracts that had been accumulated in connection with the publication of **Forestry Abstracts**. The Bureau responded by furnishing, at nominal cost, the citations and annotations printed here. There remained the task of classifying and arranging the citations, and that was undertaken by the present authors.

The bibliography is arranged first by species or groups of species, then by subject-matter categories. About half the references deal with poplars in general or with several species; these are grouped under the head *Populus spp.* A conspectus of primary subject-matter heads and subheads is included as a Key to Subject-Matter Classification. Numerals in the Key and preceding the citations refer to subject-matter assignments based upon the **Oxford System of Decimal Classification for Forestry**, the authorized English version of which was published by the Commonwealth Agricultural Bureaux, Farnham Royal, England.

To most efficiently use the bibliography, the reader should refer first to the Table of Contents for species and then to the Key for subject matter. Information on titles of publications cited and other aspects of the citation entries will be found in **Guide to the Use of Forestry Abstracts**, also available from the Commonwealth Agricultural Bureaux.

¹The authors are on the staff of the Southern Hardwoods Laboratory, which is maintained at Stoneville, Mississippi, by the U.S. Forest Service in cooperation with the Mississippi Agricultural Experiment Station and the Southern Hardwood Forest Research Group.

Key to Subject-Matter Classification

0 GENERAL

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

- 11 Site Factors: Climate, Situation, Soil, Hydrology
 - 111 The Atmosphere. Meteorology. Climate and Microclimate
 - 114 Soil. **Soil** Science
 - 116 Hydrology. Water Conservation, Soil Conservation and Erosion
- 15 Animal Ecology
 - 151 Mode of Life, Autecology, Habits, Adaptability
 - 156 Game Management. Hunting and Shooting
- 16 General Botany
 - 160 Plant Chemistry
 - 161 Physiology
 - 164 Morphology
 - 165 Phylogeny, Evolution. Heredity, Genetics and Breeding, Variation
 - 168** Histology
- 17 Systematic Botany
 - 172.8 Eumycetes (True Fungi)
 - 176.1 Dicotyledoneae
- 18 Plant Ecology
 - 181** Mode of Life, Autecology. Silvicultural Characters of Trees
 - 182 **Synecology**, Plant Sociology
 - 187** Vegetation Types

2 SILVICULTURE

- 22 Silvicultural Systems. Constitution and Composition of Stands; Forms of Stand
 - 221 High Forest Systems
 - 222 Coppice, Pollarding and Lopping Systems
 - 226 Changes of **Silvicultural** System. Conversion (**by** System or Species)
 - 228** Constitution and Composition of Stands; Forms of Stand
- 23 Regeneration and Formation of Stands
 - 231 Natural Regeneration
 - 232 Artificial Regeneration
 - 233 Afforestation
 - 234 Formation of Forest by Natural Succession
 - 235 Underplanting, advance Planting, etc. Nurses and Formation of Mixtures
 - 236 Core of Regeneration or Plantations in the Initial Stages of Establishment
 - 237 Amelioration of Forest Sites
 - 238 Timber Plantation Crops Requiring Special Treatment
- 24 Tending of **Stands** and Trees
 - 242 Thinnings

- 243 Opening of the Canopy (Increment Fellings, Overhead Release and Improvement **Fellings**)
- 244 Climber Cuttings, etc.
- 245 Tending of Trees

- 25 Treatment of Defective, Derelict or Very Open Stands
- 26 Combinations of Forestry with Agriculture
 - 263 Irrigated Forests
 - 265 Strips **or** Lines at Road, Rail and Canal Sides, etc.; Hedgerow Trees
 - 266 Shelterbelts, Windbreaks
 - 268** Pastured Forests. Grazing on Forest and Open Ranges
- 27 Arboreta, Arboriculture for Ornamental Purposes
 - 271 Arboreta
 - 273 **Ornamental Street** and Roadside Trees

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- 32 Felling and Related Operations
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 - 323 Felling and Subsequent Primary Conversion
- 33 Degree of Utilization and Waste
 - 332 Clearing the Felling Site
- 34 Storage of Wood in the Forest and at Log Dumps ("Landings")
- 35 Performance **Measurements** for Determining Piece Rates in Felling and Related Operations
 - 352 Performance Studies in Felling and Related Operations
- 36 Tools, Machines and Equipment for Felling and Related Operations
 - 367 Stump-Grubbing Tools and Equipment
- 37 Transport
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 - 412 **Silvicultural** Control
 - 414 Chemical Control
 - 416 Types of Injury
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 - 421 Air Currents
 - 422 Temperature Influences. Insolation
 - 424 Soil Conditions; Erosion Effects
 - 425 Chemical Influences (Atmospheric)

- 43 Forest Fires
 - 433 Solve and Disposal of Fire-Damaged Timber
 - 435 Benefits of Fire Control. Injurious Effects of Fire
- 44 Damage by Harmful Plants. Virus Diseases
 - 441 Forest Weeds
 - 442 Parasitic (Higher) Plants. Climbers and Epiphytes
 - 443 Fungi and Bacteria
 - 444 Virus Diseases
- 45** Damage by Animals
 - 451 Mammals
 - 453 Insects
 - 459 **Other** Animals
- 48 Injuries Due to Unknown or Complex Causes
- 5** FOREST MENSURATION
 - 52 Measurements of Stem Dimensions and Volume of Trees, Stands, Forests and Timber
 - 523 Bark (Including Bark Increment)
 - 524 Determination of the Volume of Trees and Stands
 - 525 Volume by Assortments. Merchantable Volume
 - 526 Log **Measurement**. "Scaling"
 - 53** **Special Measurements** of Trees and Stands (Crown Dimensions, Stand Density, etc.)
 - 531 Crown Dimensions, Crown Area, Crown Volume, Crown Ratio
 - 532 Quantity and Area of Foliage
 - 54 Assessment- of Site Quality
 - 541 Based on Height, Diameter, Volume, etc.
 - 542 By Ecological Methods
 - 548** Relation of Forest Site Quality to Total Production of Vegetable **Matter**
 - 55 Age Determination
 - 551 In Single Trees with Annual Rings
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 - 561 Increment in Height, Diameter, Basal Area, Form and Quality
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 - 64 Forestry as a Business: General
 - 644 Significance and Influence of Various Features of the Enterprise and its Parts
 - 65** **Special** Business Problems of Timber-Growing
 - 651 Calculation of Costs and **Profitability**
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 - 67 Assessment of Financial Results; Bookkeeping and Accountancy; Business Statistics; Short-Term Planning and Financing
- 676 Financing
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 - 73 Prices
- 8** FOREST PRODUCTS AND THEIR UTILIZATION
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 - 813** Wood Chemistry
 - 814 **Natural** Durability. Old Wood. Fossilized Wood
 - 815 Effect of Growth Factors on Structure and Properties
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 - 827 Bending. Moulding (other Than by Cutting)
 - 83** Timber Manufacturing Industries and Products
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 - 832 Mills, Their Functions and Products
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 - 845 Attack by Animals
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 - 848 Timberyord Practice. Handling and Storage of Timber
 - 85** "Grading" of Wood and Wood Products
 - 852 Detection, Recognition and Assessment of Injuries and Defects
 - 853 Grading of Wood in the Rough
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 - 902 History of Forests and Forestry
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 - 907 Indirect Significance of Forests
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 - 945 Advisory Services; Publicity; Education; Research
 - 946 Associations, Societies; Conferences; Institutions
 - 97 International Forest Policy and other International Collaboration
 - 971 Congresses and Conferences

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0 GENERAL

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A relationship was found between the effect of extracts of twig bark of various species and varieties on germination of spores of *Dothichiza populea* and the resistance of these species and varieties to attack. Detailed chemical studies of the extract of *Populus trichocarpa* are described.

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lus candicans [cf. Klopping and Kerk, 1951, *P. canadensis* to *P. davidiana*, 160.29] and bark extracts of *P. trichocarpa*. Neither gave particularly good results.

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164 MORPHOLOGY

164.3

Dehay, C. 1938. ACCIDENTIAL INTRACAULINARY ROOTS IN THE POPLAR. Bull. Soc. Bot. France 34(7/8): 529-33. Plant Sci. Lit. 7(14): 6. 1938.

164.5

Kholodny, N. G., Yaroshenko, G. D., and Takhtadzhyan, A. L. 1944. K EKSPERIMENTAL'NOY MORFOLOGII I TERATOLOGII LISTA. [A CONTRIBUTION TO THE EXPERIMENTAL MORPHOLOGY AND TERATOLOGY OF THE LEAF.] Bot. Zhurn. SSSR 29(4):99-107. [Russ.e.]

Kopeczky, F. 1952(1954). ERDESZETI GENETIKA ES HAZAI NYAR-NEMESITES. [FOREST GENETICS AND PLANT BREEDING IN HUNGARY.] Erdesz. Tud. Int. Evk., Budapest 2:51-65. [Hu.] From abstr. in Hung. Agric. Rev. 3(3):8. 1954. [E.]

164.6

[Canada: Ontario Agricultural College] 1960. [RATE OF POLLEN DISINTEGRATION.] Extr. from. Rep., Ont. Agric. Coll. Exp. Farm, Guelph, Ont. No. 84:40.

In a study of the rate of *pollen* disintegration in water, undertaken to elucidate *the* absence of *poplar* pollen in sphagnum bogs, poplar pollen was found to disintegrate rapidly, pine pollen least.

Catalan Bachiller, G. 1962. [STUDIES ON THE POLLEN OF POPULUS SPP.] Comun. Inst. For. Invest. Exp. Madrid 33(14): 12 pp. [Span.]

164.9

Larsen, C.M. 1961. DEVELOPPEMENT DES STOMATES DE PEUPLIERS AU COURS D'UNE ANNEE SECHE. [DEVELOPMENT OF POPLAR STOMATA DURING A DRY YEAR.] Physiol. Plant., Copenhagen 14(4): 877-89. 6 refs. [F.f.]

165 PHYLOGENY, EVOLUTION, HEREDITY, GENETICS AND BREEDING, VARIATION

Piccarolo, G. 1937. ATTIVITA DELL' ISTITUZIONE MIGLIORAMENTO PIOPO (1936-7) E STAZIONE SPERIMENTALE DI PIOPICOLTURA. [ACTIVITIES OF THE INSTITUTE FOR POPLAR BREEDING (1936-7) AND THE POPLAR CULTIVATION EXPERIMENT STATION.] In Atti del Congresso di Pioppicoltura 1937: 133-59. [It.]

165.1

Regnier, R. 1955. DE L'ORIGINE DES PEUPLIERS. [THE ORIGIN OF THE POPLARS.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/79-B, 5 pp. [F.] Gives a short account of *fossil* species, and discusses the evolution of the various sections of *Populus*.

165.3

Aljbenskii, A. V., Pjatnickii, S.-S., Jablovkov, A. S., Scepotjev, F. L., and Popov-Dekator, N. P. 1950. SELEKCIJA DREVESNYH POROD. [THE SELECTION AND BREEDING OF WOODY SPECIES.] Goslesbumizdat, Moscow and Leningrad. 228 pp. Many refs. [Russ.]

Alonzo, A. E. 1961. ASPECTOS ECOLOGICOS Y GENETICOS DE PINOS. [ECOLOGY AND GENETICS IN THE PINES.] Bol. Argent. For. 19(199): 9-11. [Span.]

Artaza, J.E. 1955. GENETIQUE ET SELECTION DES PEUPLIERS ESPACNOLES. [GENETICS AND SELECTION OF SPANISH POPLARS.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 1, 6 pp. [F.] A short account of the indigenous poplars and natural hybrids, and the hybrid American poplars used for breeding in Spain.

Bingham, R.T. 1963. PROBLEMS AND PROGRESS IN IMPROVEMENT OF RUST RESISTANCE OF NORTH AMERICAN TREES. [Pap.] FAO World Consult. For. Genet., Stockh. 1963. No. FAO/FORGEN 63/-6a/1, 12 pp. 62 refs.

Reviews the breeding now in progress to obtain *Melampsora*-resistant poplars, *Peridermium-harknessii*- and *Cronartium-fusiforme*-resistant hard pines, and *C.fusiforme*-resistant white pines.

Bogdanov, P. L. 1951. ITOGI RABOTY PO SELEKcii TOPOLEI v LENINGRADE. [SELECTION AND BREEDING OF POPLARS AT LENINGRAD.] Trud. Inst. Les. No. 8: 72-7. 5 refs. [Russ.]

A review in general terms of work so far done and methods used.

Elorrieta y Artaza, J. 1960. ESTUDIOS DE MEJORA DE LOS CHOPOS MAS INTERESANTES PARA ESPANA. [THE IMPROVEMENT OF POPLARS OF MOST INTEREST TO SPAIN.] Montes, Madrid 16(92): 115-31. [Span.]

Presents a *short* survey of *the* botanical and *silvicultural* characteristics of the genus, and gives a *history* of poplar breeding in Spain, reviewing in some detail *the work* of the regional forest departments and of *the Madrid Forest Research Institute*.

Giordano, E. 1961. SUMMARY OF GENETIC IMPROVEMENT OF POPLAR AND EUCALYPTS IN ITALY. Proc., 8th Ntheast. For. Tree Impr. Conf., New Haven, Conn. 1960: 8-12.

Heimbürger, C. 1951. REPORT ON FOREST TREE BREEDING: POPLAR. Progr. Rep. Field Lab. Proj. Ont. Dep. Lds. For. 1950/50-3.

Houtzagers, G. 1952. FOREST GENETICS AND POPLAR BREEDING IN THE NETHERLANDS. I. THE DIFFERENCE BETWEEN BREEDING WORK IN

FORESTRY AND AGRICULTURE OR HORTICULTURE. II. POPLAR BREEDING IN THE NETHERLANDS. I. Euphytica 1(1): 10-4. 7 refs. [E.du.] II. Euphytica 1(3): 161-74. 10 refs. [E.du.]

[International: World For. Congr.1960] 1962. [SELECTION AND BREEDING OF POPLARS IN ITALY. Proc. 5th World For. Congr., Seattle, 1960. Vol. 2 (Sect. 2): 806-8, 811-4. 5 refs. [E. or F., f. or e. span.]

Includes: Observations on the selection of *poplars of the section Leuce in Italy* (M. Sekawin [F.]); recent work on *Populus deltoides* in Italy (E. Giordano [E.]); and some observations of the morphology and classification of *Populus tremula* L. in Italy (G. Gramiglio [E.]).

[Italy: Cellulosa e Carta] 1953. L'ATTIVITA 1952-1953 DELL'ISTITUTO DI SPERIMENTAZIONE PER LA PIOPICOLTURA DI CASALE MONFERRATO. [ACTIVITY OF THE POPLAR RESEARCH INSTITUTE AT CASALE MONFERRATO DURING 1952-3.] Cellulosa e Carta 4(5): 10-1. [It.] Deals mainly with artificial hybridization, particularly the use of pollen from a polyploid form of "P. euramericana clone 438" for crossing with two clones of *P. angulata*, one of *P. nigra* and "P. euramericana I 214." The pollen of this polyploid has larger grains and more variation in size of grains than the diploid female parent, and germinability increased by one-third.

Jovanovic, B. 1959. NEKA ISKUSTVA I ZADACI OPLEMENJIVANJA TOPOLA KOD NAS. [EXPERIENCE AND TASKS IN POPLAR BREEDING IN YUGOSLAVIA.] Topola, Beograd 3(11): 877-93. 16 refs. [Serb.f.] Summarizes some recent research, and discusses the setting up of a section concerned with breeding, under the Yugoslav National Poplar Commission.

[Jugoslavia: Topola] 1959. IZBOR I EVIDENCIJA POLAZNIH TOPOLOVIH STABALA ZA DALJU SELEKCIJU. [CHOICE OF THE FIRST POPLAR TREES FOR FURTHER SELECTION, AND THE RECORDING OF INFORMATION ON THEM.] Topola, Beograd 3(12): 986-99. 7 refs. [Serb.] Indicates the characters desirable in such poplars and presents a detailed form for recording particulars of outstanding trees, with instructions on how to complete it. The form is a draft submitted to the sub-group for selection and breeding of the Yugoslavian National Poplar Commission.

1959. "PUTSVA ZA PRAKTICNO IZVODENJE SELEKCIJE TOPOLA. [INSTRUCTIONS FOR PRACTICAL WORK IN POPLAR BREEDING.] Topola, Beograd 3(12): 1004-16. [Serb.] Gives detailed instructions, based on Italian methods, or the actual steps to be taken in poplar breeding, with diagrams showing desirable tree characteristics and nursery lay-out.

Kauffman, E. 1927. SPEEDING UP THE POPLAR. Amer. For. & For. Life 33: 269-71.

Knezevic, I. 1958. METODOLOGIJA SELEKCIJE TOPOLA. [METHODS OF POPLAR SELECTION.] Sum. List 82 (1/2): 38-42. 2 refs. [Croat.] Describes methods practiced at the Istituto di Sperimentazione per la Pioppicoltura, Casale Monferrato, Italy.

Kopieczky, F. 1952. (1954). ERDESZETI GENETIKA ES HAZAI NYAR-NEMESITES. [FOREST GENETICS AND PLANT BREEDING IN HUNGARY.] Erdesz. Tud. Int. Evk., Budapest 2:51-65. [Hu.] From abstr. in Hung. Agric. Rev. 3(3):8. 1954. [E.]

Langner, W. 1962. [RESULTS OF BREEDING TRIALS WITH BLACK POPLARS.] Holz-Zbl. 88(155/156): 2509-12. 9 refs. [G.]

Larsen, C.M. 1960. L'AMELIORATION DU PEUPLIER PAR VEIE GENETIQUE. [IMPROVEMENT OF THE POPLAR BY BREEDING.] Bull. Soc. For. Belg. 67(3/4): 113-35; 149-72. 9 refs. [F.] A detailed account of methods employed and results obtained in poplar breeding by the Institut de Populiculture, Union Alu-mettiere, Grammont.

Martinez Mata, F., and Zuloaga Roman, A. 1957. SECCION DE GENETICA FORESTAL. [FOREST GENETICS SECTION.] An. Inst. For. Invest. Exp., Madrid No. 2:27-30. [Span.] Reports work in progress, mainly on pines and poplars.

Nemec. 1926. THE DESCENDANTS OF SOME FEMALE PYRAMIDAL POPLARS. Bot. Abstr. 15: 7634.

[Netherlands: Ned. Boschb.-Tijdschr.] 1957. DE VEREDELING IN DE BOSBOUW IN NEDERLAND. [TREE BREEDING IN FORESTRY IN THE

NETHERLANDS.] Ned. Boschb.-Tijdschr. 29(3/4): 53-81; 91-121. [Du.e.]

Petr, L. 1937. IMPORTANZA DELLA PATOLOGIA VEGETALE NELLE RICERCHE SPERIMENTALI PER IL MIGLIORAMENTO DELLA CULTURA DEL PIOPO. [THE IMPORTANCE OF PLANT PATHOLOGY IN EXPERIMENTAL RESEARCH FOR POPLAR BREEDING.] In Atti del Convegno di Pioppicoltura 1937: 51-4. [It.]

Rovskii, V.M. 1951. SELEKCIJA LESNYH POROD V UZBEKISTANE. [SELECTION AND BREEDING OF TREE SPECIES IN UZBEKISTAN.] Trud. Inst. Les. No. 8: 132-51. 15 refs. [Russ.]

A preliminary report on work in progress at the Central Asian Forest Research Institute on the selection and hybridization of walnuts, elms, and poplars.

Rudolf, P. O., and others. 1956. LAYING THE FOUNDATION FOR FOREST TREE IMPROVEMENT IN THE LAKE STATES. Wis.-Mich. Sect. Soc. Amer. For., Lansing, Mich. 32 pp.

Proceedings of a technical session of the section, held in Feb. 1956. The following papers are included: Laying the foundation for forest tree improvement (P. O. Rudolf); Laying the foundation for improving the pines in the Lake States (R. G. Hitt); Laying the foundation for improving the spruce in the Lake States (H. Nienstaedt); and Laying the foundation for improving the aspen and cottonwoods in the Lake States (P. N. Joranson).

Schmitz-Lenders, B. 1953. PAPPELPROBLEMS. [POPLAR PROBLEMS.] Forst u. Holz 8(2/3): 13-20; 29-52. [G.]

Sekawin, M. [1959?] L'EXPERIMENTATION EN ITALIE DES CLONES DA PEUPLIER SELECTIONNES PAR L'INSTITUT D' EXPERIMENTATION POUR LA POPULICULTURE DE CASALE MONFERRATO. [TRIALS IN ITALY WITH SELECTED POPLAR CLONES FROM THE POPLAR RESEARCH INSTITUTE AT CASALE MONFERRATO.] Istituto di Sperimentazione per la Pioppicoltura, Casale Monferrato, Italy. 94 pp. [F.]

1961. LA SELEZIONE E LA CULTURA DEL PIOPO NELL'UNIONE SOVIETICA. [THE BREEDING AND GROWING OF POPLARS IN THE U.S.S.R.] Cellulosa e Carta 12(7):5-10. [It.f.e.g.] Deals particularly with work on polyploid aspen, and hybrids of the section turanga, which are very resistant to drought.

1963. [POPLAR GENETICS.] [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63/-4/4, 6 pp. 11 refs. [F.f.] Discusses the different sections of the genus Populus, actual and possible hybrids, and exotic species worth trying in different parts of Europe.

1963. [THE GENETIC IMPROVEMENT OF POPLAR IN ITALY.] Cellulosa e Carta 14(8): 5-13. 9 refs. [It.f.e.g.] A brief review of the systematy and genetic constitution of poplars grown in Italy, and their bearing on breeding.

Shea, K. R., Kuntz, J. E., and Riker, A. J. 1954. BREEDING POPLAR FOR DISEASE RESISTANCE. For. Res. Note Univ. Wis. No. 15, 2 pp.

and Riker, A.J. 1954. BREEDING POPLARS FOR DISEASE RESISTANCE. Abstr. in Phytopathology 44(9): 505.

Stout, A. B., and Schreiner, E. J. 1933 RESULTS OF A PROJECT IN HYBRIDIZING POPLARS. J. Hered. 24: 216-29.

Tyszkiewicz, S. 1952. SELEKCIJA TOPOLI W ZAKLADZIE NASIEN-NICTWA. [SELECTION OF POPLARS IN THE SEED RESEARCH SECTION [OF THE FOREST RESEARCH INSTITUTE, WARSAW.] Sylwan 96(4): 469-72. [Pol.]

Describes work done since February 1951 on *P. tremula* (artificial pollination) and *P. euroamericana* × *P. nigra italica* (seeds and seedlings).

[U.S.S.R.: Sborn. Rabot Lesn. Hoz.] 1959. OPYT I DOSTIZENIJA PO SELEKCIJI LESNYH POROD. [EXPERIMENTS AND ACHIEVEMENTS IN THE SELECTION AND BREEDING OF FOREST SPECIES.] Sborn. Rabot Lesn. Hoz. Vsesojuz. Nauc.-Issled. Inst. Lesovod. No. 38, 300 pp. Many refs. [Russ.]

Wettstein, W. von. 1947. SKOGSGENETISKA UNDERSOKNINGAR. [INVESTIGATIONS IN FOREST GENETICS.] Svenska SkogsvForen. Tidskr. 45(6):364-76. [Sw. sw.]

A brief review of the author's work on *Populus*, *Pinus sylvestris*, *Picea abies*, and *Larix decidua*.

Wolfgang. 1930. ARTIFICIAL BREEDING OF POPLARS. Forstl. Rundschau 3 :268.

165.4

Andersson, E., and Strand, L. 1951. NAGRA DATA FRÅN TVÅ JÄMFÖRANDE FÖRSÖKSODLINGAR MED ASP. [DATA FROM TWO COMPARATIVE BREEDING EXPERIMENTS WITH ASPEN.] Svensk PappTidn. 54(3): 81-92. 3 refs.[Sw.E.] Medd. Foren. Vaxtforadl. Skogstrad No. 54.

Vloten, H. "an. 1949. HET VEREDELINGSWERK BEGONNEN. [SELECTION AND BREEDING STARTED.] Korte Meded. Bosbouwproefsta. T.N.O., Wageningen No. 3, 16 pp. [Duc.]

Wettstein, W. "on. 1937. FORESTRY BREEDING EXPERIMENTS—ESPECIAL WITH POPULUS. Bot. Notiser 1937: 272-84. Plant Breed. Abstr. 8(2): 190. 1938.

1938. INCREASED GROWTH AND HETEROSIS IN POPLAR CROSSINGS. Forstwiss. Cbl. 60(17) :555-8.[G.]

165.41

Bialobok, S. 1956 (1957) PROBLEMATYKA I METODYKA PRAC NA DZIEŁACH W ZAKŁADZIE DENDROLOGII I POMOLOGII W KORNIE. [PROBLEMS AND METHODS IN STUDIES ON POPLARS AT THE KORNICK INSTITUTE OF DENDROLOGY AND POMOLOGY.] Arbor. Kornickie, Poznań No. 2: 145-73. 24 refs. [Pol.e.russ.] The studies concern. systematy and breeding.

1956(1957). WSTĘPNE WYNIKI HODOWLI TOPOLI W ZAKŁADZIE DENDROLOGII I POMOLOGII W KORNIE. [PRELIMINARY REPORTS ON POPLAR BREEDING AT THE KORNICK INSTITUTE OF DENDROLOGY AND POMOLOGY.] Arbor. Kornickie, Poznań No. 2: 175-93. 13 refs.[Pol.e.russ.]

Discusses conclusions reached from observation of 184 combinations of crosses (50,000 hybrid seedlings) made in 1950-55.

Bogdanov, P. L. 1960. RAZMERY DREVESNYH VOLOKON U GIBRIDNYH TOPOLEJ. [FIBRE DIMENSIONS OF HYBRID POPLARS.] Lesn. Z., Arhangel'sk 3 (1): 29-30. [Russ.]

Presents the results of some Soviet measurements on 14 species and hybrids, and points out the excellent properties of *Populus* × 'Leningrad'.

[Czechoslovakia] 1951. PROSTY ZPUSOB GENERATIVNIHO KRIZENI TOPOLU. [A SIMPLE METHOD OF POPLAR HYBRIDIZATION.] Csl. Les 31(12) : 274-5. [Cz.]

Herpka, I. 1960. HIBRIDIZACIJA I SELEKCIJA TOPOLA. [POPLAR HYBRIDIZATION AND SELECTION.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 1: 43-57. 14 refs. [Serb. serb.f.]

The work described was begun in 1955 as part of the program of the Croatian Institute of Forest and Game Research, Zagreb. Data on the origin and growth of hybrids obtained by controlled hybridization and by open pollination. are tabulated, and recommendations for future research given. [Cf. Jovanovic and Tucovic, 1960, this subject classification.]

Hyun, S.-K., and Hong, S.-C. 1959. INTER- AND INTRA-SPECIES HYBRIDIZATION IN POPLARS. (1). LIST OF POPLAR HYBRIDS PRODUCED BY THE INSTITUTE OF FOREST GENETICS IN SUWON. Res. Rep. Inst. For. Genet., Suwon No. 1:61-73.[E.kor.]

Jovanovic, B., and Tucovic, A. 1958. PRETHODNOSAOPSTENJE O HIBRIDIZACIJI TOPOLA U 1957 GODINI. [A PRELIMINARY REPORT ON POPLAR HYBRIDIZATION IN 1957.] Sumarstvo 11(5/6): 263-77. 23 refs. [Serb.e.f.]

and Tucovic, A. 1958. HIBRIDIZACIJA TOPOLA U 1957 GODINI. [POPLAR HYBRIDIZATION IN 1957 AT THE DENDROLOGICAL INSTITUTE, FORESTRY FACULTY, BELGRADE.] Topola, Beograd No. 7: 559-94. 23 refs. [Serb.]

A longer article than that noticed above, with illustrations.

and Tucovic, A. 1960. NOVI HIBRIDNI TOPOLA DOBIJENI U 1959 GODINI. [NEW POPLAR HYBRIDS OBTAINED IN 1959.] Sumarstvo 13 (3/4): 137-48. 6 refs. [Serb.serb.f.]

and Tucovic, A. 1960. NEKA NASHA ISKUSTVA SA HIBRIDIZACIJOM TOPOLA [SOME OF OUR EXPERIENCES IN POPLAR

HYBRIDIZATION.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 2:39-46. 5 refs.[Serb.f.]

Summarizes the experience of the authors in poplar breeding since 1956, with recommendations or methods and choice of material. Data on crosses produced and first-year growth of the 14 most successful hybrids raised in 1960 are tabulated. [Cf. Jovanovic and Tucovic, 1960, above, and Jovanovic, 1959, *Populus* sp., 165.31]

Koltay, G. 1951(1953). SZABADEPORZASUNYAR-MAGOSEMETE POPULACIOK VIZSGALATA. [INVESTIGATIONS ON SEEDLING POPULATIONS OBTAINED BY FREE POLLINATION OF POPLARS.] Erdesz. Tud. Int. Evk. 1:31-41.[Hu.russ.e.g.]

Kopecky, F. 1956. FEKETENYARNEMESITESUNKERDESEI. [PROBLEMS OF BLACK POPLAR BREEDING IN HUNGARY.] Erdesz. Kutatas., Budapest 1956(1) : 17-32. 8 refs.[Hu.russ.e.g.]

1956. PROBLEMS OF BREEDING BLACK POPLAR IN HUNGARY. Acta Agronomica Academiae Scientiarum Hungaricae, Budapest 6(3/4):307-20. 8 refs. [E.e.russ.g.]

LO, T-Y. 1959. [NEW ACHIEVEMENTS IN PRODUCING FASTER-GROWING NEW HYBRIDS THROUGH APPLYING MICURIN'S GENETIC PRINCIPLES.] For. Sci., Peking 1959(3): 259-60. [Chin.]

Maric, B., and Jovanovic, M. 1957. PROIZVODNJA SEMENA TOPOLA U VODENIM KULTURAMA I NA PATULJASTIM STABLIMA. [PRODUCTION OF POPLAR SEED.. BY WATER CULTURE AND ON DWARF STOCKS.] Sumarstvo 10(5/6): 351-7. 7 refs. [Serb.e.f.] Describes methods of controlled crossing using the cut-branch technique and of grafting to produce dwarf plants for crossing experiments, with special reference to *Populus alba*, *P. tremuloides*, and *P. "Bachofeni"*.

Martinez Mata, F. 1960. [FORESTRY GROUP SECTION FOR FOREST GENETICS.] An. Inst. For. Invest. Exp., Madrid 32(5): 71-7. Man.1

and Zuloaga Roman, A. 1958. SECCION DE GENETICA FORESTAL. ESTUDIOS DE MEJORA DEL CHOPO. [SECTION OF FOREST GENETICS. STUDIES IN THE IMPROVEMENT OF POPLAR.] An. Inst. For. Invest. Exp., Madrid 30(3):9-19. [Span.]

Reviews work on the hybridization of poplars in 1956-57, and reports briefly on work in the same field during 1958.

Meyer-Uhlcnried, K. -H. 1958. UNTERSUCHUNGEN UBER DIE VERERBUNG EINES ANATOMISCHEN MERKMALS BEI KREUZUNGEN "ON PAPPELN VERSCHIEDENER SEKTIONEN. [INVESTIGATIONS OF THE TRANSMISSION OF AN ANATOMICAL FEATURE IN CROSSINGS OF POPLARS OF DIFFERENT SECTION.] Zuchter 28(5):209-16. 20 refs. [G.g.] Transl. by J. Hardy, Commonw. Sci. Industr. Res. Organ. Aust. No. 4227, 19 pp. 1960.

Rovskij, V. M. 1958. OB ULUCSENII PORODNOGO SOSTAVA SREDNE-AZIATSKIH TUGAEV. [IMPROVING THE SPECIES COMPOSITION OF THE CENTRAL ASIAN RIPARIAN WOODLANDS.] Lesn. Hoz. 11(5): 71-2. [Russ.]

Tyszkiewicz, S., and Chmielewski, W. 1961. HYBRYDYZACJA TOPOLI. [HYBRIDIZATION OF POPLARS.] Prace Inst. Bad. Lesn. No. 203, 187 pp. 37 refs.[Pol.russ.e.g.]

A monograph on poplar hybridization in Poland, covering theoretical premises, methods, the breeding stock, and the hybrids obtained. Many of the salient points are given in the four-page English summary.

[U.S.A.: Ntheast. For Exp. Sta.] 1960 HYBRID POPLAR GROWTH RATES CORRELATED WITH ROOT ANATOMY. Extr. From Rep. U.S. For. Serv. Ntheast. For. Exp. Sta. 1959: 18.

Wright, J. W. 1958. POSSIBILITIES OF GENETIC IMPROVEMENT OF THE SOUTHERN BOTTOMLAND HARDWOODS. Proc. 7th For. Symp. La. Sch. For., pp. 27-34. 16 refs.

Includes notes on breeding experiments on *Quercus*, *Populus* (including a tabulated summary of species crosses), and *Fraxinus*.

Zurbin, A I. 1951. VYVEDENIE NOVYH GIBRIDOV TOPOLEI. [NEW POPLAR HYBRIDS.] Trud. Inst. Les. No. 8: 78-84. 13 refs. [Russ.] Includes a list of 50 attempted crossings made by the author in the Ukraine. 1947-49. with notes on methods used and on the hybrids produced.

1951. PREODOLENIE NESKRESCIVAEMOSTI VIDOV TOPOLEI PRI POMOSCI PONIZENNYH TEMPERATUR I TEMNOTY. [OVERCOMING BARRIERS TO CROSSING IN POPLAR SPECIES BY MEANS OF LOWERED TEMPERATURES AND DARKNESS.] Trud. Inst. Les. No. 8: 85-7. [Russ.]

Reports that in small-scale experiments, crossings of *P. nigra* var. *italica* ♀ × *P. lasiocarpa* ♂ and of *P. canadensis* ♀ × *P. laurifolia* ♂ gave a good seed-set when the ♀ cut branches were kept 10 days in darkness at 5-9° C. before being brought into a light greenhouse for pollination.

1961. NOVYE MEZVIDOVYE GIBRIDY TOPOLEJ. [NEW INTERSPECIFIC POPLAR HYBRIDS.] Bot. Z. 46(5): 710-8. 9 refs. [Russ.]

165.42

Dillewijn, C. "an. 1939. CYTOLOGIE EN VEREDELING "AN POPULUS [CYTOLOGY AND BREEDING OF POPULUS.] Ned. Boschb.-Tijdschr. 12 (11): 470-81. Bblg. [D.u.e.]

Fedorova-Sarkisova, O. V. 1946. ON THE CHROMOSOME NUMBER OF CERTAIN WILLOW AND POPLAR SPECIES. C. R. (Dokl.) Acad. Sci. U.R.S.S. 54(4): 353-6. Bblg. [E.]

Smith, E. C. 1943. A STUDY OF CYTOLOGY AND SPECIATION IN THE GENUS POPULUS. J. Arnold Arbor. 24(3): 275-305. Bblg.

165.43

Mackovic, N.V. 1959. EKSPERIMENTALNAJA POLIPOIDIJ A U POPULUS TREMULA L. [EXPERIMENTAL POLYPLOIDY IN P. TREMULA.] Dokl. Akad. Nauk SSSR 126(1): 183-6. 6 refs. [Russ.]

A short account of experiments in the induction of polyploidy in *P. tremula*, and also in *P. balsamifera*, *Euonymus europaeus* and *Quercus robur*, with the aid of colchicine. [No conclusions or growth figures are given.] [Cf. Johnsson, 1953, *P. tremula*, 165.43]

Pesina, K. 1963. [EXPERIMENTAL INDUCTION OF POLYPLOIDY IN POPLAR.] Preslia 35(2): 101-9. 23 refs. [Cz.e.e.]

165.44

May, S. 1963. [THE APPARENT IMPROVEMENT OF POPLAR CLONES WITH GREY AND ROUGH BARK, AS AN EFFECT OF TOPOPHYSIS.] Cellulosa eCarta 14(10): 5-8. 6 refs. [It.it.f.e.g.]

16552

Pauley, S. S. 1950. ECOTYPIC VARIATION IN POPULUS SPECIES. Abstr. in Genetics, Menasha 35(1): 129.

165.52153

Pauley, S. S., and Perry, T. O. 1954. ECOTYPIC VARIATION OF THE PHOTOPERIODIC RESPONSE IN POPULUS. J. Arnold Arbor. 35(2): 167-88. 22 refs.

165.53

Braun, H., and Brendel, G. 1962. [EFFECTS OF PROVENANCE ON RESISTANCE TO DOITHICHA POPULEA AND BIOCHEMICAL DIFFERENCES DISTINGUISHING POPLAR SPECIES *ND VARIETIES.] 1 Naturwissenschaften 49(12): 286. 2 refs. [G.]

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Describes, with details of habitat, distribution **and uses**, the **five species** reported, of which *P. sieboldii*, *P. tremula*, and *P. maximowiczii* are generally held to be comparatively distinctive and indigenous to Japan, **whereas** *P. jezoensis* and *P. koreana* **very possibly are not**. A further report is planned, discussing in detail **the taxonomical treatment of all five species and their full synonymy.**

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1959. NOMENCLATURE AND REGISTRATION [OF POPLAR HYBRIDS OF THE SECTION AIGEIOS]. [Docum.] 10th Sess. Int. Poplar Comm. 1959 No. FAO/CIP/97, 5 pp. [E.]

Includes an annex **by J. Pourtet**, tracing **the history of nomenclature** refuting **recently advanced arguments in favor of Populus canadensis**, and concluding that **the correct name for the group** should be *Populus x euramericana* Guinier [Cf. Boom, 1957, *P. canadensis* to *P. davidiana*, 176.1.]

[International: FAO/Near East Poplar Conf.] 1954. PROPOSALS TO IMPROVE IDENTIFICATION AND CULTIVATION OF POPLAR IN THE NEAR EAST. NOTE OF THE SECRETARIAT. [Pap.] Near East Poplar Conf. 1954, FAO, Rome No. FAO/NEPC/6, 17 pp. [E.]

Includes a table showing native and introduced **species at present cultivated** in different Near Eastern countries, a few notes on **the more important of these**, and suggestions for breeding programs, inventories, and attempts to straighten out **taxonomic difficulties.**

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Limited distribution. Includes **notes on the native and** cultivated poplars, including pests and diseases, uses, etc., and a list of *Salix* species found in Syria.

1962. [NATIONAL PROGRESS REPORTS ON THE GROWING AND UTILIZATION OF POPLARS AND WILLOWS. TUNISIA.] [Docum.] 2nd FAO Near East Poplar Conf., Turkey No. FAO/NEPC/62/9, 5 pp. [F.]

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A review with a bibliography of the chief publications of the last 10 years, classified by main subjects.

1957. BERICHT UBER EINE PAPPELSTUDIENREISE IN DIE TSCHOSCHOSLOVAKISCHE REPUBLIK. [REPORT ON A POPLAR STUDY TOUR IN CZECHOSLOVAKIA.] Forst u. Jagd. Spec. No. Die Pappel II: 59-68. [G.]

Covers distribution of native poplars and **cultivars**, propagation, **sites**, management, utilization, injuries, **research**, particularly breeding, etc., with a description of **the use of poplars and other species** in extensive shelterbelt plantings.

1958. DIE PAPPELWIRTSCHAFT IN UNGARN. [POPLAR GROWING IN HUNGARY.] Holz-Zbl. 84(131): 1674-7. [G.]

A report on a study, discussing natural and cultivated species and varieties, propagation (including irrigated nurseries for white poplar), grafting of grey poplars on white poplar stocks, poplar sites, silvicultural treatment, yields, diseases, utilization, research, etc.

Johnsson, H. 1949. BJORK, ASP OCH POPPEL FRÅN NORDAMERIKA: EN RESEBERÄTTELSE. [BIRCH, ASPEN AND POPLAR FROM NORTH AMERICA: REPORT ON A TOUR.] Medd. Foren. Vaxtforadl. Skogstrad No. 50, 14 pp. 17 refs. [Sw.e.]

In 1947/48 the author traveled in N. Amer. to collect material (scions) for use in Swedish tree-breeding work. The paper contains notes on the distribution and characters of the species and stands from which collections were made, and gives a tabular comparison of climatic data for some N. American and Swedish stations.

[Jugoslavia: Jugoslav. Nac. Kom. Topolu] 1960. RADOVI NA ISTRAZIVANJU TOPOLA. Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu, Belgrade.

No. 1, 1960, contains four articles totalling 126 pages. The series will report on poplar research in Yugoslavia.

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Keresztesi, B. 1962. A MAGYAR NYARFATERMESZTES. [POPLAR GROWING IN HUNGARY.] Mezogazdasági Kiado, Budapest. 589 pp. [Hu.]

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From abstr. in Hung. Agric. Rev. 3(3): 8. 1954. [E.]

1958. CLASIFICACION BOTANICA DE LOS ALAMOS. [BOTANICAL CLASSIFICATION OF POPLARS.] Silvicultura, Uruguay 8(10): 5-44. [Span. e.]

A Spanish translation of the first chapter of the author's book "A Nyarfa" [Cf. Koltay, 1953, *Populus sp.*, 0].

Laitakari, E. 1954. POPPELI—TULEVAISUUDEN PUU. [POPLAR—TREE OF THE FUTURE.] Metsät. Aikak. 1954(1): 11-6. [Fie.] Discusses the genus, its distribution, hybrids, site requirements, growth, utilization, breeding, and research and possibilities in Finland. Species and hybrids successful in Finland are discussed. *P. tremula* × *tremuloides* has given good results. The need to develop a form of *P. tremula* less subject to decay is stressed. [From author's summary.]

Larsen, C. M. 1953. POPPEL OG ASP NU OG I FREMTIDEN. [POPLAR AND ASPEN, NOW AND IN THE FUTURE. [WITH DISCUSSION.]] Dansk Skovforen. Tidsskr. 38(5): 355-404. 45 refs. [Dan.]

A lecture reviewing the species and hybrids, their silviculture, growth and diseases, wood properties, and breeding (with special reference to work in progress at Grammont).

1956. LE RÔLE DES STOMATES DANS LA DESCRIPTION DES RACES ET DES CLONES D'ARBRES FORESTIERS. [THE ROLE OF STOMATA IN THE DESCRIPTION OF RACES AND CLONES OF FOREST TREES.] [Docum.] 12th Cong. Int. Union For. Res. Organ., Oxford 1956 No. IUFRO/56/22/104, 3 pp. [F.]

Briefly describes investigations on length and distribution of stomata on poplar leaves, made at the Institut de Populiculture, Grammont, Belgium, and tabulates data for *Populus tremula*, *P. tremuloides* (and their crosses), *P. grandidentata*, *P. nigra*, *P. deltoides* and *P. trichocarpa*. The diagnostic value of this character is established.

Lee, C. B. 1955. THE IDENTIFICATION OF GENUS POPULUS IN KOREA BY WINTER TWIGS AND BUDS. Coll. Theseon (Sci. Nat.) Univ. Seoul No. 2: 75-80. 7 refs. [E.kor.]

A key, with descriptions and drawings, to eight species and two hybrids found in Korea.

Lesare. 1897. NOTES ON SOME VARIETIES OF POPLAR. Bull. Soc. For. Belg. 4: 40.

Makowiecki, A. 1930. DEUX PEUPLIERS INTERESSANTS. Roczn. Dendrol. Polsk. Tow. Bot., Warsz., No. 3, p. 201. [Pol.]

Mathey. 1925. NOTES ON VARIOUS KINDS OF POPLAR IN FRANCE. Bull. Corn. For., Paris No. 29, p. 451.

Mathiesen, A. 1953. UBER DIE ASPEN UND ANDERE POPULUS-ARTEN, WELCHE WILDWACHSEND IN DER PROVINZ ONTARIO VORKOMMEN. [ASPENS AND OTHER POPLAR SPECIES OCCURRING WILD IN THE PROVINCE OF ONTARIO.] Zbl. Ges. Forst- u. Holzw. 72(1): 60-5. 5 refs. [G.]

A description of *Populus tremuloides*, *P. grandidentata*, *P. balsamifera*, and *P. deltoides*, their natural habitats, regeneration, diseases, associated species, and silvicultural treatment.

Meelker. 1930. POPLARS OCCURRING IN HOLLAND. Forstl. Rundschau 3: 477.

Meunier, G. 1947. LES PEUPLIERS FRANCAIS. [FRENCH POPLARS.] Les techniques du bois No. 4, 35 pp. [F.] Bblg. Editions de la Revue du Bois et de ses Applications, Paris.

Meyer-Uhlenried, K. -H. 1959. BIBLIOGRAPHIE DES INTERNATIONALEN PAPPELSCHRIFTUMS. BAND 3, 1955-1958. [BIBLIOGRAPHY OF INTERNATIONAL LITERATURE ON POPLARS. VOL. 3, 1955-58.] Forstbotanisches Inst. Univ. Freiburg, Freiburg/Brag. 206 pp. [G.]

Mimeographed. Contains 1619 titles. [Cf. Volkmann and Meyer-Uhlenried, 1954, this subject classification.]

Morgeneyer, [W.] 1960. LANDFORSTMEISTER HERBERT GUNTHER. [HERBERT GUNTHER, CHIEF CONSERVATOR OF FORESTS DIED 28 MARCH 1960.] Arch. Forstw. 9(7): 665-9. 36 refs. [G.]

This obituary of the director of the Institut für Forstwissenschaften, Tharandt, deals mainly with his pioneer work in poplars and willows. Of his publications here listed, 26 out of 36 obviously deal with poplars.

Morton. 1920. THE POPLAR TREES OF CANADA. Canad. For. Mag. 16: 573-5.

Musegjan, A. M. 1960. TOPOĽJA KAZACHSTANA. [THE POPLARS OF KAZAKHSTAN.] Trud. Alma-Atinskogo Bot. Sada, Alma-Ata No. 5: 63-82. 13 refs. [Russ.]

Descriptions of the 11 introduced, and 15 naturally occurring, species of poplar in Kazakhstan.

Nakai, T. 1939. NOTULAE AD PLANTAS ASIAE ORIENTALIS. 8 & 9. [Notes on plants of Eastern Asia.] J. Jap. Bot. 15(7:9): 401-21; 523-41. Biol. Abstr. 15: 15314. 1941.

[Netherlands: Landbouwhogeschool.] 1960. LIST OF POPLARS IN THE NURSERIES OF THE INSTITUTE OF FORESTRY RESEARCH, DIVISION OF SILVICULTURE OF THE AGRICULTURAL UNIVERSITY, WAGENINGEN. Landbouwhogeschool, Wageningen. 15 pp [E.Du.]

[Netherlands: Ned. Boschb.-Tijdschr.] 1960. DE POPULIER. [THE POPLAR.] Ned. Boschb.-Tijdschr. 32(5/6): 143-234. [Du.]

Peace, T. R. 1954. INTERNATIONAL CODE OF NOMENCLATURE FOR CULTIVATED PLANTS. Rep. 7th Sess. Int. Poplar Comm., Germany, pp. 39-42.

Piccarolo, G. 1951. LA PIOPICOLTURA NELLA VALLE PADANA. [POPLAR-GROWING IN THE PO VALLEY.] Ital. Agric. 88(6): 341-52. [It.]

Silvicultural methods and notes on genetics and taxonomy.

1959. IL SERVIZIO DI RICONOSCIMENTO E DI CERTIFICAZIONE PER GARANZIA NELLA PIOPICOLTURA INDUSTRIALE. [A SERVICE FOR IDENTIFICATION AND CERTIFICATION IN COMMERCIAL POPLAR GROWING.] Cellulosa e Carta 10(8): 5-14. [It.f.e.g.] Surveys the existing difficulties and confusion in the field of poplar breeding in Italy in respect to the identification of species and nomenclature of clones, and gives a draft scheme for official regulation as requested by the International Poplar Commission.

Podhorski, I. 1951. UZGOJ TOPOLA. [POPLAR GROWING.] [Publ.] Inst. Sum. Istraz., Zagreb No. 6, 67 pp. 39 refs. [Croat.]

Polster, H., and Reichenbach, H. 1958. BESTIMMUNG VON BLATT-FLÄCHEN IN SITU DURCH LINEARE MESSUNGEN. [THE DETERMINATION OF LEAF AREAS IN SITU BY LINEAR MEASUREMENTS.] Biol. Zbl. 77(3): 265-77. 17 refs. [G.g.]

Polycarpou, A. 1954. STATEMENT PREPARED FOR THE NEAR EAST POPLAR CONFERENCE, DAMASCUS, APRIL 1954. Cyprus For. Dep., Nicosia. 10 pp.
Covers statistical data, *policy*, silviculture, pests and diseases, logging and utilization.

Pourtet, J. 1950. DÉTERMINATION ET UTILISATION DES PEUPLIERS NOIRS CULTIVÉS EN FRANCE. [IDENTIFICATION AND USE OF THE BLACK POPLARS GROWN IN FRANCE.] Rev. For. Franc. 1950(2): 53-65. [F.] Includes a *key* for identification, *notes on silvicultural* characters and uses, and recommendations for choice of species for different *parts of France*.

———. 1952. LES PEUPLIERS EN YOUGOSLAVIE. [POPLARS IN YUGOSLAVIA.] Rev. For. Franc. 1952(12): 819-26. [F.] A brief *account of the poplars* occurring naturally, and cultivated, in Yugoslavia. The native species include *two* subspecies of *P. alba*, a hybrid of *P. alba* × *P. tremula* and *P. nigra*.

Quairiere, A. L. 1958. LE PEUPLIER EN BELGIQUE. [POPLARS IN BELGIUM.] Ann. Gembl. 64(1): 16-46. [F.] A *summary of information* with special reference to Belgian conditions and covering classification, characteristics, *choice of species, pests and diseases, methods of raising*, tending of plantations, and costs and returns.

Rabouille. 1930. NOTE ON THE POPLAR IN FRANCE. Rev. Eaux For. 68: 534.

Ragonese, A. E., and Rial Alberti, F. 1959. RESEÑA SOBRE CULTIVO Y MEJORAMIENTO DE ALAMOS Y SAUCES EN LA REPUBLICA ARGENTINA. [REVIEW OF THE CULTIVATION AND IMPROVEMENT OF POPLARS AND WILLOWS IN ARGENTINA.] [Docum.] 10th Sess. Int. Poplar Comm. No. FAO/CIP/95L Add. 1, 27 pp. 84 refs. [Span.] The review, which is amply documented, *includes a survey of species and hybrids cultivated in Argentina, methods of raising* and establishing willow plantations, probable yields, pests and diseases of *both poplar and willow, and work achieved* in breeding.

Rehder. 1931. NOTES ON NEW SPECIES OF POPULUS. J. Arnold Arbor. 12: 63.

——— and Kobuski. 1932. POPULUS SPP. OF NORTHWEST CHINA AND NORTHEAST TIBET. J. Arnold Arbor. 13: 385.

Rettelbach. 1956. BAYERN UND DIE PAPPEL. [THE POPLAR IN BAVARIA.] Holz-Zbl. 82(83): 1033-4. [G.]

A report on the *Annual Conference of the German Poplar Society, including data on potential sites and actual plantings, a paper (followed by an excursion) on grey poplars in the Danubian bottom lands, (Krembs) describing the Ingolstadt grey poplar, a P. tremula x P. alba hybrid, site conditions, regeneration, diseases, etc.: also on afforestation with poplars and other spp. on waste land (dismantled munitions factory and rubble mounds).*

Rojas Rojas, J. M. 1961. EL CHOPO EN GRANADA. [THE POPLAR IN GRANADA.] Montes, Madrid 17(99): 267-77.

A *detailed general account, with volume and yield tables, and data upon which to base rotations for roundwood and sawtimber for clones of Populus X euroamericana (cv. "chopo negro de Granada" and cv. "chopa de Granada") and Populus nigra (cv. "chopo castellano" or "blanquilla") as found in the R. Genil vicinity.*

Rol, R. 1951. LES PEUPLIERS ET LES PRINCIPALES ESSENCES FORESTIERES DE L'EST DES ETATS-UNIS. RAPPORT DE MISSION MAI-JUIN 1950. [THE POPLARS AND THE PRINCIPAL FOREST TREE SPECIES OF THE EASTERN UNITED STATES. REPORT ON THE [O.E.E.C.] MISSION MAY-JUNE 1950.] Ann. Ec. Eaux For. Nancy 12(2): 527-637. 49 refs. [F.g.e.]

The main object of the mission was to *study the poplars in their natural habitats, and the fast growing artificial hybrids made by American breeders; the latter are reported on unfavorably.*

———. 1955. NOTE SUR LES PEUPLIERS DU CACHEMIRE. [NOTES ON THE POPLARS OF KASHMIR.] [Pap.] 8th Sess. Int. Poplar

Comm., Madrid, 1955. No. FAO/CIP/179-G, 3 pp. [F.] Limited distribution. Tentatively identifies the *following: Populus ciliata, P. longifolia, P. suaveolens, P. thevestina*, and *P. triloba*, the last named large trees growing naturally *at 2,500 m.* alt. at the lower limit of *the Himalaya cedar forest. All others are mostly young, their form spoilt by frequent lopping.*

Rouleau, E. 1945. A NECESSARY TRANSFER IN POPULUS (TUREN-GA). Rhodora 47 (563): 362.

Sabeti, H. 1955. LE PEUPLIER EN IRAN. [THE POPLAR IN PERSIA.] Imp. Bank, Bazargani, Iran. 96 pp. [Pers.f.]

Describes the species grown in Persia (Populus euphratica, P. alba, P. hybrida M.B., P. nigra, P. nigra var. italica), their silvicultural characters, timber properties and uses, and lists insect pests and diseases. Photographs (78) have French legends.

Schenkenberg van Mierop, H. W. 1951. DE JAARKAP VAN POPULIEREN. [THE ANNUAL FELLINGS OF POPLAR.] Houthandel, Schiedam 3(50): 483-5. Abstr. in Ned. Boschb.-Tijdschr. 23 (5): 158.9. 1951. [Du.]

Gives figures to *show the volume of poplar and fellings in Holland during and since the war.*

Schreiner, E. J. 1959. PRODUCTION OF POPLAR TIMBER IN EUROPE AND ITS SIGNIFICANCE AND APPLICATION IN THE UNITED STATES. Agric. Handb. U. S. Dep. Agric. No. 150, 124 pp.

Describes in some detail species commonly grown, breeding and selection, nursery practice, site and soil requirements, planting, management, protection, growth and yield, and properties and utilization of wood.

——— and Stout, A. B. 1934. DESCRIPTION OF TEN NEW HYBRID POPLARS. Bull. Torrey Bot. Cl. 61: 449-60.

Schwerin. 1928. FEMALE FASTIGATE POPLARS. Mitt. Dtsch. Dendrol. Ges. 4: 327.

Sim. 1920. CULTIVATED TIMBER TREES (SOUTH AFRICA). S. Afr. J. Ind. 3: 782.

[Spain: Corn. Nac. Chopo Madrid] 1957. MEMORIA 1957. [REPORT FOR 1957.1 Mem. Corn. Nac. Chopo, Madrid. 122 pp. 4 pp. of refs. [Span.]

A report in four parts: (1) *Work of the Spanish National Poplar Commission in 1957, including 5-year plans of work and research, and a review of the present situation and possibilities for expansion in eight provinces, (2) projected work for 1958, (3) Spanish legislation governing the cultivation and exploitation of poplars, and (4) a list of Spanish publications on poplar up to the time of the report.*

———. 1958. MEMORIA 1958. [REPORT FOR 1958.1 Mem. Corn. Nac. Chopo, Madrid. 163 pp. 4 refs. [Span.]

Reports on work achieved during 1958, the present situation, plans for 1959, and gives individual data on work in 22 provinces.

———. 1959. MEMORIA 1959. [REPORT [ON POPLARS] FOR 1959.1 Mem. Corn. Nac. Chopo, Madrid. 81 pp. [Span.]

Reviews the year's activities for 1959, and includes appendices giving the text of a *report* to the International Poplar Commission, reports on trial *plots in three different provinces, results obtained with experimental clones in Leon Forest District, and the present situation and outlook in seven Spanish provinces.*

Spalek, V. 1951. SYSTEMATIKA A SLECHTONI TOPOLU. [SYSTEMATICS AND BREEDING OF POPLARS.] Čsl. Les 31(21): 466-70. [Cz.]

Stefanov, B., and Cikova, E. 1957. ZA CUZDOZEMNITE VIDOVE TOPOLI, OTGLEZDANI V BULGARIJA. [EXOTIC POPLAR SPECIES CULTIVATED IN BULGARIA.] Izv. Inst. Gorata Balg. Akad. Nauk., Sofia No. 2: 383-96. 11 refs. [Bulg.russ.g.]

Stegmann, G. 1959(1949). ANBAU UND VERWERTUNG DER PAPPEL IN WESTDEUTSCHLAND. [CULTIVATION AND UTILIZATION OF POPLARS IN WEST GERMANY.] Holz-Zbl. 85(145). [G.]

Summarizes papers read at a meeting of the utilization section of the German Poplar Commission on: Recent experience with poplars in the particle board and related industries (Klauditz); targets and limits of poplar growing in W. Germany (G.A. Schutze); high quality poplar pulp by the calcium-bisulphite process (T. Krause); the semichemical pulping of poplar and

willow grown outside the forest in *Schleswig-Holstein* [containing much reaction wood] (*K. F. Patt*); poplar assortments (*Ulrich*); and poplar yield studies (*Volkman*).

Tabatabai, M. 1958. *PAPELANBAU IN IRAN*. [POPLAR CULTIVATION IN IRAN.] *Silvae Genet.* 7(6): 169-81. 45 refs. [G.g.e.f.]

Tronco, G. 1956. IL PIOPPO—QUESTO SCONOSCIUTO! [POPLAR—THE UNKNOWN.] *Ital. Agric.* 93(1): 63-86. [It.]

A general account of poplar breeding, *silviculture* and utilization in Italy. "White" Canadian poplar hybrids, particularly clone 488, are recommended for moist, fertile soils new to *poplar* growing, and black poplar hybrids [clones 154 and 214] for *less fertile* soils.

Turnbull, G. 1938. POPLARS. VARIETIES GROWN IN GREAT BRITAIN. *J. Land Agents' Soc.* 37(5): 243-45.

Uphof. 1922. POPLARS OF SOUTHWEST UNITED STATES. *Mitt. Dtsch. Dendrol. Ges.* 32: 172.

Vasil'ev, I. I. 1938. NOTES ON THE POPLARS OF THE FAR EASTERN REGION. *Bull. Far East. Br. Acad. Sci. USSR* 28(1): 101-07. [R.e.] *Plant Sci. Lit.* 7(26): 20.

Vicioso, O. 1951. SALICACEAE DE ESPAÑA. [SALICACEAE OF SPAIN.] [Bol.] *Inst. For. Invest. Exp. Madrid* 22(57), 131 pp. [Span.]

A botanical study of the Spanish *Populus* and *Salix* spp. with keys for their identification.

Vill, G. 1934. UBER PAPPELN. [ON POPLARS.] *Dtsch. Forstw.* 16: 153-7, 876-7 [G.]

Vinconneau, V. -R. 1949. LES PEUPLIERS DU POITOU ET DES CHARENTES ET LE CONGRES REGIONAL DUPEUPLIER A NIORT, (12-14 MAI 1948). [THE POPLARS OF THE POITOU-CHARENTE REGION AND THE REGIONAL POPLAR CONFERENCE AT NIORT, 12-14 MAY, 1948.] *Rev. For. Franc.* No. 2: 57-99. 19 refs. [F.]

Includes a *short* historical account and a description of the "Blanc du Poitou," a *local* variety of *Populus serotina*.

Volkman, J. H. 1958. WELCHE HOLZERTRAGE SIND AUS DER STEIGERUNG DES PAPPELANBAUS IN WESTDEUTSCHLAND ZU ERWARTEN. [HOW MUCH WOOD MAY BE EXPECTED FROM THE INCREASE POPLAR GROWING IN WEST GERMANY?] *Allg. Forstzeitschr.* 13(38): 533-6. 12 refs. [G.]

— and Meyer-Uhlenried, [K. -H.] 1954. BIBLIOGRAPHIE DES INTERNATIONALEN PAPPELSCHRIFTTUMS. [BIBLIOGRAPHY OF INTERNATIONAL LITERATURE ON POPLARS.] *Nat. Pappelkommission, Kronprinzenstr.* 15, Bonn. 202 pp. [G.]

In addition to the main list of 1,268 titles arranged according to the Oxford System of Decimal Classification, the *work* contains a concordance of the main heads of the system with the *Flury* System and four appendixes: (1) the bibliography from *S. S. Pauley's "Forest tree genetics research: Populus L"*; (2) subject index; (3) authors *index*; and (4) list of periodicals and serials cited, with abbreviations. Special efforts were made to cover the literature as completely as possible from 1951 on; references before that year are taken from the more comprehensive of recent works on poplars.

— and Meyer-Uhlenried, [K. -H.] 1955. BIBLIOGRAPHIE DES INTERNATIONALEN PAPPELSCHRIFTTUMS. Band 2, 1954. [BIBLIOGRAPHY OF INTERNATIONAL LITERATURE ON POPLARS. VOL. 2, 1954.] *Nat. Pappelkommission, Verwertungsausschuss, Braunschweig/Freiburg i. Br.* 146 pp. [G.]

Contains 620 titles and a *synopsis of Kollmann's* classification of wood utilization and the Oxford System of Decimal Classification for Forestry.

Vucetic, J. S. 1958. O SAVREMENOJ NOMENKLATURI TOPOLA. [CONTEMPORARY POPLAR NOMENCLATURE.] *Topola, Beograd* No. 5: 333-56. 19 refs. [Serb.f.]

Describes recent activities of the *FAO International Poplar Commission*, and lists poplar species, varieties and hybrids under their scientific names, giving where it exists, the *Yugoslav* name, and occasionally also the French, German, or English name, with notes on distribution.

Vujic, P. 1958. TOPOLE U MADARSKOJ. [POPLARS IN HUNGARY.] *Topola, Beograd* No. 8: 680-6. 5 refs. [Serb.] [Cf. Joachim,

1958, this subject classification.]

Has *short* sections on: selection of planting material, methods of raising plantations, damage by *pests* and disease, and utilization of poplar *wood*.

Wettstein, W. von. 1952. DIE PAPPELKULTUR. [POPLAR CULTIVATION.] *SchrReihe Ost. Ges. Holzforsch.* No. 5, 52 pp. 22 refs [G.] Contains chapters on: the economic importance of poplar; choice of site; cultivation; propagation; breeding; planting; description of *species*; and pests.

White, W. W. 1949(1951). NATIVE COTTOWOODS OF MONTANA. *Proc. Mont. Acad. Sci., Missoula* 9: 33-9. 8 refs.

Describes *Populus acuminata*, *P. angustifolia*, *P. balsamifera*, *P. balsamifera* *candicans*, *P. sargentii*, and *P. trichocarpa hastata*.

Woodward. 1933. NEW HYBRID POPLARS FOR REAFFORESTATION IN NEW YORK. *J. N. Y. Bot. Gdn.* 34: 263-70.

Ye, P. C. 1955. [METHODS OF PROPAGATING [CHINESE] POPLARS.] *For. Sci., Peking* 1(1): 37-46. [Chin.]

Zabka, J. 1939. ON THE NOMENCLATURE OF THE POPLARS FROM THE TAXONOMICAL AND GENETICAL POINTS OF VIEW. *Lesn. Prace* 18(12): 586-91. Bblg. [Cz.g.]

18 PLANT ECOLOGY

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Bruckmann, J. J. 1954. OBSERVACIONES SOBRE EL RITMO VEGETATIVO ANUAL DE ALGUNOS ALAMOS EN EL DELTA DEL PARANA. [THE YEARLY GROWTH RHYTHM OF POPLARS IN THE PARANA DELTA.] *Rev. Argent. Agron.* 21(4): 215-30. [Span.]

Comte. 1927. THE POPLARS AND THEIR VALUE SILVICULTURALLY. *J. For. Suisse* 78: 179.

Fenaroli, L. 1953. NOTE SU L'ECOLOGIA E LA DISTRIBUZIONE DEI PIOPI IN ITALIA. [NOTE ON THE ECOLOGY AND DISTRIBUTION OF [INDIGENOUS] POPLARS IN ITALY.] *Suppl. to Ann. Sper. Agric.* 7(2), 36 pp. [It.ite.]

Gives distribution in Italy and ecological characters of 17 indigenous *species*, varieties, and hybrids, with numerous drawings to illustrate *leaf* morphology.

Fenaroli, L. 1945. NOTE SULL'ECOLOGIA E DISTRIBUZIONE DEI PIOPI IN ITALIA. [NOTES ON THE ECOLOGY AND DISTRIBUTION OF POPLARS IN ITALY.] *Bosco*, Feb. 1945: 2. [It.]

Guse. 1888. SILVICULTURAL IMPORTANCE AND DISTRIBUTION OF POPULUS IN RUSSIA. *Allg. Forst- u. Jagdztg.* 64: 439-443.

Houtzagers, G. 1937. THE GENUS POPULUS AND ITS SIGNIFICANCE IN SILVICULTURE. H. Veenman & Zonen, Wageningen. 366 pp. Bblg. [Due.]

Llensa de Gelcen, S. 1943. ESTUDIO BOTANICO-FORESTAL DE LOS CHOPOS (GENERE POPULUS) ENSAYO MONOGRAFICO SOBRE LOS CHOPOS DE LA CUENCA INFERIOR DEL RIO TORDERA. [A SILVICULTURAL AND BOTANICAL STUDY OF POPULUS. PRELIMINARY MONOGRAPH ON THE POPLAR STANDS OF THE LOWER BASIN OF THE RIVER TORDERA.] *Anales de la Escuela de Peritos Agricolas y Superior de Agricultura y de los Servicios Tecnicos de Agricultura, Barcelona* 3(1/4): 131-295. 53 refs. [Span.]

Marcet, E. 1952. ZUM OKOLOGISCHEN VERHALTEN VERSCHIEDENER PAPPELSORTEN. [THE ECOLOGICAL BEHAVIOR OF SEVERAL KINDS OF POPLAR.] *Schweiz. Z. Forstw.* 103(11): 425-31. [G.]

Matyuk, I. S. 1940. THE GROWTH OF POPLARS UNDER THE CONDITIONS PREVAILING IN THE STEPPE. *Lesn. Hoz.* 1940(7): 41-4. Bblg. [Russ.]

Sibille. 1925. THE POPLAR. *Bot. Abstr.* 14: 1080.

Sudworth, G. B. 1934. POPLARS, PRINCIPAL TREE WILLOWS AND WALNUTS OF THE ROCKY MOUNTAIN REGION. *Tech. Bull. U. S. Dep. Agric.* No. 420, 112 pp.

Wroblewski, A. 1937. NAJSZYBCIEJ ROSNACE TOPOLE I ICH WZYTECZNOSC. [FAST-GROWING POPLARS AND THEIR USEFULNESS.] *Roczn. Nauk Rol.* 41: 330-7. Bblg. [Pol.f.]

181.1

Halliday, W. E. D., and Brown, A. W. A. 1943. THE DISTRIBUTION OF SOME IMPORTANT FOREST TREES IN CANADA. *Ecology* 24(3): 353-73. Bblg.

Regnier, R. 1956. DISTRIBUTION GEOGRAPHIQUE ET ORIGINE DES POPULUS. [GEOGRAPHICAL DISTRIBUTION AND ORIGIN OF POPLARS.] *Proc. 8th Int. Bot. Cong., Sect. 3-6*: 184-6. [F.] Short notes on range and evolution.

181.21

Barner, J. 1954. EINE SELEKTIONSMÖGLICHKEIT VERSCHIEDEN LICHTREAGIBLER PAPPELKLONE. [THE POSSIBILITY OF SELECTING POPULAR CLONES WITH DIFFERENT PHOTOTROPIC REACTION.] *Abstr. in Z. Forstgenet.* 3(6): 135. [G.]

Hoffmann, D. 1953. DIE ROLLE DES PHOTOPERIODISMUS IN DER FORSTPFLANZENZUCHTUNG. [PHOTOPERIODISM IN TREE BREEDING.] *Z. Forstgenet.* 2(2): 44-7. [G.g.]

Perry, T. O. 1953. THE GENETICS OF THE PHOTOPERIODIC RESPONSE IN POPULAR TREE SPECIES. *Abstr. in Genetics*, Madison 38: 681-2. (1953 meeting, *Genetics Soc. of Amer.*)

Veen, R. van der. 1951. INFLUENCE OF DAYLENGTH ON THE DORMANCY OF SOME SPECIES OF THE GENUS POPULUS. *Physiol. Plant., Copenhagen* 4(1): 35-40. 2 refs. [E.]

181.22

Rostovcev, S. A. 1959. MOROZOSTOJKOST TOPOLEJ V USLOVIJAH MOSKOVSKOJ OBLASTI. [FROST-HARDINESS OF POPLARS IN THE MOSCOW REGION.] *Lesn. Hoz.* 12(6): 22-6. [Russ.]

A general account of trials with rooted cuttings. Some 60 species, hybrids and clones, are listed as being highly frost-hardy in the area.

181.3

Aichinger, E. 1957. DIE VEGETATIONSKARTIERUNG ALS GRUNDLAGE FÜR DIE ÜBERFUHRUNG VON MINDERWERTIGEN ERLAUAUWÄLDERN IN HOCHWERTIGE AUWIRTSCHAFTSWÄLDER. [SITE MAPPING AS A BASIS FOR THE CONVERSION OF BOTTOMLAND ALDERWOODLANDS OF LOW PRODUCTIVITY INTO HIGH-YIELDING PRODUCTION FORESTS.] *Allg. Forstztg.* 68(7/8): 91-2. 6 refs. [G.]

Giulimondi, G. 1959. INFLUENZA DI ALCUNE ANOMALIE STRUTTURALI DEL TERRENO SULL' ACCRESCIMENTO DEL PIOPPO IN VIVAIO. [EFFECT OF SOME ANOMALIES OF SOIL STRUCTURE ON THE GROWTH OF POPULAR IN THE NURSERY.] *Pubbl. Cent. Sper. Agric. For., Roma* 2: 223-32. 9 refs. [It. it. e. e.]

Hilf, H. H. 1956. STANDORTSANSPRÜCHE VON PAPPELSORTEN. [SITE REQUIREMENTS OF POPULAR VARIETIES.] *Holzzucht, Reinbek* 10(5): 37-8. 2 refs. [G.]

Chiefly a discussion of method, advocating a "clinical" approach to practical questions, which bases recommendations on practical experience as viewed in the light of fundamental research, in anticipation of scientifically established results. The author compares his own tentative scheme for allocating varieties to site types [cf. *Hilf and Rohmeder*, 1951, *Populus* sp., 232.] with a revised scheme based on H. F. Joachim's classification [cf. *Joachim*, 1953, *Populus* sp., 181.36].

Jaro, B. 1960. ANYARAK TERMOHELYI IGENYE. [THE SITE DEMANDS OF POPLARS.] *Erdo* 9(1): 32-40. [Hu. russ. g.]

Since the climate of Hungary is generally suitable, the author considers the demands of different species of poplar on the physical, chemical, and hydrological properties of the soil. Limiting values of single factors are not critical. Recommendations for the heavier soils, classified by type and thickness of the fertile layer, are tabulated.

Marcet, E. 1960. MODELLVERSUCH ZUR FRAGE DER SPEZIFISCHEN EIGNUNG BESTIMMTER PAPPELSORTEN FÜR NICHT OPTIMALE BODEN. [PILOT TRIALS TO INVESTIGATE THE SPECIFIC ADAPTABILITY OF POPULAR VARIETIES TO INFERIOR SOILS.] *Silvae Genet.* 9(4): 93-101. 8 refs. [G. g. e. f.]

Raschke, G. 1959. PAPPELANBAU AUF GRENZSTANDORTEN? [GROWING POPLARS ON MARGINAL SITES.] *Holzzucht, Reinbek* 13(3): 17-9. 9 refs. [G.]

Discusses German literature on experience with various species on sites with different unfavorable conditions, giving some data on the Reinbek trials with hybrid varieties. There, as elsewhere, the "Oxford" poplar had done very well on an originally rather heavy, acid poor soil, reaching 12 m. in height and 20 cm. d.b.h. at 7 years.

Schreiner, E. J. 1940. INHIBITING EFFECT OF SOD ON THE GROWTH OF HYBRID POPLAR. U.S. Forest Serv. Northeast. For. Exp. Sta. Occ. Pap. No. 8, 11 pp.

1945. HOW SOD AFFECTS ESTABLISHMENT OF HYBRID POPLAR PLANTATIONS. *J. For.* 43(6): 412-27. Bblg.

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Krolikowski, L., and Strzelec, Z. 1961. [GROWTH OF ALNUS GLUTINOSA, A. INCANA, POPULUS TREMULA AND P. × BEROLINENSIS WITH DIFFERENT GROUND-WATER LEVELS IN SANDY SOILS.] *Roczn. Gleboznawcze, Warsz.* 10 (Suppl.): 724-5 [Pol.] After 3 years, with groundwater at ca. 70 cm. A. glutinosa did best, then P. × berolinensis and A. incana; with groundwater at ca. 130 cm., A. incana did best, then P. × berolinensis and A. glutinosa.

-1'81.311

Polster, H., and Reichenbach, H. 1957. EIN VERFAHREN ZUR PROGNOSE DER VITALEN DURRESISTENZ DURCH ERMITTLUNG DES STOMATAREGULATIONSVERMÖGENS: ABGESCHNITTENER PFLANZENSPROSSE. [A METHOD OF FORECASTING WILT-RESISTANCE BY ASSESSING THE ABILITY OF CUTTING TO REGULATE STOMATAL ACTIVITY.] *Biol. Bblg.* 76(6): 700-21. 28 refs. [G. g.]

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Dabrowski, T. 1957. SIEDLISKA TOPOLOWE. [POPULAR SITES.] *Las Polski, Warsz.* 31(9): 5-7. [Pol.]

Krolikowski, L., and Baranski, R. 1961. [THE GROWTH OF SOME POPULUS SPECIES ON DIFFERENT SOILS. *Roczn. Gleboznawcze, Warsz.* 10 (Suppl.): 717-8. [Pol.] Tabulates data on the d.b.h., height, and mortality of 10 different poplar species and hybrids on three sites differing in soil type and nutrient status.

Mraz, K. 1962. NEKTERE POZNATKY O VHODNOSTI PUD PRO PESTOVANI TOPOL. [SOME DATA ON THE SUITABILITY OF SOILS FOR POPULAR RAISING.] *Prace Vyzkum. Ust. Lesn. CSSR* No. 24: 73-103. 56 refs. [Cz. russ. g. e.]

Nowakowski, A. 1957. O NIEKTORYCH CZYNNIKACH GLEBOWYCH WARUNKUJACYCH PRZYDATNOSC SIEDLISK TOPOLOWYCH. [SOME SOIL FACTORS DETERMINING THE SUITABILITY OF SITES FOR POPLARS.] *Las Polski, Warsz.* 31(7): 11-2. [Pol.]

Pavser, M. 1957. TLA TOPOLOVIH RASTISC V SLOVENIJI. [SOILS OF POPULAR SITES IN SLOVENIA.] *Gozd. Vestn.* 15(2/3): 71-81. [Sloven.]

Popovic, B. 1956. PRILOG POZNAVANJU TLA BEHREMAGINICE KAO EKOLOGSKOG FAKTORA KODUZGOJATOPOLA. [THE SOIL ON MT. BEHREMAGINICA AS AN ECOLOGICAL FACTOR IN POPULAR CULTIVATION.] [Publ.] *Inst. Sum. Drvnu Industr., Sarajevo* 3(3), 23 pp. 26 refs. [Croat. g. e.]

Data are given on the structure and the physical, mechanical, and chemical properties of the soil on Mt. Behremaginica, Bosnia, which is near a center of the cellulose industry. Recommendations are made for applying fertilizer, but in general the author does not consider the site favorable for growing [poplar].

181.33

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Richard, F., and Fehr, R. 1954. PHYSIKALISCHE BODENEIGENSCHAFTEN EINIGER PAPPELSTANDORTE IM SCHWEIZERISCHEN MITTEL-LAND. [THE PHYSICAL CHARACTERISTICS OF THE SOILS IN SOME POPLAR STANDS ON THE SWISS CENTRAL PLATEAU.] Mitt. Schweiz. Anst. Forstl. Versuchsw. 31(1):59-101. 13 refs. [G.g.f.] Analyzes density, pore volume, distribution of pore sizes, humus and C content.

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Sumakov, V.S. 1963. [FAST-GROWING STANDS AND SOIL FERTILITY.] Lesn. Hoz. 16(7):60-5. [Russ.]

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2 SILVICULTURE

22 SILVICULTURAL SYSTEMS. CONSTITUTION AND COMPOSITION OF STANDS: FORMS OF STAND

222.1

Ophove, C. H. d'. 1960. LE PEUPLIER DANS UN TAILLIS. [POPLAR [INTRODUCED TO FORM STANDARDS] IN COPPICE.] For. France No. 93: 6-7. [F.]

228 CONSTITUTION AND COMPOSITION OF STANDS; FORMS OF STAND

Vincent, G. 1949. LASYLVICULTURE ET LES ESSENCES FORESTIERES A CROISSANCE RAPIDE. [FORESTRY AND QUICK-GROWING FOREST SPECIES.] Schweiz. Z. Forstw. 100(7/8): 309-25. 27 refs. [F.g.]
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23 REGENERATION AND FORMATION OF STANDS

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231 NATURAL REGENERATION

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Ford, H. F., and Snow, A. G., Jr. 1954. SUMMER IS THE BEST TIME TO THIN HYBRID POPLAR PLANTATIONS. U. S. For. Serv. Northeast. For. Exp. Sta. Res. Note No. 40, 2 pp.
Coppice shoots from young (2-3 year) hybrid *poplars* removed in summer by *axe-or* machette-felling were fewer and only *about* half the size of those removed in winter.

232 ARTIFICIAL REGENERATION

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Describes and illustrates some Italian tractors and how they are used for planting, felling, and extraction in Italian poplar *stands*.

Hilf, H. H. 1950. PAPPELKULTURTECHNIK: EINE UBERSICHT UBER DEN STAND DER VERMOHRUNGSTECHNIK, ANZUCHTECHNIK UND ANBAUTECHNIK. [POPLAR PLANTATION TECHNIQUE: A REVIEW OF THE PRESENT POSITION OF PROPAGATION, NURSERY AND PLANTING TECHNIQUES.] Forstarchiv 21(1/3): 2-9. 74 refs. [G.g.]

[Portugal: Serv. Flor. Aquic.] [n.d.] OCHOPO. [POPLAR.] Servico de Melhoramentos Florestais, Direcção Geral dos Serviços Florestais e Aquícolas, Lisboa. 12 pp. 13 refs. [Port.]
Presents in simple diagrammatic form, with captions, instructions for raising poplars from cuttings, planting out, pruning and protection, with some information on the clones cultivated in the Portuguese Forest Service nurseries.

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Gives results of trials. On moist rich soils *populus x berolinensis*, and *P. balsamifera* were best, giving an *m.a.i.* of ca. 45 cu. m./ha. On drier, poorer soil on S.E. *slopes*, and on poor eroded soil *P. simonii* and "Moscow poplar" gave the *best results*. The *other* varieties tried on some *or all of the sites* were *P. x canadensis*, *P. suaveolens*, *P. "Eucalyptus"*, *P. alba*, and *P. nigra var. italica*.

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Notes on a few hybrid poplars recommended for planting in Great Britain.

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[Czechoslovakia: Lesn. Knihovna] 1953. RYCHLE ROSTOUCI DREVINY A JEJICH PESTOVANI. [FAST-GROWING TREES AND THEIR CULTIVATION.] Lesn. Knihovna (Mala Rada) No. 30, 143 pp. 27 refs. [Part Cz., part Slovak.]

d'Alviella. 1923. POPLARS FOR THE DEVASTATED WAR-ZONE. Bull. Soc. For. Belg. 26: 598.

Duncan, D. P., Kaufert, F. H., and French, D. W. 1955. SELECTED POPLARS FOR MINNESOTA PLANTINGS. Minn. For. Note No. 43, 2 pp.

In an endeavor to find a canker-resistant, hardy, fast-growing, straight-grained poplar for *farm* planting in Minnesota, trial plantings were made of some 120 clones (including 75 hybrids). Height and diameter after 6 years, *degree of* cankering, and rooting capacity are tabulated for the 11 *best clones*.

Dzekov, S. 1959. PRVI REZULTATI KOMPARATIVNOG GAJENJA KLONOVA P. ROBUSTA, P. REGENERATA I P. THEVESTINA NA PODRUCJU SKOPSKE KOTLINE. [PRELIMINARY RESULTS OF THE COMPARATIVE CULTIVATION OF CLONES OF POPULUS X ROBUSTA, P. X REGENERATA AND P. NIGRA VAR. THEVESTINA IN THE SKOPJE BASIN.] Topola, Beograd 3(11): 895-907. 4 refs. [Serb.g.g.]

Elorrieta Artaza, J., Luxan Vaquero, F. de, and Alarcon Marticorena, F. 1958. SECCION DE REPOBLACIONES E INTRODUCCION DE ESPECIES. ACTIVIDADES DIVERSAS DE LA SECCION. [SECTION FOR AFFORESTATION AND INTRODUCTION OF SPECIES. VARIOUS ACTIVITIES.] An. Inst. For. Invest. Exp., Madrid 30(3): 23-32. [Span.]
Reports on *results of trials of poplar* hybrids and illustrates by means of graphs *the* comparative height growth during 1958 of *various poplar clones* established in 1957. Trials of *eucalypts* are also *in progress*.

Gancev, P. 1957. SRAVNITELNI IZUCUVANIE VARHU RASTEZA I RAZVITIETO NA NJAKOI VIDOVE TOPOLI. [COMPARATIVE STUDIES ON THE GROWTH OF SOME POPULUS SPP.] Gorsko Stopanstvo 13(8): 367-74. 1 ref. [Bulg.]

Reports trials with cuttings of 10 species of *poplar*. Height growth was best in "*P. deltoides f. eugeni*," *P. trichocarpa*, *P. trichocarpa x P. deltoides*, *P. deltoides* and *P. przewalskii*.

Gaussen, H., and Trochain, J. 1941. L'EXPERIENCE DES PEUPLIERS DE SEILH. [THE POPLAR TRIALS AT SEILH.] Trav. Lab. For. Toulouse 6(3), Art. 2, 22 pp. [F.]

Provisional data on survival and growth of a number of poplars at Seilh in the Pyrenees.

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- Hilf, H. H., and Rohmeder, E. 1951. PAPPELSORTENPRUFUNG. [THE TESTING OF POPLAR VARIETIES.] Forstarchiv 22(3/4;5/6): 53-7; 80-2. 14 refs. [G.]
- Irmak, A., and Saatcioglu, F. 1953. TRAKYA VE KOCAELINDE KAVAK YETISTIRILMESİ IMKANLARI UZERINE ARASTIRMALARI. [INVESTIGATION OF THE POSSIBILITIES OF POPLAR CULTIVATION IN TRAKYA AND KOCAELI [TURKEY].] Istanbul Univ. Orm. Fak. Derg. 3B(1/2):65-80. [Turk.]
- Chief reliance should be placed on American species successful in Italy and also *Populus nigra* var. *italica*. Two places, one in the valley of the Meric [e.g. Kurtbucagi forest] and the other near Adrianople, are recommended, but would need water in summer. No other places appear suitable.
- Ivannikov, S. P., Rostovcev, S. A., and Kazarcev, I. A. 1962. [FAST-GROWING SPECIES AND THEIR INDUSTRIAL UTILIZATION.] Lesn. Hoz.15(9): 13-9. 1 ref. [Russ.]
- Deals mainly with poplars for central European Russia. Various fast-growing species and hybrids are recommended for the steppe, forest-steppe, and mixed-forest zones.
- Jeffers, J. N. R. 1958. DESIGN OF POPLAR EXPERIMENTS. For. Rec. For. Comm., Lond. No. 38, 19 pp. 5 refs.
- The work carried out by the Research Branch of the British Forestry Commission since 1948 has suggested that there are special features in the design of poplar experiments that do not appear to be adequately described in published literature. It is the purpose of this record to make available the conclusions reached during the past 10 years.
- Jobling, J. 1957. METHODES STATISTIQUES A EMPLOYER DANS LES EXPERIENCES. [STATISTICAL METHODS IN EXPERIMENTS.] [Docum.] 13th Sess. Stand. Excc. Comm. Int. Poplar Comm., Paris 1957 No. FAO/CIP/CP, 11, 16 pp. [F.]
- A report summarizing replies to a questionnaire [cf. International: FAO/Int. Poplar Comm., 1955 and 1956, *Populus* sp., 232.11 /13], and discussing recommendations of a Working Party of I.U.F.R.O., with an annexe giving a system of symbols (letters and figures) to designate the nature, nursery treatment, and age of poplar plants, proposed by E. Allegri.
- Kaufmann. 1923. TREE PLANTING IN E. GRIQUALAND. Sth. Afr. For. Dept. No. 7.
- Knjazeva, L. A., and Orehov, G. P. 1963. [FAST-GROWING TREES IN W. KASAKHSTAN.] Lesn. Hoz. 16(8): 33-6. [Russ.]
- Graphs the height and diameter increment up to age 7 years, for seven species or cultivars of *Populus*.
- Lagorsse, B. M. 1931. POPLARS IN THE LIMOUSIN AND MARCHOISE REGIONS. Extr. L'Arbre et l'Eau, 19th An. Cong. Soc. Gay-Lussac (Limoges) Proc. 1930: 108-9.
- Meelker. 1931. THE POPLAR IN HOLLAND. Biol. Abstr. 5: 11778.
- Newcomer, E. H. 1946. A THREE-YEAR TRIAL OF HYBRID POPLARS IN NORTH CAROLINA. J. Elisha Mitchell Sci. Soc. 62(1):77-80. Bblg.
- Sipos, S. 1959. GYORSANNOVO FAFAJOK BEKES MEGYEEN. [FAST-GROWING SPECIES IN BEKES COUNTY.] Erdo 8(3): 102-8. [Hu. russ.g.]
- This county, with the best soils in Hungary, contains only 1.1% of its forests, but important additional timber production is possible. Only 35% of the area devoted to fast growing species carries poplars, a figure which should be raised to 55-60%. The opportunities are tabulated. Within 15 years a paying fibreboard plant of 25-30 thousand cu.m. capacity is an established possibility in this region.
- Sirjaeva, V. M. 1960. OSOBNOSTI ROSTA NEKOTORYH DREVESNYH POROD V USLOVIJAH SREDNEGO TECENIJA AMU-DAR I I IH ROL V SOZDANII IRRIGACIONNYH LESONASAZDENIJ. [FEATURES OF THE GROWTH OF SOME WOODY SPECIES IN THE CENTRAL PART OF THE AMU-DARYA VALLEY. AND THEIR IMPORTANCE IN THE CREATION OF IRRIGATED STANDS.] Lesn. Z. Arhnnge'sk 3(1): 49-53. 4 refs. [Russ.]
- Somogyi, Z. 1958. GYORSANNOVO FAFAJOK AZ ORMANSAGON. [FAST GROWING SPECIES IN THE ORMANSAG DISTRICT.] Erdo 7(11):

428-33. [Hu.hu.russ.g.]

As between flood-plain, depressions, and areas subject to flooding, selected poplars do best on the last and less well on the first two. In depressions there is often a sticky gley layer where canker is frequent. On the better soils, through lack of timely tending, poplars suffer much damage also. Poplars are more suited to agricultural soils where single-row or strip planting will give accelerated production.

Szigethy, B. 1959. GYORSANNOVO FAFAJOK TELEPITESENAK LEHE-TOSEGEI A KELETBUKKI ERDOGAZDASAG TERULETEN. [POSSIBILITIES OF PLANTING FAST-GROWING WOODY SPECIES IN THE KELET-BUKK FOREST REGION.] Erdo 8(8): 308-11. [Hu.russ.g.]

Toth, I. 1960. A DUNAARTERI ERDOGAZDALKODAS AGYES KERDESEI. [SOME QUESTIONS ON THE ECONOMY OF THE DANUBE FLOOD-PLAIN FORESTS.] Erdo 9(7): 253-7. [Hu.russ.g.]

Contains tabulated statistics of area and yield by species and their values. Ca. 1/3 of the forest area is suitable for poplars, which provide the greatest volume and value yields, amenable also to augmentation. Improvements in willow cultivation lie in breeding, and the abolition of the coppice system, and timely tending. Oaks, if planted, should be mixed with poplars; game control is an important prerequisite.

[U.S.A.: Lake St. For. Exp. Sta.] 1939. A FAST-GROWING AND WINTER-HARDY POPLAR STILL TO BE FOUND FOR THE LAKE STATES. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 153.

Vill. 1930. STUDIES OF HYBRID POPLARS IN THE RHINE "ALLEY IN THE PALATINATE. Mitt. Dtsch. Dendrol. Ges. 42: 285.

Wettstein-Westerheim. 1934. WELCHE PAPPELN KONNEN ZUR FORSTLICHEN PFLANZUNG EMPFOHLEN WERDEN? [WHAT POPLARS CAN BE RECOMMENDED FOR FOREST PLANTING?] Forstarchiv 10: 97-101. [G.]

Wroblewski and Walisch. 1930. ACCLIMATIZATION AN" CULTURE OF POPLAR IN POLAND. Toulouse For. Lab. Bibliogr., p. 33.

232.1 1

Allegri, E. 1950. UN PIOPPETO SPERIMENTALE IN TOSCANA. [AN EXPERIMENTAL POPLAR PLANTATION IN TUSCANY.] Montie Boschi 8: 345-55. [It.f.e.]

[Argentina: Adm. Nac. Bosques, B. Aires] 1955. CULTIVO DE LOS ALAMOS. [THE CULTIVATION OF POPLARS.] Hoja Divulg. Adm. Nac. Bosques, B. Aires No. 6, 3 pp. [Span.]

Short notes on the performance of *Populus* spp. in Argentina, their silvicultural requirements and methods of establishing plantations.

Chardenon, J. 1954. LES PEUPLIERS AMERICAINS D'IMPORTATION RECENTE. [AMERICAN POPLARS RECENTLY IMPORTED INTO FRANCE.] [Pap.] 8th Int. Bot. Congr. Paris Sect. 13: 144.5. [F.]

1955. RECENTES INTRODUCTIONS DE PEUPLIERS "ES ETATS UNIS EN FRANCE. [POPLARS RECENTLY INTRODUCED FROM THE U.S.A. TO FRANCE.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/19-H, 2 pp. [F.]

Among the varieties mentioned as received and tested (*P. deltoides*, *P. fremontii*, *P. wislizenii*, *P. sargentii*, *P. trichocarpa*, and *P. angustifolia*), southern provenances of *P. deltoides* appear most promising for French conditions, though many are not sufficiently frost-hardy.

Fernandez, A. E. 1960. OBSERVACIONES SOBRE CRECIMIENTO DE ALAMOS EN LA ESTACION FORESTAL DEL PARANA MINI. [GROWTH OF POPLARS AT THE PARANA MINI FORESTRY CENTRE.] Foll. Tec. For. Adm. Nac. Bosques, B. Aires No. 10, 11 pp. [Span.span.]

Gunther, H. 1957. GEBIRGSPAPPELN. [MOUNTAIN POPLARS.] Wiss. Abh. Dtsch. Akad. Landw. Berlin No. 27 (Beitr. Pappel-forsch. No. 2): 1-33. 6 refs. [G.g.]

Iljicev, D. A., and Fedorako, B. I. 1952. VYRASOVANIE TOPOLJA V BASHKIRII. [CULTIVATION OF POPLAR IN THE BASHKIRIA.] Lesn. Hoz. 5(9): 58-60. [Russ.]

Joachim, H. F. 1960. UNTERSUCHUNGEN IN REIHENPFLANZUNGEN DER PAPPEL. [INVESTIGATIONS IN SINGLE-ROW PLANTING OF POPLARS.] Arch. Forstw. 9(3): 201-58. 34 refs. [G.g.russ.e.]

- Matveev, P. N. 1960. RAZVEDENIE TOPOLEJ V TUGAJAH. [CULTIVATING POPLARS IN [CENTRAL ASIAN] RIPARIAN WOODLANDS.] Lesn. Hoz. 12(9): 42-4. [Russ.]
- Neumann, 1956. BEMERKUNGEN UBER EINIGE PAPPELARTEN. [NOTES ON SOME POPLAR VARIETIES.] Forst- u. Holzw. 11(16): 345-6. [G.] Summarizes an article of that title, by a Herr Walter, in the "Forst- und Jagdarchiv von und für Preussen," May 1817, mentioning experience with *Populus deltoides*, *P. canescens*, *balsam* poplar and Lombardy *poplar*, in Prussia over 100 years ago.
- Salins, S., and Smilga, J. 1960. PETIJUMI PAR DAZAMPAPELU SUGAMKOKAUDZETAVA. [NURSERY INVESTIGATIONS ON SOME POPLARS.] Trud. Inst. Lesohoz. Probl., Riga No. 20: 55-69. 15 refs. [Latv. russ.]
- Soromaa, O. 1956. ALGUNOS DATOS SOBRE EL DESARROLLO DEL ALAMO EN FORMACION EN LOS BOSQUES DE LAS ZONAS DE RENGO Y PARRAL. [DATA ON THE DEVELOPMENT OF POPLAR STANDS IN THE RENGO AND PARRAL REGIONS.] Chile Maderero 6(2): 11-4. [Span.] The poplar plantations of Rengo and Parral were established for the match industry. Notes are presented on climate and soils, with **data on** increment and yield of normal stands.
- Toth, B. 1960. NYARFATERMELESITANULSAGOK A PUSPOKLADANYI SZIKKISERLETI TELEPEN. [EXPERIENCE IN GROWING POPLARS AT THE "SZIK" SOILS EXPERIMENT STATION, PUSPOKLADANY.] Erdo 9(2): 49-59. [Hu.russ.g.] Gives soil properties and growth-data tables. A relatively high pulpwood production is possible in 10-15 years on these soils, and poplar is considered a better economic proposition than the pedunculate oak hitherto favored. As, however, this can be proved only by long and difficult trials, an initial mixture of oak and poplar is advised.
- 232.1 1/13
- Gunzl, L. 1954. ERGEBNISSE DER OSTERREICHISCHEN PAPPELSORTENPRUFUNG 1949-52. [RESULTS OF POPLAR VARIETY TESTS IN AUSTRIA, 1949-52.] Allg. Forstztg. 65(9/10): 125-31. 11 refs. [G.g.]
- [International: FAO/Int. Poplar Comm.] 1955 and 1956. STATISTICAL METHODS IN EXPERIMENTS. [QUESTIONNAIRE CONCERNING MEASUREMENTS AND OBSERVATIONS IN POPLAR EXPERIMENTS AND REPLIES FROM SWITZERLAND, UNITED KINGDOM, BELGIUM, SPAIN, U.S.A., AUSTRIA, SWEDEN, AND FRANCE.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/CP/77, 1955. 8 pp. [Pap.] 12th Sess. Stand. Exec. Comm. Int. Poplar Comm., Brussels 1956 Nos. FAO/CIP/CP/7-A to -H, 1956. Each 3 pp. [E. or F.]
1956. STATISTICAL METHODS IN EXPERIMENTS. MEASUREMENTS AND OBSERVATIONS IN POPLAR EXPERIMENTS. GERMANY. [Docum.] 12th Sess. Stand. Exec. Comm. Int. Poplar Comm., Brussels 1956 No. FAO/CIP/CP/7-L-a,b&c. Each 2 pp. [E.] Three answers to questionnaire FAO/CIP/77.
1956. STATISTICAL METHODS IN EXPERIMENTS. MEASUREMENTS AND OBSERVATIONS IN POPLAR EXPERIMENTS. REPLIES TO QUESTIONNAIRE OF DOCUMENT FAO/CIP/77. EGYPT. IRAQ. [Docum.] 12th Sess. Stand. Exec. Comm. Int. Poplar Comm., Brussels 1956 No. FAO/CIP/7-I, 3 pp., and No. FAO/CIP/7-J, 7 pp. LE.1
1956. METHODES EMPLOYEES DANS LES EXPERIENCES EN COURS. MESURES ET OBSERVATIONS DANS LES ESSAIS DE PEUPLIER. REPONSES AU QUESTIONNAIRE DU DOCUMENT FAO/CIP/77. IRAN. [STATISTICAL METHODS IN EXPERIMENTS. MEASUREMENTS AND OBSERVATIONS IN POPLAR EXPERIMENTS. REPLIES TO QUESTIONNAIRE FAO/CIP/77. IRAN.] [Docum.] 12th Sess. Stand. Exec. Comm. Int. Poplar Comm., Brussels 1956. 3 pp. [F.]
- Jayme, G., and Harders-Steinhausner, M. 1963. [COMPARATIVE RESULTS FROM A POPLAR CULTIVATION STUDY IN 1943-61.] Papier, Darmstadt 17(7): 298-306. [G.g.e.f.]
- Jobling, J. 1957. STATISTICAL METHODS IN EXPERIMENTS. A REPORT PREPARED BY MR. J. JOBLING, ASSISTANT SILVICULTURIST, ON THE BASIS OF THE QUESTIONNAIRES COMPLETED BY THE NATIONAL POPLAR COMMISSION. [Docum.] 13th Sess. Stand. Exec. Comm. Int. Poplar Comm., Paris 1957 No. FAO/CIP/CP/11, 16 pp. [E.]

1960. POPLARS AND ELMS. Extr. from Rep. For. Res. For. Comm., Lond. 1958159: 54-8.

- Levasev, B. G. 1963. [PLANTATIONS OF NEW POPLARS IN BASHKIRIA.] Lesn. Hoz. 16(4): 35-40. [Russ.]
- Szeless, S. 1954. VERSUCHE MIT PAPPELN IM OBEREN MURZTAL. [POPLAR TRIALS IN THE UPPER MURZ VALLEY.] Allg. Forstztg. 65(1/2): 8-9. [G.]
- Templin, E. 1956. MOGLICHKEITEN EINER INTERNATIONALEN ZUSAMMENARBEIT BEI DER PRUFUNG WIDERSTANDSAHIGER PAPPELKLONE GEGEN TIERISCHEN SCHADLINGSBEFALL. [POSSIBILITIES OF INTERNATIONAL CO-OPERATION IN TESTING POPLAR CLONES RESISTANT TO INSECT PESTS.] [Docum.] 12th Congr. Int. Union For. Res. Organ., Oxford 1956 No. IUFRO/56/24/17, 4 pp. [G.]
- Zarhina, E. S. 1963. [TESTING POPLAR VARIETIES IN THE AMUR REGION.] Lesn. Hoz. 16(3): 21-4. [Russ.] Gives preliminary results of 2-3 years' nursery and field testing of many poplar varieties and hybrids.
- Baldwin, H. I. 1941. GROWTH OF HYBRID POPLARS. Fox For. Notes No. 26, 1 p.
- Bezkorovajnyj, M. F. 1958. GIBRIDNYE TOPOLI V LENINGRAD-SKOJ OBLASTI. [HYBRID POPLARS IN THE LENINGRAD AREA.] Lesn. Hoz. 11(3): 82. [Russ.] A brief note on trials with cuttings of 10 hybrid poplars, giving percent take, height at 1 year, and at 2 years (after a severe winter in which temperatures reached -34° C. in December, January, and February), when heights ranged from 1.3 to 2.4 m.
- Blow, F. E. 1948. HYBRID POPLAR PERFORMANCE IN TESTS IN THE TENNESSEE VALLEY. J. For. 46(7): 493-9. 14 refs.
- Cram, W. H. 1960. PERFORMANCE OF SEVENTEEN POPLAR CLONES IN SOUTH CENTRAL SASKATCHEWAN. For. Chron. 36(3): 204-8, 224. 14 refs.
- Dalal, S. S., Patnaik, N., and Singh, B. 1962. PRELIMINARY TRIALS ON POPLARS. Indian For. 88(8): 552-9. 3 refs. Preliminary results of trials of 15 poplar clones in the Dun Valley, Dehra Dun. It is concluded that conditions are very favorable to poplar growth. By far the most successful clone was *Populus* "Casale 488," with "Casale 30" close behind. Moderately good were "Heidemij J.J. 116," "Robusta A E," *P. nigra* var. *italica* "F," "Rubra boiret," "Eugenii U.L.," "Eugenii B" and "Regenerata carpieri."
- Doolittle, W. T. 1953. GROWTH AND SURVIVAL OF HYBRID POPLARS. Sth. Lumberm. 187(2345): 178-9.
- Elorrieta Artaza, J., and Alarcon Marticorena, F. 1957. SECCION DE REPOBLACIONES E INTRODUCCION DE ESPECIES. [SECTION FOR AFFORESTATION AND INTRODUCTION OF SPECIES.] An. Inst. For. Invest. Exp., Madrid No. 2: 41-7. [Span.] Reports on the previous year's trials of poplar hybrids and clones.
- Funk, D. T. 1963. HYBRID POPLARS ON OHIO SPOIL BANKS. U.S. For. Serv. Cent. St. For. Exp. Sta. Res. Note No. CS-8, 4 pp. 7 refs. Columbus, Ohio. Describes trials begun in 1951 with 50 hybrid clones on strip-mined areas with sparse vegetation, showing that such cultivation is possible on the more permeable and better aerated banks, and summarizes results with particular clones.
- Gysel, L. W. 1949. THE SURVIVAL AND GROWTH OF HYBRID POPLARS IN FOUR MICHIGAN TEST AREAS. Quart. Bull. Mich. Agric. Exp. Sta. 32(1): 156-65.
- Hara, M., and Tanaka, K. 1955. [ON THE GROWTH OF CUTTINGS OF POPLARS [OBTAINED] BY CROSSING IN U.S.A.] Trans. Tottori Soc. Agric. Sci., Tottori 10(4): 30-3. 3 refs. [Jap.e.e.]
- [International: FAO/Int. Poplar Comm.] 1953. DIRECTIONS FOR THE SURVEY OF POPLAR AREAL PLOTS BY THE NATIONAL POPLAR COMMISSION OF THE NETHERLANDS. [Pap.] 7th Sess. Int. Poplar Comm. No. FAO/53/8/6312, 10 pp. Directions for (1) methods of measurement, (2) design of experimental plots, in research on poplar clones.
- Janson, L. 1960. WZROST ROZNYCH FORM TOPOLI W CZTEROLET-NIEJ UPRAWIE PROWADZONEJ EKSTENSYWNIE. [GROWTH OF VARIOUS

FORMS OF POPLAR IN FOUR-YEAR-OLD PLANTATIONS RUN ON EXTENSIVE LINES.] Sylwan 104(7): 79-86. [Pol.] (Biul. Inst. Bad. Lesn. No. 3. 1960.)

Konovalov, N. A. 1963. [SELECTION AND BREEDING OF FAST-GROWING TREE SPECIES IN THE CENTRAL URALS.] Lesn. Hoz. 16(7): 55-8. [Russ.]

Newcomer, E. H. 1946. A THREE-YEAR TRIAL OF HYBRID POPLARS IN NORTH CAROLINA. J. Elisha Mitchell Sci. Soc. 62(1): 77-80. Bblg.

Rader-Roitze, J. E. 1956. DER PAPPEL-PROBEANBAU VOM JAHRE 1951 IN SÜDDEUTSCHLAND. [POPLAR TRIALS OF 1951 IN SOUTHERN GERMANY.] Schweiz. Z. Forstw. 107(8/9): 444-57. 8 refs. [G.f.] Discusses results, and tabulates mean values, of *mortality*, height and diameter growth, and *injuries*, from 150 trials covering the first 3 growing seasons of the following: *Populus regenerata*, *P. bachelieri*, *P. vernirubens*, *P. serotina*, *P. "canadensis"* Leipzig, *P. marilandica*, *P. robusta* I., *P. robusta* II (*Isarpappel*) and *P. gelrica* planted as 1- or 2-year-old stock.

Rubbo, R. 1957. LOS ALAMOS HIBRIDOS EN EL URUGUAY. [HYBRID POPLARS IN URUGUAY.] Montes, Madrid 13(73): 16-8. [Span.] Notes on the introduction of hybrid poplars into Uruguay, with an estimate of the susceptibility or resistance to *Melampsora* spp. and *Septoria* spp. of six different clones, and recommends the founding of a Poplar Institute in Uruguay or the lines of the one at Casale Monferrato in Italy.

Rudolf, P. O. 1948. HYBRID POPLAR PLANTING IN THE LAKE STATES. U. S. For. Serv. Lake St. For. Exp. Sta., Sta. Pap. No. 14, 17 pp. 6 refs.

Santamour, F. S., Jr. 1960. THE RELATION BETWEEN ANATOMY AND INHERENT GROWTH POTENTIAL OF HYBRID POPLARS. Abstr. of thesis, in Dissert. Abstr. 21(4): 718. [Univ. Minn.]

Sebald, O. 1959. ERGEBNISSE VON PAPPELSORTEN-VERGLEICHVERSUCHEN. I. ERSTE AUSWERTUNG DER 1948 BIS 1953 IN NORDWURTEMBERG ANGELEGTE BEOBSACHTUNGSFLÄCHEN. [TRIALS OF POPLAR VARIETIES. I. FIRST RESULTS OF OBSERVATION PLOTS ESTABLISHED IN N. WURTEMBERG FROM 1948 TO 1953.] Mitt. Ver. Forstl. Standortskunde Forstpfzucht. No. 8: 3-34. 33 refs. [G.g.]

Silen, R. R. 1947. COMPARATIVE GROWTH OF HYBRID POPLARS AND NATIVE NORTHERN BLACK COTTONWOODS. U. S. For. Serv. Pacif. Northwest. For. Exp. Sta. For. Res. Notes No. 35, 3 pp.

Stecki, Z. 1963. [INVESTIGATIONS ON GROWTH OF POPLAR HYBRIDS WITH REFERENCE TO SELECTION.] Arboretum Kornickie, Poznan 8: 155-218. 47 refs. [Pol.russ.e.e.]

Trimble, G. R., Jr. 1963. HYBRID POPLAR GROWS POORLY ON ACID SPOIL BANKS AT HIGH ELEVATIONS IN WEST VIRGINIA. U. S. For. Serv. Res. Note NE-7, 4 pp. Ntheast. For. Exp. Sta., Upper Darby, Pa.

[U.S.S.R.: Akad. Nauk Kazah. SSR] 1962. DREVESNAJA RASTITEL'NOST ALMA-ATINSKOGO BOTANICESKOGO SADA. [THE WOODY PLANTS OF THE ALMA-ATA BOTANICAL GARDEN.] Izdatel'stvo Akademii Nauk Kazahskoj SSR, Alma-Ata. 329 pp. 66 refs. [Russ.]

232.3

Richter. 1929. SEEDING FROM P. ALBA, TREMULA AND CANADENSIS. Silva 17: 258.

Thaler. 1906. CULTIVATION OF POPLARS AND SORBUS FROM SEED. F. & J. Zeitung 82: 117.

———. 1908. CULTIVATION OF POPLAR FROM SEED. F. & J. Zeitung 84: 378.

Vonhausen. 1879. NOTE ON CULTIVATION OF ITALIAN POPULUS FROM SEED. Allg. Forst- u. Jagdztg. 55: 261-2.

———. 1881. CULTIVATION OF ITALIAN POPLAR FROM SEED. Allg. Forst- u. Jagdztg. 57: 297-302.

232.3 1

Moss, E. H. 1938. LONGEVITY OF SEED AND ESTABLISHMENT OF SEEDLINGS IN SPECIES OF POPULUS. Bot. Gaz. 99(3): 529-542. Biol. Abstr. 12(4): 7056. 1938.

Richter. 1934. UBER PAPPELSAATEN. [ON POPLAR SEED.] Forstl. Wochenschr. Silva 22: 321-22. [G.]

Richter, H. 1936. ON POPLAR SEED. Forstwiss. Cbl. 58(24): 813-18. [G.]

232.3 1 1.2

Babos, I. 1959(1960). MAGTERMELO AKACOSOK ES NYARFASOK VIZSGALATA. [SEED-PRODUCING STANDS OF ROBINIA AND POPLARS.] Erdesz. Kutatas., Budapest 6(3): 15-65. 22 refs. [Hu.russ.g.e. russ.g.e.]

232.312

Roe, E. I., and McCain, D. P. 1962. A QUICK METHOD OF COLLECTING AND CLEANING ASPEN SEED. U. S. For. Serv. Tree Plant. Notes No. 51: 17-8.

Branches of *Populus grandidentata* and *P. tremuloides* bearing near-mature catkins are brought into a warm, closed room with little air movement. When the catkins begin to open, the seed is collected with an upholstery-type vacuum cleaner; the mass of cotton is then removed from the cleaner bag, placed between screens, and the seed extracted by the use of compressed air.

232.3 12.2

Einspahr, D., and Schlafke, D. 1957. A METHOD FOR ASPEN AND COTTONWOOD SEED EXTRACTION. U. S. For. Serv. Tree Plant. Notes No. 28: 10.

Describes a simple method, involving the use of a piece of cardboard tubing, three superimposed sieves, and a compressed-air line (illustrated).

Marjai, Z. 1959. A NYARMAG CEPI SZIKKASZTASA. [THE MECHANICAL DRYING OF POPLAR SEED.] Erdo 8(3): 94-7. [Hu.russ.g.] It was found that keeping improved and germination was relatively higher (70-80%) if moisture content of seed was held at 5-8%. After a pilot trial with a hair-drier playing through a drum, a larger scale operation showed that a fan blowing through a cylinder 20 cm. long x 50 cm. wide could dry 10 kg. of seed in 8 hours.

232.3 15

Johnson, L. P. V. 1946. EFFECT OF HUMIDITY ON THE LONGEVITY OF POPULUS AND ULMUS SEEDS IN STORAGE. Canad. J. Res. 24th (6): 298-302. Bblg.

232.315.2

Kopeczky, F. 1954. A NYARMAGVAK CSIRAZASELETTANI VIZSGALATA. [INVESTIGATIONS ON THE PHYSIOLOGY OF GERMINATION OF POPLAR SEEDS.] Erdesz. Kutatas., Budapest 1954(1): 6-17. [Hu.] From abstr. in Hung. Agric. Rev. 3(2): 8. 1954. [E.]

Poplar seed [species not named] stored in a desiccator (with CaCl₂) placed in an ice-box at 0.5°C., showed only slight decrease of germinative capacity from the initial 98 to 94% after 5 months.

Sato, Y. 1949. ON THE VIABILITY OF POPULUS SEEDS. Res. Bull. Exp. For. Hokkaido Univ. 14(2): 77-92. 22 refs. [Jap.jap.o.]

232.318

Tucovic, A. 1955. NEKA ZAPASANJA O KLIJAVOSTI SEMENA TOPOLA. [THE GERMINATION OF POPLAR SEEDS.] Glasn. Sum. Fak., Beograd No. 9: 167-77. 6 refs. [Serb.g.]

Compares the germinative energy and germination percent of seed of 10 poplar species, collected from and around Belgrade.

232.32

Bocke. 1924. NOTE ON THE RAISING OF POPLARS. Dtsch. Forstztg. 39: 1114.

Geyda, K. 1948. O TOPOLI I JEJ ROZMNAZANIU. [POPLARS AND THEIR PROPAGATION.] Wydaw. Pomocn. Tech. -Gosp. Inst. Bad. Lesn. No. 17, 84 pp. 15 refs. [Pol.]

Gunther, H. 1958. DEZENTRALISIERUNG ODER ZENTRALISIERUNG DER ERZIEHUNG "ON PAPPELPFLANZEN? [CENTRALIZATION OR DECENTRALIZATION IN THE RAISING OF POPLAR PLANTS?] Forst u. Jagd 8(4): 156-8. [G.]

Advocates large centralized nurseries, as seen on a study tour in Hungary, because large nurseries devoted to poplar growing

would be *able* to obtain *expert* personnel, and their management, control, and mechanization *would* be easier than that of small, decentralized ones.

Hoffmann, R. 1936. RAISING POPLARS FROM SEED. Forstwiss. Cbl. 58(1): 28-34. [G.]

Houtzagers, G. 1941. WET KWEEKEN "AN POPULIERENHEESTERS. [THE RAISING OF POPLAR PLANTING STOCK.] Ned. Boschb.-Tijdschr. 14(3): 114-7. [Du.]

[Jugoslavia: Gozd Vestn.] 1954. RAZMNOZEVANJE TOPOLOV (BELEGA, CRNEGA, SIVEGA IN TREPETLIKE) S SEMENI. [PROPAGATION OF POPLARS (POPULUS ALBA, P. NIGRA, P. CANESCENS AND P. TREMULA) FROM SEED.] Gozd. Vestn. 12(4): 118-9. [Sloven.]

Kopecky, F. 1961. ERDOGAZDASAGAIK NYAR ES FEHERFUZ TORZSANYATELEPEINEK ALLAPOTA. [CONDITION OF THE POPLAR AND WILLOW NURSERIES IN HUNGARY.] Erdo 10(7): 288-92. [Hu.russ.g.] It is proposed to reduce the % of *P. x serotina* (26) in favor of *P. x robusta* (21) in the 166 ha. of nurseries concerned and raise also the proportion of new clones under test. Trials of 100x100 cm. spacing produced too large material in the first 2-3 years and thereafter perfect material for 6-7 years. With smaller spacing the nursery soil gets exhausted in 5-G years. Insect damage has greatly increased in several nurseries.

Liese. 1933. PRODUCTION OF HEALTHY ASPEN AND POPLAR PLANTS. Forstarchiv 9: 109.

Lucke, H. 1951. PAPPEL- PFLANZENZUCHT UND -ANBAU. [POPLAR PROPAGATION AND THE ESTABLISHMENT OF POPLAR PLANTATIONS.] M. & H. Schaper, Hannover. 54 pp. 21 refs. [G.] A practical guide to nursery work (propagation by seed, root suckers, and cuttings: tending: and diseases and pests of nursery stock) and planting (choice of site and variety, planting methods, spacing, and early tending) with chief reference to the hybrid black poplars.

Osaja, D. 1948. NYARCSEMETER NEVELESE. [THE RAISING OF POPLARS FROM SEED.] Erdesz. Lapok. 84(2/3):100-4. [Hu.g.f.e.]

Ournay. 1896. PROPAGATION METHODS FOR THE POPLAR. Bull. Soc. For. Belg. 3: 793.

Pavlenko, F. A., and Starova, N. V. 1958. VYRASCIVANIE SEJANCEV TOPOLEJ NA UKRAINE. [GROWING POPLAR SEEDLINGS IN THE UKRAINE.] Lesn. Hoz. 11(4): 22-6. [Russ.]

Walter. 1957. KOMBINATION DES PAPPELANBAUS MIT LANDWIRTSCHAFTLICHER ZWISCHENNUTZUNG. [A COMBINATION OF POPLAR GROWING WITH AGRICULTURAL INTERCROPPING.] Forst u. Jagd Spec. No. Die Pappel 2: 14-5. [G.]

Wettstein, W. 1958. STAND DER PAPPELANZUCHT IN OSTERREICH IM JAHRE 1957. [POPLAR RAISING IN AUSTRIA IN 1957.] Holz-Kurier 13(1):10-2. [G.] Data on the number of 1 + 1, 1 + 2, etc. plants produced and/or available for sale, with a note on changes in nomenclature of some cultivars.

232 322 1

Gunther, H., and Morgeneyer, W. 1956. LUPINENVORANBAU IN PAPPELMUTTERGARTEN. [SOIL PREPARATION WITH LUPINS IN POPLAR STOLL-BEDS.] Forst u. Jagd 6(4):180-2. [G.]

232.322.4

Girardini, A. 1963. RICERCHE SPERIMENTALI SULLA CONCIMAZIONE DEL PIOPO. [EXPERIMENTAL RESEARCH ON THE FERTILIZING OF POPLAR.] Centro Incremento Fertilizzazioni, Consulta per l'Agricoltura e le Foreste delle Venezia, Venice. 123 pp. [It.] Gives an account of the experiments and preliminary results of the first 4 years, on representative soils of Venetia. Subjects of research are nutrition of poplar, the use of compound fertilizers, and methods of application.

Gunther, H. 1956. UNTERSUCHUNGEN UBER DIE VERWENDUNG "ON PAPPELSTECKLINGEN ZUR KIPPENKULTIVIERUNG IN DER NIEDERLAUSITZ [THE USE OF POPLAR CUTTINGS FOR THE REVEGETATION OF SPOILMOUNDS IN THE NIEDERLAUSITZ.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 16 (Beitr. Pappelforsch. No. 1): 51-70. 6 refs. [G.g.]

Morani, V. 1961. RICERCHE SULLA CONCIMAZIONE DEL PIOPO. [RESEARCH ON THE FERTILIZING OF POPLAR.] Cellulosa e Carta 12(10): 8-12. 25 refs. [It.f.e.g.] Reviews the results of research (mainly in England, France, and Italy) during the past 10 years on the application of fertilizers to poplars in the nursery and in the field.

232.322.41

Gunther, H. 1957. DIE VERWENDUNG VON "GLUCKAUF"—VOLL-DUNGER ZUR ERZIEHUNG "ON PAPPELPFLANZEN. [THE USE OF THE "GLUCKAUF" COMPLETE FERTILIZER IN GROWING YOUNG POPLARS.] Forst u. Jagd Spec. No. Die Pappel 2: 12-5. [G.] When this fertilizer, containing 10% N, 7% P_2O_5 , 20% K_2O , 17% $MgSO_4$, 10% CaO plus trace elements, was tried on 1-year poplar plants on a rather poor, neutral sandy loam at 300, 600, and 900 kg./ha., second-year height growth exceeded controls by 36, 69.9, and 81.9% respectively.

232 322.41 1

Giulimondi, G. 1961. EFFETTI DELLA CONCIMAZIONE AZOTATA SU PIOPELLE IN VIVAIO. [THE EFFECTS OF N FERTILIZING ON YOUNG POPLARS IN THE NURSERY.] Cellulosa e Carta 12(5):27-30. 6 refs. [It.f.e.g.]

Presents and discusses data from experiments at Rome in which nursery beds were fertilized with $(NH_4)_2SO_4$ at rates of 400 and 800 kg./ha.; mean height and mean d.b.h. increased with increasing applications of N, but mean d.b.h. of height classes diminished; moisture content increased and specific gravity decreased. Measurements were made 9 months after the rooted cuttings were planted.

232.322.412

[Netherlands: T.N.O.] 1957. [APPLICATION OF FERTILIZERS TO POPLARS.] Korte Meded. Bosbouwproefsta., T.N.O., Wageningen No. 30: 13-4. [Du.]

A number of field trials have been laid out. In greenhouse tests, root and top growth of cuttings of *Populus robusta* were greatly improved by addition of basic slag to the soil. Superphosphate reduced growth, probably because of acidity, excessive salt concentrations or both.

Schonnamsgrubner, H. 1956. DUNGUNGSVERSUCHE MIT PHOSPHAT BEI PAPPELJUNGPFLANZEN. [FERTILIZER TRIALS WITH PHOSPHATES ON YOUNG POPLAR PLANTS.] Phosphorsaure, Essen 16(1/2): 56-68. 5 refs. [G.g.]

232.323

Bakkay, L. 1954. NYAR MAGCSEMETER NEVELES. [THE RAISING OF POPLAR SEEDLINGS.] Erdo 3(8):267-70. [Hu.]

Welcer-Kawecka, A. 1955. JAKIE ROZMNIAZANIE TOPOLI JEST KORZYSTNIEJSZE? [WHAT METHOD OF POPLAR PROPAGATION IS THE MOST ADVANTAGEOUS?] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 10: 223-31. 10 refs. [Pol.russ.e.] Discusses the merits of propagation by seeds and by cuttings.

Zlataric, B. 1953. NEKE SAVREMENE METODE RAZMNOZAVANJA DOMACIH TOPOLA. [SOME MODERN METHODS OF PROPAGATING INDIGENOUS POPLARS.] Sum. List 77(6): 255-62. 2 refs. [Croat.e.]

232.324.1

Fleischer, E. 1957. MASCHINELLES PFLANZENHEBEN DURCH PFLANZENHEBEPFLUG "GRAUPA." [MECHANICAL LIFTING WITH THE "GRAUPA" PLANT-LIFTING PLOUGH.] Forst u. Jagd Spec. No. Die Pappel 2: 42-5. [G.]

Describes operations with a tractor-drawn plough in poplar nurseries, including working costs. It is claimed that even heavy soils are loosened sufficiently for easy lifting, and that roots suffer fewer injuries than with manual work.

232.328

Anonymous. 1923. THE ROOTING OF POPLAR CUTTINGS. Trans. Scot. Arbor. Soc. 37: 82.

Geyda, K. 1948. O TOPOLIJEJ ROZMNIAZANIU. [POPLARS AND THEIR PROPAGATION.] Wydaw. Pomocn. Tech. -Gosp. Inst. Bad. Lesn. No. 17, 84 pp. 15 refs. [Pol.]

Vincent, G., and Spalek, v. 1949'50. STANDARDNI OZNACENI TOPOLOVYCHSAZENICARIZKU. [STANDARD DESIGNATIONS FOR POPULAR PLANTS AND CUTTINGS (OF DIFFERENT VEGETATIVELY PROPAGATED GENERATIONS).] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 22 (2) :317-21. (Cz.russ.f.)

232.328.1

Bier, J. E. 1961. THE RELATION OF BARK MOISTURE TO THE DEVELOPMENT OF CANKER DISEASES CAUSED BY NATIVE, FACULTATIVE PARASITES. V. ROOTING BEHAVIOR AND DISEASE VULNERABILITY IN CUTTINGS OF *POPULUS TRICHOCARPATA* TORREY AND GRAY, AND *P. 'ROBUSTA'*. Canad. J. Bot. 39(1): 145-54. 7 refs.

Cram, W. H. 1951. THE RELATION OF SIZE AND STORAGE OF CUTTINGS TO ROOTING CAPACITY OF *POPULAR* CLONES. Dom. For. Nursery Sta. Sask. 1 p.
Size of cutting had no apparent effect. Outdoor storage (heeling in) produced ca. 20% more rooted cuttings than cellar storage (in moist sand).

——— [1959.] NURSERY RESEARCH: MATURITY OF *POPULAR* CUTTINGS. Rep. Dom. For. Nursery Sta. Sask. 1958: 10.
Cuttings taken (a) on 9 Oct. and (b) on 29 Oct., stored out of doors and planted in the following May, did not differ significantly in moisture content, but (b) gave much superior establishment (53.5 vs. 42.7%) and height growth 112 days after planting (45.1 vs. 29.6 cm.).

Ford, H. F. 1954. EFFECT OF STERILIZING TREATMENTS ON SURVIVAL AND GROWTH OF HYBRID *POPULAR* CUTTINGS. U.S. For. Serv. Northeast. For. Exp. Sta., For. Res. Note No. 33, 3 pp. 2 refs.

——— and Waterman, A. M. 1954. EFFECT OF SURFACE STERILIZATION ON SURVIVAL AND GROWTH OF FIELD-PLANTED HYBRID *POPULAR* CUTTINGS. U. S. Dep. Agr. Plant Dis. Repr. 38(2):101-5.

Gremmen, J. 1961. HETVOORKOMEN VAN GLOMERELLA MIYABEANA OP DE *POPULIER*. [G. MIYABEANA ON *POPULAR*.] Ned. Boschb.-Tijdschr. 33(5): 131.3. 5 refs. [D.u.e.]

Harkai, L. 1960. DUGVANYIKHOZATALI VIZSGALATOK A BAJTIORSZAGOS NYARTORZSANYATELEPEN. [CUTTING PRODUCTION STUDIES IN THE STATE *POPULAR* CLONE GARDEN AT BAJTI.] Erdo 9(6):201-4. 2 refs. [Hu.russ.g.]

Investigates in a new garden the cutting production of seven clones from a 4- to 5-year-old garden. It is considered that such gardens should be worked 7-8 years, then heavily fertilized and sown to agricultural crops for 1-2 years. The clones were of *P. × canadensis*, *P. nigra* and *P. deltoides* × *P. italica*.

Hyun, S. K. 1962. AUTORADIOGRAPHIC STUDIES ON THE ABSORPTION AND RETENTION OF ROOTING PROMOTERS WITHIN THE TISSUES OF *POPULAR* CUTTINGS. Res. Rep. Inst. For. Genet., Suwon No. 2: 5-19. 6 refs. [Kor.E.]

Joachim, H. -F. 1960. UBER UNTERSCHIEDLICHES ANWACHSEN "ON PAPPELSECKLINGEN IN PFLANZENSUCHTGARTEN. [DIFFERENCES IN ROOTING AND GROWTH BETWEEN *POPULAR* CUTTINGS IN NURSERIES.] Forst u. Jagd 10(2): 57.61. 4 refs. [G.]

Jovanovic, S. 1961. RESULTATI DEJSTVA NEKIH SINTETICKIH FITOHORMONA NA OZILJAVANJE REZNICA JASIKE (*POPULUS TREMULA* L.) I BELE TOPOLO (*POPULUS ALBA* L.). PRETHODNO ASOPSTENJE. [RESULTS OF THE ACTION OF SOME SYNTHETIC PHYTOHORMONES ON THE ROOTING OF *P. TREMULA* AND *P. ALBA* CUTTINGS. FIRST REPORT.] Sumarstvo 14(9/10): 359-69. 9 refs. [Serb.f.]

Jurhar, F. 1951. RAZMNOZEVANJE KANADSKEGA TOPOLA S POTAKNJENCI. [PROPAGATION OF CANADIAN *POPULAR* BY CUTTINGS.] Gozd. Vestn. 9(8): 177-82. 4 refs. [Sloven.]
General account based mainly on German sources.

Kemmer, C., and Vogl, M. 1960. ANTREIB- UND AUFGUCHTSVERSUCHE AN PAPPEN IM WINTER. [FORCING AND GROWING TESTS ON *POPULARS* IN WINTER.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 47 (Beitr. Pappelforsch. No. 5): 7-26. 13 refs. [G.g.russ.e.]

Kobayashi, T., and Uozumi, T. 1961. [FUNGI FOUND ON DEAD PARTS OF THE TOP OF *POPULAR* CUTTINGS.] J. Jap. For. Soc. 43(7): 263-4. 2 refs. [Jap.]

One-year-old nursery cuttings of 10 poplar species were exam-

ined for fungus attack. The nine fungi identified and their respective hosts are tabulated, with their Latin names.

Koring, Joachim, H. F. 1954. MECHANISIERUNG DES PAPPELSECKLINGSEINSCHNITTES. [MECHANIZED CUTTING OF *POPULAR* CUTTINGS.] Forst u. Jagd 4(12): 446-8. 1 ref. [G.]

Describes a machine equipped with a rotary knife for cutting poplar shoots into cuttings of suitable lengths, developed at the poplar nurseries of Rosenberg, E. Germany. The cut is smoother than a scissor cut, resulting in a conservation of moisture in the cutting, and in a dry spring successful takes were 80-90% for machine-cut vs. 40% for hand-cut material.

Koster, R., and Wijk, A. van. 1963. [PROPAGATING *POPULARS* BY SOFTWOOD CUTTINGS IN THE OPEN.] Ned. Boschb.-Tijdschr. 35(12): 464-9. 6 refs. [D.u.d.e.e.]

Larsen, C. M. 1957. L'ENRACINEMENT INDIVIDUEL DES BOUTURES DE *PEUPLIER*. [INDIVIDUAL ROOTING OF *POPULAR* CUTTINGS.] Zuchter Spec. No. 4: 77-84. 3 refs. [F.f.]

Magnani, G. 1961(1962). UNA NECROSI CORTICALE IN TALEE DI PIOPPO. [A BARK NECROSIS OF *POPULAR* CUTTINGS.] Pubbl. Cent. Sper. Agric. For., Roma 5: 91-109. 12 refs. [It.it.e.e.]

The pathogen responsible for this condition was isolated and identified as *Phomopsis* sp. (probably *P. pallida*). It is apparently favored by even slight drying of the propagation material, and it is therefore advisable to immerse cuttings in water (not cold and stagnant) for 1-2 days before planting.

Matthews, J. D., and Jobling, J. 1961. PROPAGATION OF ELMS AND *POPULARS* FROM SUMMERWOOD CUTTINGS. Extr. from Rep. For. Res. For. Comm., Lond. 1959-60: 180-8. 2 refs.

Partos, G. 1957. NYARFELEKSEMETENEVELESE VEGETATIV "TON. [THE VEGETATIVE PROPAGATION OF *POPULARS*.] Erdesz. Kutatas., Budapest 1957(3/4): 235-56. [Hu.hu.russ.g.e.]

Gives, in the English summary, full details of the optimum quality of cuttings (size, location, method of cutting, etc.), method and time of planting, and spacing.

Piskula, F. 1961. [A STUDY OF THE SUITABILITY OF VARIOUS TOOLS FOR MAKING *POPULAR* CUTTINGS.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 7(2): 187-204. 8 refs. [Cz.cz.russ.g.]

Rubtov, S. 1952. O METODA DE BUTASIRE ORIZONTALA C BUTASI FOARTE SCURTI. [THE WAY TO PLANT VERY SHORT CUTTINGS HORIZONTALLY.] Rev. Padurilor 67(4/5): 29-30. [Rum.rum.russ.]
An experiment was made in horizontal planting of very short (6-10 cm.) poplar cuttings, (a) in trenches 4 cm. deep and (b) in trenches 8-10 cm. deep: (a) gave 46%; and (b) 19%; rooting.

Samsiev, K. 1959. VLIJANIE DIAMETRA CERENKOV NA PRIZIVAE-MOST I ROSTSAZENCEV TOPOLEJ. [THE INFLUENCE OF THE DIAMETER OF *POPULAR* CUTTINGS ON SURVIVAL AND GROWTH.] Lesn. Hoz. 12(2): 69-70. [Russ.]

Schmitz-Lenders, B. 1953. FUSS-STECKLING ODER SETZRUDE BEI DER PAPPELPFLANZEN-ANSUCHT? [SHOOT BASE CUTTINGS OR SETTS IN RAISING *POPULARS*?] Forst u. Holz 8(1): 1-2. [G.]
Summarizes the advantages and disadvantages of cuttings without terminal buds (shoot base cuttings) and setts.

Sekawin, M. 1953. CONFRONTO FRA UN VIVAIO DI PIOPPO IMPIANTATO CON TALEE E UNO IMPIANTATO CON BARBATELLE. [COMPARISON OF A NURSERY PLANTED DIRECTLY WITH CUTTINGS AND ONE PLANTED WITH CUT-BACK ROOTED CUTTINGS.] In Studie Ricerche sulla Pioppicoltura, Entenazionale per la Cellulosa e per la Carta, Rome Pp. 21-7. [It.]

It was found that by planting poplar cuttings in a temporary nursery, lifting them at the end of the year, and cutting back before planting out in the nursery beds, plants of better form were obtained and establishment was 88.6% compared with 56.1% for cuttings planted directly in the nursery.

Smith, J. H. G. Haddock, P. G., and Hancock, W. V. 1956. TOPOPHYSIS AND OTHER INFLUENCES ON GROWTH OF CUTTINGS FROM BLACK COTTONWOOD (*POPULUS TRICHOCARPATA*) AND CAROLINA *POPULAR* (*P. CANADENSIS* VAR. *EUGENII*). J. For. 54(7): 471.2. 4 refs.

Strzelecki, W. 1955. Z BADAN NAD WPLYWEM STYMULATOROW WZROSTU NA UKORZENIANIE SIE ZRZESZOW TOPOLI. [INVESTIGATIONS

ON THE EFFECT OF GROWTH STIMULANTS ON THE ROOTING OF POPLAR CUTTINGS.] Sylwan 99(2):160-6. 4 refs.[Pol.]

Suszka, B. 1963. [SURVIVAL AND DIMENSIONS OF ONE-YEAR POPLAR PLANTS IN RELATION TO THE LENGTH OF THE CUTTINGS AND THEIR LOCATION IN THE SHOOT.] Arbor. Kornickie, Poznan 8: 221-46. 17 refs.[Pol.pol.russ.e.e.]

Takagi, T. 1953. EFFECTS OF EXTERNAL H-ION CONCENTRATION ON ROOTING RESPONSES OF POPLAR STEM CUTTINGS IN NUTRIENT SOLUTIONS. J. Jap. For. Soc. 35(10):309-12. 6 refs.[E.e.jap.]

Vamos, R., and Vida, L. 1963. [THE USE OF GROWTH REGULATORS FOR ACCELERATING THE ROOTING OF POPLAR CUTTINGS.] Erdo 12(2): 61-6. [Hu.russ.g.]

Both IAA and 2,4-D stimulated rooting. The former at 70 mg./litre can be applied with excellent results but the 2,4-D had side effects precluding its use. [Cf. Joachim, 1960, this subject classification.]

Vasilev, A. E. 1962. [THE EFFECT OF STIMULANTS ON CALLUS ACTIVITY.] Lesn. Z., Arhangel'sk 5(3): 31-2. 3 refs. [Russ.]

Vill. 1931. [SELECTION AND BEHAVIOR OF POPLAR CUTTINGS.] Mitt. Dtsch. Dendrol. Ges. 43: 324.

Walter, and Piesneck. 1957. UNTERSUCHUNGEN UBER VERSCHIEDENES SETZEN DER PAPPERSTECKLINGE. [TESTING DIFFERENT WAYS OF PLANTING POPLAR CUTTINGS.] Forst u. Jagd Spec. No. Die Pappel 2: 15-6. [G.]

Plants grown from cuttings buried vertically in the soil so that the top was covered with 1 to 2 cm. of soil exceeded in survival percent. height, weight of foliage and diameter growth those cuttings planted with the top bud protruding 1 to 2 cm. above ground (R. H. Muller's method as recommended in the "Pappelbuch" [cf. Hesmer, 1951, Populus sp., 0]).

Wareing, P. F., and Smith, N. G. 1963. PHYSIOLOGICAL STUDIES ON THE ROOTING OF CUTTINGS. Extr. from Rep. For. Res. For. Comm., Lond. 1961362: 120, 124.5.

Waterman, A. M. 1954. SURFACE STERILIZATION OF HYBRID POPLAR CUTTINGS. U. S. For. Serv. Ntheast. For. Exp. Sta. Res. Note No. 32, 3 pp. 2 refs.

——— and Aldrich, K. F. 1952. SURFACE STERILIZATION OF POPLAR CUTTINGS. U. S. Dep. Agr. Plant Dis. Repr. 36(5):203-7. 7 refs.

——— and Aldrich, K. F. 1954. ADDITIONAL INFORMATION ON THE SURFACE STERILIZATION OF POPLAR CUTTINGS. U. S. Dep. Agr. Plant Dis. Repr. 38(2):96-100.

Wechselberger. 1953. FUSS-STECKLING ODER SETZRUTE BEI DER PAPPELPLANZENANZUCHT. [SHOOT-BASE CUTTINGS OR SETTS IN RAISING POPLARS.] Forst u. Holz 8(5): 60.2. [G.]
Comments on the article by Schmitz-Lenders [1953, this subject classification].

232.328.5

Bokor, R. 1952 (1954). UJAGROTECHNIKAI MODSZER AZ IPARILAG ERTEKES F A T ADO U. N. NEMES NYARAK TENYESZTERULETENEK A KITERJESZTESERE A SZARAZABB TERMOHELYEK FELE. [A NEW METHOD FOR EXTENDING THE USE OF ECONOMICALLY VALUABLE POPLAR SPECIES TO DRIER AREAS.] Erdesz. Tud. Int. Evk., Budapest 2: 78-89. 4 refs. [Hu.russ.e.g.]

Gancev, P. 1957. VARHU OTZIVCIVOSTTA NA NJAKOI VIDOVE TOPOLIKAMPRI SAZDANE. [THE REACTION OF SOME POPLAR SPECIES TO GRAFTING.] Izv. Inst. Gorata Balg. Akad. Nauk., Sofia No. 2: 121-42. 15 refs. [Bulg.bulg.russ.g.]

Lustig, E. 1956. VEGETATIVE VERMEHRUNG VON WERTHOLZERN IN DER FORSTWIRTSCHAFT. [VEGETATIVE PROPAGATION OF VALUABLE TIMBERS.] Forstarchiv 27 (7): 154-7. [G.]
Describes graftings of scions from elite ash, on minus rootstocks, and the propagation. by grafting or budding, of material from individual poplars and maples with figured grain.

Pospisil, J. 1958. O AFINITE MEZI OSIKOU P TREMULA L. 4 NEKTERYMI DALSIMI JEDINCI RODU POPULUS. [ON THE AFFINITY BETWEEN POPULUS TREMULA AND SOME OTHER REPRESENTATIVES OF

THE GENUS POPULUS.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 4(11):1005-16. 10 refs. [Cz.cz.russ.e.]

Schonbach, H. 1960. BEOBACHTUNGEN AN HETEROPLASTISCHEN PFROPFUNGEN INNERHALB DER GATTUNG POPULUS. [HETEROPLASTIC GRAFTING WITHIN THE GENUS POPULUS.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 47 (Beitr. Pappelforsch. No. 5): 27-41. 5 refs. [G.g.russ.e.]

232.329.9

Chen, Y.-M. 1962. [THE EFFECT OF GIBBERELLIN ON THE GROWTH OF POPLARS.] Lesn. Hoz. 15(12): 45-7. [Russ.]

232.4

Anonymous. 1941. ANPFLANZUNG UND KULTUR DER PAPPEL. [PLANTING AND CULTIVATION OF POPLAR.] Wbl. Papierfabrik. 72 (9): 114-8. Abstr. in Holz 4: 262. 1941. [G.]

——— 1948. POPLAR PLANTING. Leaflet. For. Comm., Lond. No. 27, 14 pp.

Barbey, A. 1941. LA PLUS GRANDE PEUPLERAIE D'EUROPE. [THE LARGEST POPLAR PLANTATION IN EUROPE.] J. For. Suisse 92(7): 141-7. [F.]

Berta, F. 1959. NEHANY ADAT A PUSZTAVACSI ERDESZET NEMESNYARTELEPITÉSÉIRŐL. [POPLAR GROWING IN THE PUSZTAVACS FOREST DISTRICT.] Erdo 8(4):144-8. [Hu.russ.g.]

Describes the planting, 1935-40, of 250 ha. of selected exotic poplars ("Edelpappeln"), ground preparation being 60- to 70-cm-deep plowing with steam plows and planting at 1.5 x 1.5 m. The first tending was combined with agricultural intercropping; the first thinnings came after the 1945 liberation.

Bull, H., and Putnam, J. A. 1940. EARLY SURVIVAL OF COTTONWOOD AND HYBRID POPLAR PLANTATIONS AT STONEVILLE, MISSISSIPPI. U. S. For. Serv. South. For. Exp. Sta. Occ. Pap. No. 94, 7 pp.

de Cherisey. 1931. NOTE ON POPLAR PLANTATIONS IN FRANCE. Bull. Corn. For., Paris 49.

Franco. 1932. PLANTING OF POPLARS IN ITALY. Rev. Eaux For. 70: 143.

Johnsson, H. 1943. POPPELKULTURER-INTRYCK FRÅ EN STUDI-ERESA TILL BELGIEN OCH SYN- PUNKTER PÅ POPPEL I SVENSK SKOGSBRUK. [POPLAR PLANTATIONS: IMPRESSIONS FROM A STUDY TOUR TO BELGIUM AND VIEWS ON THE POPLAR IN SWEDISH FORESTRY.] Svensk PappTidn. No. 9: 208-14. [Sw.] Plant Breed. Abstr. 14: 322. 1944.

Leather. 1927. A CHEAP FORM OF PLANTING [POPLAR CUTTINGS]. Quart. J. For. 21: 22.

Leslie, A. S. 1919. PLANTING OF POPLARS AT KININVIE. Trans. Scot. Arbor. Soc. 33: 71.

Lotbiniere. 1932. POPLAR PLANTATIONS IN ENGLAND. Quart. J. For. 26: 212.

Muller, R. 1958. DREI HILFEN FÜR DEN PAPPELANBAU. [THREE HELPFUL RECOMMENDATIONS FOR POPLAR PLANTING.] Allg. Forst-zeitschr. 13(8): 94-6. [G.]

Piccarolo, G. 1950. IL PIANTAMENTO DEL PIOPPO. [POPLAR PLANTING.] Ital. For. Mont. 5(6):214-9. [It.f.e.]

Sarce. 1903. NOTE ON POPLAR PLANTATIONS IN BELGIUM. Bull. Soc. For. Belg. 10: 94.

Schmitz-Lenders, B. 1951. ANWEISUNG FÜR DIE AUSFÜHRUNG "ON PAPPELANPFLANZUNGEN INNERHALB UND AUSSERHALB DES WALDES SOWIE FÜR DIE HANDHABUNG DER PAPPEL-STAMMPFLEGE. [DIRECTIONS FOR MAKING POPLAR PLANTATIONS BOTH WITHIN AND WITHOUT THE FOREST AND FOR TENDING THE TREES.] Forst u. Holz 6(5): 65-6. [G.]

Smith. 1925. PLANTING IN DENMARK. Forstl Forsogsv. Danm. 9: 3.

[US A South. For. Exp. Sta.] 1947. [COTTONWOOD PLANTATION TECHNIQUE] U. S. For. Serv.. Rep. South For. Exp. Sta. 1946 1415.

Vachat, F. du. 1939. PLANTATIONS OF POPLAR IN THE MARSH OF LA CHAUTAGNE (SERIAL). Rev. Eaux For. 77(4): 306-317. [F.]

1939. THE POPLAR PLANTATIONS IN THE MARSH OF LA CHAUTAGNE (CONCLD.). Rev. Eaux For. 77(5): 403-413. [F.]

232.41 1.1

[Argentina: Mundo Maderero] 1958. CONTROL VARIETAL DE ALAMOS Y SAUCES. [CONTROL OF POPLAR *ND WILLOW VARIETIES.] Mundo Maderero 18(215): 10. [Span.] Discusses the recommendations of the Comision Nacional del Alamo, Argentina, designed to ensure that only good clones and varieties of poplar and willow planting stock, of known origin, are offered for sale. Clones recommended for planting in certain regions of Argentina, and for certain sites (e.g. along the sides of watercourses, etc.), are listed.

[Italy: Cellulosa e Carta] 1963. [STANDARDS FOR THE IDENTIFICATION, AUTHENTICATION AND GUARANTEEING OF MATERIAL FOR VEGETATIVE PROPAGATION AND PLANTING STOCK OF POPLARS.] Cellulosa e Carta 14(5): 3-5 [It.]

Standards drawn up by the executive committee of the Italian National Poplar Commission, which has recently instituted a register of poplar clones.

232.41 1.4

Cram, W. H. [1958.] 1957 REPORT ON BREEDING AND NURSERY RESEARCH. Dom. For. Nursery Sta. Sask. 6 pp. 2 refs.

[U.K.: For. Comm.] 1956. THE QUALITY OF POPLAR PLANTS. Leaflet For. Comm., Lond. No. 39, 8 pp. Describes different types of planting stock (1-year rooted cuttings, ditto stumped and transplanted for 1 year (C, + S), C, + S₂, and unrooted setts), and methods of raising and handling them.

232.412

Jobling, J. 1960. EXPERIMENTS ON THE HANDLING OF POPLAR PLANTING STOCK. Extr. from Rep. For. Res. For. Comm., Lond. 1958/59: 161-7.

232.421

Meiden, H. A. van der. 1963. [THE SIZE OF PLANTING HOLES FOR POPLARS OVER ONE YEAR OLD.] Ned. Boschb.-Tijdschr. 35(11): 445-9. 1 ref. [Dut.]

Nerinx, E. 1952. A PROPOS D'UNE PLANTATION DE PEUPLIERS A L'AIDE D'EXPLOSIFS. [PLANTING POPLARS WITH THE HELP OF EXPLOSIVES.] Bull. Soc. For. Belg. 59(8/9): 400-4. [F.]

Podhorski, I. 1960. KAPTAZNI UZGOJ TOPOLA U PLANTAZAMA. [THE CHANNEL AND DRAIN METHOD OF RAISING POPLAR IN PLANTAZAMA.] Sum. List 84(7/8): 220-2. [Croat.g.]

232.425.2

Pfort, E. 1957. ERGEBNISSE EINIGER DÜNGUNGS- UND STARTVERSUCHE ZU PAPPEL, ROTEIFCHE UND DOUGLASIE. [SOME FERTILIZER *ND STARTING TRIALS ON POPLAR, RED OAK *ND DOUGLAS FIR.] Forst- u. Holzw. 12(7): 111-4. [G.]

232.427

Giacomelli, C. 1956. UN ATTREZZO PER IL RAPIDO PIANTAMENTO DELLE PIOPPELLE E DELLE TALEE DI PIOPPO. [AN IMPLEMENT FOR THE RAPID PLANTING OF POPLAR CUTTINGS AND YOUNG TREES.] Agricoltura Delle Venezie, Venezia 10(1): 31-7. [It.]

232.43

Anonymous. 1951. LA DENSITE DES PEUPLERAIRES. [THE SPACING OF POPLAR PLANTATION.] Action For. Pisc. No. 160: 1-2. [F.] A discussion, by several correspondents, of the various biological and economic factors involved in the choice of spacing.

Georgopoulos, A. 1952. BEITRAG ZUR WAHL DES PFLANZVERBANDES BEI PAPPELKULTUREN. [THE SPACING OF POPLAR PLANTATIONS.] Schweiz. Z. Forstw. 103(6/7): 212-24. 12 refs. [G.f.] Experience in Greece has shown that close spacing followed by thinnings is best both financially and silviculturally. On good sites a spacing of 2 x 2 m. is recommended, and on inferior sites, particularly on sandy soils, 3 x 4 m.

Herbignat, A. 1954. AVIS AUX PLANTEURS DE PEUPLIERS: DISTANCES A ADOPTER DANS LES PLANTATIONS. [ADVICE ON PLANTING POPLARS: SPACING IN PLANTATIONS.] Bull. Soc. For. Belg. 61(2): 92-107. [F.]

Miletic, S. 1961. PLANTACIJE TOPOLA NA POPLAVNOM PODRUCJU U GUSTO., I RETKOJ SADNJI. [POPLAR PLANTATIONS ON PERIODICALLY FLOODED LAND AT CLOSE *ND WIDE SPACINGS.] Topola, Beograd 5(24): 6-8. [Serb.f.]

Gives data on height and diameter increment over 4 or 6 growing seasons for 11 species or clones of poplar near the Danube at Bilje. Poplars planted at 2.5 x 2.5 m. had a mean height of 13.44 m. and d.b.h. of 14.33 cm. after 6 growing seasons vs. 15.12 and 20.73 for those at 5 x 5 m. The plots are being maintained to see which spacing gives the best return.

Trifunovic, D. 1961. ISTRAZIVANJA UTICAJA GUSTINE NA UKUPNI PRIRAST DEBLJINE I ZAPREMINE U SASTOJINAMA TOPOLA NA PODRUCJU PODUNAVLJA BACKE, BANATA, POTISJA I POSAVINE DONJEG SREMA. [RESEARCH INTO THE EFFECT OF POPLAR STAND DENSITY ON TOTAL DIAMETER *ND VOLUME INCREMENT IN THE DANUBE REGION OF BACK *ND BANAT, *ND THE TISA AND SAVA REGIONS OF LOWER SREM.] Sumarstvo 14(11/12): 465-84. 10 refs. [Serb.f.]

232.5

Cunningham, F. E. 1954. METHODS OF ESTABLISHING PLANTATIONS OF HYBRID-POPLAR CUTTINGS. U.S. For. Serv. Northeast. For. Exp. Sta., Sta. Pap. No. 66, 10 pp. 10 refs.

Gjulumamedov, R. G. 1957. VYRASCIVANIE NASAZDENIJ BYSTRO-RASTUSCHIH POROD NA OROSAEMYH ZEMLJAH MIL SKOJ STEP I PUTEM POSADKI CERENKO. [GROWING STANDS OF QUICK-GROWING SPECIES BY DIRECT PLANTING OF CUTTINGS ON IRRIGATED LAND ON THE MILSK STEPPE.] Bjulleten Naucno-Tehniceskoj Informacii Azerbajdzanskogo Naucno-Issledovatel Skogo Instituta Lesnogo Hozjajstva i Agrolesomelioracii 1957(1/2): 35-9. [Russ.] From abstr. in Referat. Z. (Biol.) 1958(4), No. 1540.5. [Russ.]

Marton, T. 1961. DUGWANYOZASSAL TORTENT NYARTELEPITES TAPASZTALATAI A KOZEPSOMOGYI HOMOKON. [EXPERIENCE WITH CUTTINGS IN POPLAR CULTIVATION ON SAND IN CENTRAL SOMOGY.] Erdő 10(12): 514-8. 5 refs. [Hu.russ.g.]

Following 50-60% damage by Saperda populnea to transplants and very little to cuttings in 1959, the latter are now preferred. Planting them in mixture (five varieties are named) is a mistake as otherwise resistant varieties get infected with Melampsora populi, though canker is generally absent.

Podhorski, I. 1955. O RAZMNAZANJU TOPOLA MOTKAMA. [PROPAGATION OF POPLAR BY SETTS.] Sum. List 79(9/10): 281-92. 9 refs. [Croat.croat.e.]

Schlenker, G. 1957. VERSUCHE MIT PAPPELSETZSTANGEN AUF SCHWEREM MERGELTONBODEN DES GIPSKEUPERS. [TRIALS WITH POPLAR SETTS ON A HEAVY MARLY-CLAY SOIL ON THE GYPSUM KEUPER.] Mitt. Ver. Forstl. Standortskunde Forstpfl. Zucht. No. 6: 63-4. [G.]

233 AFFORESTATION

Azy, B. D. 1947. BOISEMENT ET ENRICHISSEMENT DE LA FORET PAR LE PEUPLIER. [AFFORESTATION AND THE ENRICHMENT OF THE FOREST BY THE USE OF POPLARS.] Action For. Pisc. No. 116: 1. IF.1

Damke-Hornburg. 1954. PAPPELANBAU AUCH AUF STEIN- UND GEROLLHALDEN. [PLANTING POPLARS ON QUARRY SPOIL MOUNDS AND BOULDER BANKS.] Forst- u. Holzw. 9A(6): 122-3. [G.]

[Germany: Hilfe Durch Grün] 1960. LANDSCHAFT UND TAGEBAU. [LANDSCAPE *ND OPEN-CAST WORKING, INCLUDING QUARRYING.] Hilfe Durch Grün, Darmstadt No. 9, 64 pp. Several refs. [G.]

Gunther, H. 1956. UNTERSUCHUNGEN ÜBER DIE VERWENDUNG VON PAPPELSTECKLINGEN ZUR KIPPENKULTIVIERUNG IN DER NIEDERLAUSITZ. [THE USE OF POPLAR CUTTINGS FOR THE REVEGETATION OF SPOILMOUNDS IN THE NIEDERLAUSITZ.] Wiss. Abh. Dtsch. Akad. Landw. Berlin No. 16 (Beitr. Pappelforsch. No. 1): 51-70. 6 refs. [G.g.]

Hieronymus, H. 1956. BIOLOGISCHE MELIORATIONEN DURCH PERENNIERENDE LUPINE BEI DER REKULTIVIERUNG "ON BRAUNKOHLN-

KIPPEN. [BIOLOGICAL SOIL IMPROVEMENT BY PLANTING PERENNIAL LUPINS IN CONNECTION WITH THE REVEGETATION OF LIGNITE SPOIL-MOUNDS.] Forst u. Jagd 6(10): 465-6. [G.]

Good results were obtained in the Leipzig region by interplanting poplars, after cultivation, with perennial lupins. Planting the poplars as cut-back 1-year stock has proved successful and has reduced wind damage.

[International: FAO/For. Equipm. Note] 1961. POPLAR PLANTING ON SAND DUNES. For. Equipm. Note, FAO No. A.2 Tec. 61, 1 p.

Krolkowski, L., and Strzelc, Z. 1961. [TRIALS WITH SOME SPECIES AND FORMS OF POPLAR PLANTS IN AFFORESTING SANDY SOILS.] Roczn. Gleboznawcze, Warsz. 10 (Suppl.): 722-3. [Pol.]

Morgrneyer, W. 1961. ZUR VERWENDUNGSMOGLICHKEIT "ON PAPPEL" "ND FLECHTWEIDEN BEIDER REKULTIVIERUNG NIEDERLAUSITZER BRAUNKOHLENKIPPEN. [THE USE OF POPLARS AND OSIER WILLOWS FOR THE REVEGETATION OF LIGNITE SPOIL MOUNDS IN THE NIEDERLAUSITZ REGION.] Forst u. Jagd 11(8): 344-7. 10 refs. [G.g.] Summarizes results of research and experience as to planting methods, effect of fertilizers, and suitable varieties, with special attention to drought hardiness.

Stachy, J. 1960. ZADRZEWIANIE HALD POWEGLOWYCH W NIEMIECKIEJ REPUBLICIE DEMOKRATYCZNEJ [AFFORESTATION OF COAL-MINE SPOIL-MOUNDS IN E. GERMANY.] Sylwan 104(8): 35-44. 3 refs. [Pol.]

An account of experience at two sites, *Laubusch* (since 1949) and *Mohlau* (since 1926), mainly with poplars.

Tikos, B. 1938. [AFFORESTATION EXPERIMENTS ON "SZIK"-SOILS -CHIEFLY WITH POPLARS ON INLAND ALKALINE SOILS.] Erdesz. Lapok. 77(6): 514-21. [Hu.g.f.e.]

Toth, K. 1960. ALFOLDASITAS-NYARFASITAS SZOLNOK MEGYE-BEN. [AFFORESTATION AND POPLAR PLANTING ON THE HUNGARIAN GREAT PLAIN IN SZOLNOK COUNTY.] Erdo 9(5): 191-9. 5 refs. [Hu.russ.g.]

Since 1945 the forest area has been raised from 0.47 to 3.20%. Afforestation by area has been 51% pedunculate oak, 21% poplar, and robinia 10%. The poplars preferred are *P. × robusta*, *P. nigra* var. *italica*, and *P. × regenerata*.

[U.S.A.: Ntheast. For. Exp. Sta.] 1959. PLANTING ON COAL-STRIPPED LAND. U. S. For. Serv. Rep. Ntheast. For. Exp. Sta. 1958: 19-20.

235 UNDERPLANTING, ADVANCE PLANTING, ETC. NURSES AND FORMATION OF MIXTURES

Danszky, I., Rimler, L., and Rott, F. 1959. AGODOLLOITAPASZTALATCSERETANULSAGAI [CONCLUSIONS DRAWN FROM AN EXCHANGE OF EXPERIENCES.] Erdo 8(12): 461-6. [Hu.]

Discusses the increasing of productivity by using shorter rotations, widely spaced "intermediate stands," e.g., poplars planted before or with a main stand of pines. From *abstr. in Hung. Agric. Rev.* 9(2): 17. 1960 [E.]

235.41

Costin, E. 1958. EFECTUL STIMULATOR AL ANINULUINEGRU (ALNUS GLUTINOSA GAERTN.) ASUPRA CRESTERII SPECILOR LEMNOASE FE NISIPURILE FLUVIO-MARITIME. [THE STIMULATING EFFECT OF A. GLUTINOSA ON THE GROWTH OF WOODY SPECIES ON FLUVIO-MARITIME SANDS.] Rev. Padurilor 1958(10): 573-7. 12 refs. [Rum.russ.g.f.e.]

Meidcn, H. A. van der. 1961. DE ELS IN POPULIERENBEPLANTINGEN. [ALDER IN POPLAR PLANTATIONS.] Ned. Boschb.-Tijdschr. 33(6): 168-71. 3 refs. [Du.e.g.]

235.42

Ford, H. F., Williamson, M. J., and Cunningham, F. E. 1952. COVER CROPS NO SUBSTITUTE FOR CULTIVATION IN HYBRID POPLAR PLANTINGS. U. S. For. Serv. Ntheast. For. Exp. Sta. Res. Notes No. 14: 1-4.

[U.S.A.: Ntheast. For. Exp. Sta.] 1950. COVER CROPS FOR HYBRID POPLAR PLANTATIONS. U. S. For. Serv. Rep. Ntheast. For. Exp. Sta. 1949. 11.

235.5

Zmijanac, D. 1960. NEKESMJERNICE ZA PLANTAZNI UZGOJ SUM-SKOG DRVECA. [SOME DIRECTIONS FOR RAISING FOREST TREES IN PLANTATIONS.] Sum. List 84 (11/12): 371-8. [Croat.c.]

236 CARE OF REGENERATION OR PLANTATIONS IN THE INITIAL STAGES OF ESTABLISHMENT

Anonymous. 1935. DIE NACHZUCHT VON PAPPEL "ND BAUMWEIDE IN "EN BADISCHEN AU EWALDUNGEN. [THE AFTER-CULTIVATION OF POPLAR AND WILLOW IN THE MEADOW WOODLANDS OF BADEN.] Forstablgt. Badischen Finanz-u. Wirtschaftsministeriums. 16 pp.

Geisler, G. 1953. EINIGES ZUR FRAGE "ES PAPPELANBAUS "ND DER DRINGEND NOTWENDIGEN SCHUTZMASSNAHMEN FUR DIE PAPPEL. [THE PROBLEM OF POPLAR PLANTING AND THE URGENCY OF PROTECTIVE MEASURES.] Wald 3(9): 272-4. [G.]

Discusses the reasons for the frequent failures of recent plantings in Mecklenburg, estimated at 75% of all poplars planted since 1945, and stresses the need for correct choice of site and for tending in early years.

236.1

Jovanovic, S. 1959. UNISTAVANJE KUPINE (RUBUS CAESIUS L.) I BAGREMCA (AMORPHA FRUTICOSA L.) U POPULIKULTURI HERBICIDIMA. [CONTROL OF R. CAESIUS AND A. FRUTICOSA IN POPLAR PLANTATIONS WITH HERBICIDES.] Zast. Bilja No. 54: 53-67. 9 refs. [Serb.e.]

A longer version of an article listed below.

1960. DEJSTVO NEKIH HERBICIDA NA VAZNIJE KOROVE U POPULIKULTURI. [THE ACTION OF SOME HERBICIDES ON IMPORTANT WEEDS IN POPLAR PLANTATIONS.] Topola, Beograd No. 15: 15-9. [Serb.f.g.]

Milewski, J. 1957. UPRAWA I PIELEGNACJAGLEBY POD PLANTACJAMI TOPOLOWYMI. [CULTIVATION AND TENDING OF SOIL UNDER POPLAR PLANTATIONS.] Las Polski, Warsz. 31 (15/16): 3-5. [Pol.]

236.1, 3

Maran, B., and Lhota, O. 1952. BUREN-NAS NEJVETSI NEPRITEL PRIZALESNOVANIA ZAKLADANIOCHRANNYCH LESNICH PAS". [WEEDS—OUR GREATEST ENEMY IN AFFORESTATION AND IN ESTABLISHING FOREST SHELTERBELTS.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 25(1/2): 39-54. 11 refs. [Cz.russ.]

237 AMELIORATION OF FOREST SITES

Guerreiro, M. G. 1944. ASPECTOS ACTUAIS DA SILVICULTURA: O MELHORAMENTO. [PRACTICAL ASPECTS OF SILVICULTURE: FOREST AMELIORATION.] Agros, Lisboa 27(3/6): 150-7. [Port.]

237.4

[Belgium] 1953. LE PHOSPHATE THOMAS EN SYLVICULTURE. [THE "SE OF BASIC SLAG IN FORESTRY.] Services Agronomiques des Producteurs de Phosphate Thomas, 47 Cantersteen, Brussels. 40 pp.

Deals for the most part with the Sart-lez-Spa experiment in fertilizing spruce but also gives some notes on the effects of applying basic slag at time of planting on fruit trees and poplars.

Chardenon, J. 1960. ETUDE DE L'ACTION DE DIVERS ENGRAIS. [FERTILIZER STUDIES.] Bull. Serv. Cult. Etud. Pcuplier ct Saule, Paris 1960(1): 1-9. [F.]

Felcourt, E. de. 1936. THE APPLICATION OF FERTILIZER TO POPLAR PLANTATIONS. C.R. Acad. Agric. France 22: 657.62. I.B.S.S. publ. relating to soils and fertilizers No. 64, p. 14. 1936.

Ithier, H. 1947. LA FUMURE DU PEUPLIER EST-ELLE RENTABLE? [DOES MANURING OF POPLARS PAY?] La Potasse, Mulhouse 21 (149): 186-8. 3 refs. [F.]

Mayer-Krapoll, H. 1956. DIE ANWENDUNG VON HANDELSDUNGEMITTELN INSBESONDERE VON STICKSTOFF IN DER FORSTWIRTSCHAFT. [THE USE OF COMMERCIAL FERTILIZERS, PARTICULARLY NITROGEN, IN FORESTRY.] Ruhr-Stickstoff Aktiengesellschaft, Bochum. 126 pp. 112 refs. [G.]

1956. THE USE OF COMMERCIAL FERTILIZERS—PARTICULARLY NITROGEN IN FORESTRY. Nitrogen Div., Allied Chem.

and Dye Corp., New York. 111 pp. 112 refs.

Transl. from *Die Anwendung von Handelsdüngemitteln insbesondere von Stickstoff in der Forstwirtschaft. Ruhr-Stickstoff Aktiengesellschaft, Bochum.*

Meidcn, H. A. van der. 1962. DIE DÜNGUNG DER PAPPEL. [FERTILIZING POPLARS.] *Forstarchiv* 33(4): 69-72. 7 refs. [G.]

———. 1962. THE FERTILIZATION OF POPLARS. Commonwealth Forestry Institute, Oxford. BNB/U.K./Transl. No. 2600, 8 pp. Transl. by E. W. Jones from *Forstarchiv* 33(4): 69-72. 1962.

Van Tilt. 1928. GROWTH OF CANADIAN POPLAR AND USE OF FERTILIZER. *Bull. Soc. For. Belg.* 31: 76.

237.41

Contant, P. 1957. ESSAIS DE FUMURE SUR PEUPLIERS. [FERTILIZER TRIALS IN POPLAR PLANTATIONS.] *Potasse, Mulhouse* 31(249): 199-202. [F.]

Sekawin, M. 1960. NOTIZIE SULLA CONCIMAZIONE DEL PIOPPETO. [FERTILIZING POPLAR PLANTATIONS.] *Cellulosa e Carta* 11(5): 5-8. 8 refs. [It. it. f. e. g.]

Briefly reviews the literature and concludes that fertilizers are more effective when spread over the whole area rather than applied locally, and that best results are achieved by the use of a balanced NPK fertilizer.

237.417

Hilf, H. H., and Becher, R. 1962 and 1963. [THE VORWERKS-BUSCH EXPERIMENTAL AREA. I. OBJECTS AND HISTORY. II. SHELTER-BELTS AND WINDBREAKS. III. FERTILIZING AND SOIL CULTIVATION WHEN GROWING TIMBER OUTSIDE THE FOREST.] *Holzzucht, Reinbek* 16(3): 19-23; 17(1/2): 5-14. 8 refs. [G.]

237.43

Iturralde Irigoyen, A. 1963. [USE OF WASTE LIQUORS FROM SUGAR REFINERIES FOR SOIL IMPROVEMENT ON RIVER BANKS.] *Montes, Madrid* 19(112): 335-7. [Span.]

Koch, W. 1958. VON FRANZÖSISCHER PAPPELWIRTSCHAFT. [POPLAR GROWING IN FRANCE.] *Allg. Forstzeitschr.* 13(7): 78-9. [G.] A brief illustrated report of a study tour, including a description of the sewage disposal farm of Rheims, in which the water from the city sewers, including factory effluents, are used to irrigate a poplar plantation of 115 ha., begun in 1929, which shows a mean annual yield of ca. 14.5 cu.m.

238 TIMBER PLANTATION CROPS REQUIRING SPECIAL TREATMENT

Allegri, E. 1953. SUMMARY REPORT TO THE GOVERNMENT OF IRAQ ON POPLAR CULTIVATION. FAO, Rome. FAO/ETAP No. 8, 11 pp.

Anschutz, R. 1958. PAPPELANBAU INNERHALB UND AUSSERHALB DES WALDES IN DER PFALZ. [POPLAR GROWING INSIDE AND OUTSIDE THE FOREST IN THE PALATINATE.] *Forst- u. Holzw.* 13(2): 25-30. [G.]

A lecture on practical experiences with poplars both native and cultivars, largely in the forests of the flood-plains of the Rhine and its tributaries, including some figures on the extent of plantings, improvement of yield in such forests, etc., but also setbacks and disappointments.

Bauer, F. 1957. DIE AUFBRINGUNG VON PAPPELFASERHOLZ. [THE PRODUCTION OF POPLAR PULPWOOD.] *Holz-Zbl.* 83(36): 481-3. [G.]

Becking, J. H. 1954. OMLOOPSTIJD EN DUNNING "AN WIJDEGE-PLANTE" POPULIEREN CULTUREN IN NEDERLAND. [ROTATION AND THINNING OF WIDELY SPACED POPLAR PLANTATION IN THE NETHERLANDS.] *Ned. Boschb.-Tijdschr.* 26(3): 57-65. 4 refs. [Du. g.]

Belgioioso, G. B. di. 1959. LA PIOPICOLTURA NEL LODIGIANO. [POPLAR-GROWING IN THE PLAIN OF LODI.] *Monti e Boschi* 10(9): 475-85. [It. f. e.]

An account of the extensive plantations, with statistical data on area, increment, etc.

Beltram, V. 1953. VECJO POZORNOST GOJENJU TOPOLOV! [MORE ATTENTION TO POPLAR CULTIVATION!] *Gozd. Vestn.* 11(5): 129-32. [Sloven.]

A general account of poplar growing in Slovenia, with description of silvicultural methods to be adopted with poplar (*Populus "canadensis"*).

Buchwald, K. 1951. BRUCHWALDGESELLSCHAFTEN IM GROSSEN UND KLEINEN MOOR, FORSTAMT DANNDORF (DROMLING). [FENLAND FOREST COMMUNITIES ON THE GROSSE AND KLEINE MOOR, DANNDORF (DROMLING) FOREST DISTRICT.] *Angew. Pfl. Soziol., Stolzenau* No. 2, 46 pp. 17 refs. [G.]

Introductory sections on site factors, silvicultural and hydrological problems, followed by details of communities recognized (variants of the *Alnetum glutinosae* and *Betuletum pubescentis*) and soils (fen and bog types) in relation to groundwater level and composition, concluding with notes on poplar-growing on such sites and hydrological tasks.

Bura, D. 1962. [POPLAR PLANTATIONS WITH FIELD CROPS.] *Sum. List* 86(9/10): 297-316. [Serb. e.]

Chianesc, L. 1951. POSSIBILITÀ DI SVILUPPO DELLA PIOPICOLTURA IN TOSCANA. [POSSIBILITIES OF GROWING POPLAR IN TUSCANY.] *Ital. For. Mont.* 6(5): 239-43. [It. it. f.]

Claudel, Y. 1960. LES PLACEMENTS FORESTIERS. [FOREST INVESTMENT.] *Bois Français de Papeterie, Paris*. 22 pp. 2 refs. [F.] The author's aim is to indicate the possible returns on investment, with special reference to poplar plantations, and also the assistance available from the Fonds Forestier National in the form of loans, credits, subsidies, etc.

[Estonia: Eesti NSV Tead. Akad.] 1962. SALUMETSADE MAJANDAMISE KÜSIMUSI. [SILVICULTURE OF BROADLEAVED AND BROAD-LEAVED/ CONIFER STANDS.] *Eesti NSV Teaduste Akadeemia (Zool. Bot. Inst.), Tartu*. 190 pp. Many refs. [Est. russ. g.]

G., H. 1952. RICHTLINIEN FÜR DEN PAPPELANBAU DURCH DIE LANDSCHAFTSPFLEGE. [DIRECTIVES FOR THE PLANTING OF POPLARS UNDER THE "LANDSCHAFTSPFLEGE" ORGANIZATION.] *Wald* 2(4): 102-5. [G.] Covers recommendations on planting, site selection and choice of species, tending and primary conversion in E. Germany.

Ganza, M. T. 1962. [POPLAR PLANTATIONS IN THE FLOODPLAINS OF SMALL RIVERS IN THE UKRAINE.] *Lesn. Z., Arhangel'sk* 5(5): 50-4. 4 refs. [Russ.]

Presents mensurational data for some *Populus* × *'canadensis'* and *P. nigra* stands, and makes recommendations on sites, silviculture and management.

Georgopoulos, A. 1959. L'ESPACEMENT DANS LA PLANTATION DE PEUPLIERS ET LA POPULICULTURE INTENSIVE. [SPACING IN POPLAR PLANTATIONS AND INTENSIVE POPLAR CULTIVATION.] [Docum.] 10th Sess. Int. Poplar Comm. No. FAO/CIP/95E Add. 2, 4 pp. [F.] After 4 years, plots in E. Macedonia spaced 2.5 × 3 m. had nearly twice the b.a. of plots spaced 5 × 6 m., and nearly 1/3 of the b.a. could be taken in a first thinning (a fact considered a definite advantage in a country where wood is scarce). Intercropping with maize in some of the widely spaced plots increased b.a. and mean diameter. [Cf. Georgopoulos, 1955, *P. deltoides* to *P. generosa*, 242.]

[Germany: Allg. Forstzeitschr.] 1961. FLURHOLZANBAU, DÜNGUNG UND HOLZVERWERTUNG. [GROWING, FERTILIZING, AND UTILIZATION OF TIMBER CROPS OUTSIDE THE FOREST.] *Allg. Forstzeitschr.* 16(31): 445-61. Many refs. [G.]

[Germany: Holzzucht] 1957. HOLZERZEUGUNG AUF EHEMALIGEN LANDWIRTSCHAFTLICH GENUTZTEN FLÄCHEN. [TIMBER CROWING ON FORMER AGRICULTURAL LAND.] *Holzzucht, Reinbek* 11(5/6): 41-3. [G.]

Giordano, E. 1962. [POPLAR-GROWING IN TURKEY.] *Cellulosa e Carta* 13(8): 5-13. [It. f. e. g.]

Of the indigenous Turkish species (*Populus nigra*, *P. alba*, *P. tremula*, *P. euphratica*, and *P. suaveolens*), only *P. nigra* is extensively grown. Its good form and rapid growth make this Turkish form worth trying elsewhere, and trials of 15 clones from Anatolia are in progress at Rome.

[Greece: Das. Chron.] 1960. HAILEUKOPHYTEIAI TES MAKEDONIAS. STATISTIKA STOICHEIA DIA TEN PARAGOGEN XYLEIAS. [THE POPLAR PLANTATIONS OF MACEDONIA. STATISTICAL DATA ON WOOD PRODUCTION.] *Das. Chron.* 2 (22/23): 1012-4. [Gk.]

Hesmer, H. 1962. [GROWING POPLARS IN INTENSIVELY MANAGED PLANTATIONS WITH AGRICULTURAL INTERCROPPING IN YUGOSLAVIA.] Forstarchiv 33 (12): 241-8. 9 refs. [G.]
A report on a study tour, describing the program, which was inaugurated in 1959, and covering organization, plans, sites, varieties, plant raising, site preparation and fertilizing, planting and tending, agricultural crops, etc., with a brief note on the growing of tree willows.

Hristoskov, N. 1958. NASIJAT OPIT PO ZALESJAVANE S TOPOLI PO PORECIETO NA DUNAV. [EXPERIMENT ON AFFORESTATION WITH POPLARS ALONG THE BANKS OF THE DANUBE.] Gorsko Stopanstvo 14(4): 26-30. [Bulg.]

Houtzagers, G. 1952. DE POPULIER IN HET LANDBOUWBEDRIJF. [POPLARS ON AGRICULTURAL LAND.] Landbouwk. Tijdschr., Wageningen 64(10):712-20. [Dut.]
Discusses the value of additional timber production to the economy of the Netherlands, makes recommendations on choice of species and culture, gives some figures of price/cu.m. for *P. gelrica*, *P. serotina*, and *P. marilandica*, discusses the merits of line plantations along fields and roadsides and the best form of shelter plantations for the Netherlands, and urges experiments and a careful examination on the effect of shelterbelts on crops.

[International: FAO Latin Amer. Poplar Conf.] 1956. EXPOSES NATIONAUX SUR LES POLITIQUES SUIVIES EN MATIERE DE POPULICULTURE. REPUBLIQUE ARGENTINE. [STATEMENTS BY INDIVIDUAL COUNTRIES ON POPLAR CULTIVATION POLICIES. ARGENTINA.] [Docum.] FAO Latin Amer. Poplar Conf., B. Aires 1956 No. FAO/CIP/LAPC/3-A, 11 pp. [F.]

Jaime Fanlo, F. 1960. TECNICAS MODERNAS EN LA PLANTACION Y CUIDADOS CULTURALES DEL CHOPO. [MODERN TECHNIQUES IN THE PLANTING AND TENDING OF POPLARS.] Montes, Madrid 16 (93): 233-53. [Span.]
A summary of information on the cultivation of poplars, including notes on selective breeding, nursery practice, the establishment of plantations, choice of varieties (with notes on some Spanish, French, and Italian clones), spacing, rotation, and tending.

Jakusenko, I. K. 1959. OB ISPOL'ZOVANII MELIORIROVANNYH BOLOT I ZABOLOČENNYH POČV POD KULTURY TOPOLEJ. [UTILIZING DRAINED BOGS AND WATERLOGGED SOILS FOR POPLAR PLANTATIONS.] Lesn. Hoz. 12(11): 72-4. [Russ.]
Presents data from Belorussia showing that *Populus* × *'canadensis'*, *P. trichocarpa*, and *P. alba* do well on such sites, and advocates that increased use be made of poplars to improve this type of land which is at present used as pasture or low-yielding hayfields.

Joachim, H. F., and Wachter, H. 1962. [THE ESTABLISHMENT AND MANAGEMENT OF POPLARS IN "PLANTAGES" [INTENSIVELY TENDED PLANTATIONS].] Arch. Forstw. 11(10): 1059-84. 11 refs. [G.g.russ.e.]

Jobling, J. 1954. SILVICULTURAL EXPERIMENTS ON POPLARS. Rep. For. Res. For. Comm., Lond. 1952/53: 49-53.

Jovkovic, B. 1962. [MODERN POPLAR GROWING IN THE POSAVINA REGION OF BOSNIA.] Topola, Beograd 6(29/30): 25-30. [Serb.f.]
Discusses proposals, based on experience in N. Italy, for planting poplar in Posavina and compares the site conditions, especially temperature, rainfall and soil quality, of the two regions. Recommendations are presented to compensate for the differing conditions.

Karpati, I., and Toth, I. 1962. [THE TYPES OF FLOOD-PLAIN FOREST COMMUNITIES IN HUNGARY.] Acta Agronomica Academiae Scientiarum Hungaricae, Budapest 11(3/4): 421-52. 54 refs. [G.g.e.russ.]
Describes the chief types of softwood and hardwood flood-plain forests, and the silvicultural treatment recommended, with special reference to poplar growing. [Cf. Toth, 1960, *Populus* sp. 232.1.]

Klebe, H. 1954. PAPPELPFLANZUNGEN IN MEINEM GRUNEWALD-REVIER. [POPLAR PLANTINGS IN THE GRUNEWALD DISTRICT.] Forst-u. Holzw. 9(23): 485-8. [G.]
Describes recent experimental plantings with a number of varieties, chiefly the "Harffer Pappel," along the Havel and on other

--mostly nonforest-sites, giving details of planting methods, spacings, use of fertilizers, and site characteristics, including soil analyses [but hardly any results].

Kohan, S. 1959. PRISPEVOK K OTAZKE PESTOVANIA TOPOL'OV NA VYCHODOSLOVENSKEJ NIZINE. [GROWING POPLARS IN THE E. SLOVAKIAN PLAIN.] Lesn. Cas. 5(2):105-42. 13 refs. [Slovak.russ.g.]

Lavezzini, A. 1958. COME DISPORRE LE PIOPELLE NEGLI IMPIANTI RAZIONALI. [THE RATIONAL LAY-OUT OF POPLAR PLANTATIONS.] Ital. Agric. 95(6):321-30. [It.]
Discusses spacing and lay-out (e.g. single rows, rectangular, quincunx, etc.) illustrated by photographs, diagrams, and tables giving distances between plants and rows for different lay-outs.

Leroy, R. 1961. LIGNES ELECTRIQUES ET FONCTIONNEMENT DES CAPITAUX DANS LES PEUPLERAIES. [ELECTRIC TRANSMISSION LINES AND THE CAPITAL INVESTED IN POPLAR PLANTATIONS.] Rev. For. Franc. 13(5): 317-31. 4 refs. [F.]

Lieken, H. 1963. [POPLAR-GROWING IN BELGIUM.] Bull. Soc. For. Belg. 70(8/9;10;11):401-39; 449-88; 519-36. 93 refs. [F.]
Covers area of plantations, varieties grown, nursery practice, plantation techniques, and research, with full literature references.

Licnard, U. G. 1950. COMMUNICATION SUR LA CULTURE DU PELLIER. [POPLAR GROWING.] Agricultura, Louvain 48(4):198-230. [F.flem.]

Lopez-Cadcnas de Llano, F. 1955. REBOISEMENT POPULICOLE EN ESPAGNE. [AFFORESTATION WITH POPLARS IN SPAIN.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 4, 8 pp. [F.]
Notes on areas planted, choice of species, planting methods, spacing, etc.

Lukjjanov, A. K. 1950. KULJTURY TOPOLEI V POIME REKI URAL. [POPLAR PLANTATIONS ON THE FLOODPLAIN OF THE a. URAL.] Lesn. Hoz. 3(3): 85-6. [Russ.]

Magyar, J. 1954. NYARASOK FATERMESE, SZERKEZETE ES KORSZERU NEVELESE. [YIELD, STRUCTURE AND MODERN TENDING OF POPLAR STANDS.] Erdesz. Kutatas., Budapest No. 2: 3-64. 12 refs. [Hu.]
From abstr. in Hung. Agric. Rev. 3(4): 8. 1954.

Marton, T. 1959. A SOMOGY MEGYEI NYARFABIZOTTSAG. [THE POPLAR COMMISSION OF COUNTY SOMOGY.] Erdo 8(4): 153-6. [Hu.russ.g.]
A description of the work, areas available for planting and the business of the first meeting and of the interests co-operating.

Mendes, J. L. 1960. LE PEUPLIER: L'ETAT ACTUEL DU PROBLEME AU PORTUGAL. [POPLAR-GROWING: THE PRESENT SITUATION IN PORTUGAL.] [Docum.] 7th Sess. FAO Jt. Subcomm. Medit. For. Probl., Lisbon 1960 No. FAO SCM 60/5-Dd, 7 pp. [F.]
Includes tabulated data on the species, clones, and cultivars identified in Portugal.

Morelli, A. 1954. L'ASSESTAMENTO DELLA CONSISTENZA PIOPICOLA. [MANAGEMENT OF POPLAR PLANTATIONS.] Agricoltura Delle Venezie, Venezia 8(8): 577-86. [It.]
Discusses the general problems of management in poplar plantations consisting of row spaced well apart above agricultural crops, and gives detailed recommendations (with specimen forms) for drawing up working plans for them.

[Morocco: Min. Agric.] 1959. VERS UNE POLITIQUE D' PEUPLIER AU MAROC. [TOWARDS A POPLAR POLICY IN MOROCCO.] Ministere de l'Agriculture, Rabat. 1959. 35 pp. [F.]
Reviews the present status of poplar-growing in Morocco, research in progress, and possibilities of expansion in the future.

Mottl, J., and Peska, R. 1961. [THE HISTORY OF POPLAR GROWING IN OPOCNO REGION.] Sborn. Csl. Akad. Zemed. Ved (Lesn.) 7(2):205-14. 5 refs. [Cz.cz.russ.e.]
Since the end of the 18th century.

[Netherlands: Staatsbosbeh.] 1961. POPULIERENTEELT. [POPLAR GROWING.] Staatsbosbeh., Utrecht. 8 pp. [Dut.]
A semi-popular booklet containing advice on choice of species, site, planting methods, intercropping with agricultural crops or alternate lines of other tree species, and tending.

- Noisette, A. 1958. LES PEUPLERAIES AUBOISES. [THE POPLAR PLANTATIONS OF AUBE.] Rev. Bois Appl. 13(2): 3-7. [F.]
- Peace, T. R. 1951. POPLAR AS A FARM CROP. Agriculture (J. Minist. Agric., Lond.) 57(10): 473-7. 1 ref. Suitable soils, methods of raising plants, pruning, recommended varieties, costs and returns. Assuming a rotation of 2.5 years, profit per tree is estimated at £4.0s. 3d.
- Piccarolo, G. 1951. LA PIOPPICOLTURA NELL'4 VALLEPADANA. [POPLAR-GROWING IN THE PO VALLEY.] Ital. Agric. 88(6): 341-52. [It.] Silvicultural methods and notes on genetics and taxonomy.
- . 1959. PIOPPICOLTURA E COLTURA ACCELERATA DELLE PIANTE DA LEGNO A RAPIDO INCREMENTO IN ITALIA. [POPLAR-GROWING AND SILVICULTURE OF OTHER FAST-GROWING WOODY SPECIES IN ITALY.] [Ente Nazionale per la Cellulosa e per la Carta, Rome.] 58 pp. [It.] A paper presented at a meeting of the Italian section of TAPPI (Bari, Sept. 1959), dealing with breeding and trials of poplars, eucalypts, and fast-growing exotic conifers.
- and others. 1958/1959. ASPETTI ED INDIRIZZI TECNICI E PRODUTTIVI DELLA PIOPPICOLTURA PIEMONTESE E DELLA COLTIVAZIONE ACCELERATA DI ALTRE PIANTE DA LEGNO. [TECHNICAL AND PRODUCTIVE ASPECTS AND TRENDS OF POPLAR-GROWING AND RAPID GROWING OF OTHER WOODY SPECIES IN PIEDMONT.] Annali Dell'Accademia di Agricoltura di Torino 101, 21 pp. [It.]
- Plavsic, S. 1960. SAVREMENE AGROTEHNIKE MERE UGAJENJU TOPOLA KAUSLOVSKIH PRINOSA. [MODERN AGRICULTURAL TECHNIQUES IN THE CULTIVATION OF POPLARS AS A CONDITION OF HIGH YIELDS.] Sumarstvo 13(11/12): 505-12. 15 refs. [Serb.] Summarizes a lecture on intensive poplar growing, covering mechanization and types of machinery, choice of site and planting stock, etc., given in June 1959 to a seminar organized by the Yugoslav National Poplar Commission.
- Podhorski, I. 1960. AKTUELNI PROBLEMI PLANTAZNOG GAJENJA TOPOLA. [CURRENT PROBLEMS OF GROWING POPLARS IN PLANTATIONS.] Topola, Beograd No. 16: 2-9. [Serb.f.] Discusses suitable soils, desirable types of planting stock, agricultural cultivation in plantations, yield at various ages on four site classes, and rotations (10-15 years is the period at present envisaged) in Yugoslavia.
- Ponticelli, P. 1955. SVILUPPO DELLA PIOPPICOLTURA FERRARESE. [THE DEVELOPMENT OF POPLAR-GROWING IN THE PROVINCE OF FERRARA.] Cellulosa e Carta 6(12): 3-10. [It.f.e.] The province consists for the most part of reclaimed (largely irrigated) land and much poplar has already been planted, The respective merits of special plantations and planting in strips along watercourses is discussed and decided in favor of the latter.
- Regnier. 1959. LA CULTURE INTENSIVE DU PEUPLIER D'APRES LES EXPERIENCES ITALIENNES. [INTENSIVE POPLAR CULTIVATION ACCORDING TO EXPERIENCE IN ITALY.] C.R. Acad. Agric. France 45(15): 762-9. [F.] A brief review following attendance at the meeting of the International Poplar Commission Conference in Italy in Sept.-Oct. 1959.
- Saby, P. 1958. LE MARAIS POITEVIN: CONTRIBUTION AUX PROBLEMES DE LA PRODUCTION ET DUCUBAGE DES PEUPLIERS. [THE MARAIS POITEVIN: ON THE PROBLEMS OF YIELD AND MEASUREMENT OF POPLARS.] Rev. Bois Appl. 13(2): 8-12. [F.]
- Samek, V. 1954. K EKOLOGII RYCHLE ROSTOUCICH DREVIN. [THE ECOLOGY OF FAST-GROWING TREES.] Lesn. Prace 33(6): 249-53. [Cz.]
- Samsiev, K. S., and Dolgih, G. D. 1962. [THE YIELD OF POPLARS IN THE N. OF KIRGHIZIA.] Lesn. Hoz. 15(8): 45-6. [Russ.]
- Soules, B. 1961. HE LEUKOKALLIERGEIA THRACES. [POPLAR CULTIVATION IN THRACE.] Das. Chron. 3(10): 390-3. [Gk.] [Switzerland: Foret] 1958. PLANTATION DE PEUPLIERS ET SOINS A LEUR DONNER. [PLANTING AND TENDING OF POPLARS.] Foret, Neuchatel 11(6): 126-31. [F.] An official memorandum of the Swiss Poplar Society, giving advice on site requirements, spacing, pruning, and protection against fungus diseases, pests, domestic animals, etc.
- Toth, I. 1961. A NYARASOK ERTEKTERMELESENEK ERDONEVELESI VONATKOZASAI. [THE RELATION OF SILVICULTURE TO VALUE PRODUCTION IN POPLAR STANDS.] Erdo 10(2): 41-5. [Hu.g.russ.]
- Trajkov, L., Stevcevski, J., and Hadzigeorgiev, K. 1959. PODIGANJE I ODGLEDUVANJE TOPOLI "O POVARDARIETO—OD TITIV VELES DO GRCKATAGRANICA. [GROWING AND TENDING POPLARS IN THE VARDAR "ALLEY [MACEDONIA]-FROM TITOV VELES TO THE GREEK BORDER.] Sum. Pregled, Skopje 7(4/5): 11-43. 19 refs. [Maced. russ.] Deals with choice of site and planting stock, raising along with agricultural crops, site preparation, thinning, rotations, etc.
- Tronco, G. 1959. PERTINENZE IDRAULICHE DEMANIALI E PIOPPICOLTURA. [STATE-OWNED ALLUVIAL LAND AND POPLAR CULTIVATION.] Cellulosa e Carta 10(5): 7-16. [It.f.e.g.] Examines the legal, technical, and social implications involved in the granting of concessions for poplar growing on newly formed alluvial lands owned by the State in the flood plain of the Po, with particular reference to the hardships caused to small landowners whose property borders on the lands in question.
- . 1962. I "NEMICI" DEL PIOppo. [THE "ENEMIES" OF POPLAR.] Ital. Agric. 1962(1): 6-21. [It.] An illustrated account of defects (e.g. knots, reaction wood, low specific gravity, short fibers) due to faults in selection of planting stock, lay-out and spacing of plantations, thinning, pruning, etc.
- Tyszkiewicz, S. 1957. TOPOLE W BASZKIRII. [POPLARS IN BASHKIRIA.] Sylwan 101(5): 67-75. [Pol.]
- Ulrich. [1956.] DER DERZEITIGE STAAND DER PAPPELWIRTSCHAFT UNTER BESONDERER BERUECKSICHTIGUNG DER ERFABRUNGEN IM FORSTAMT DANNDORF. [THE PRESENT STATE OF POPLAR GROWING, WITH SPECIAL REFERENCE TO EXPERIENCE IN THE DANNDORF FOREST DISTRICT.] Ber. Tag. Nordwestdtsh. Forstver., Braunschweig 1955: 20-37. [G.] An introduction to an excursion.
- . 1962. 15JAHRIGE ERFABRUNGEN MIT PAPPEL UND ROTHERLE IM FORSTAMT DANNDORF. [15 YEARS' EXPERIENCE WITH POPLARS AND ALNUS GLUTINOSA IN THE DANNDORF DISTRICT.] Forst-u. Holzw. 17(2): 30-3. [G.]
- Valente, E. G. 1957. PASTA PARA PAPEL OBTENIDO DE SALICINEAS DEL DELTA DEL PARANA. [PULP OBTAINED FROM SALICACEAE IN THE PARANA DELTA.] Montes, Madrid 13(78): 419-22. [Span.]
- Wachter, H. 1961. BEITRAG ZUR DURCHFORSTUNGS- UND VERBANDSFRAGE BEI DER PAPPEL IN DER ELBAUE (1. MITTEILUNG). [THINNING AND SPACING PROBLEMS IN POPLAR STANDS ON THE ELBE ALLUVIUM (1).] Arch. Forstw. 10(11/12): 1279-94. 7 refs. [G.g. russ.e.]
- Walter, M. 1959. MECHANISIERUNG DES PAPPELANBAUS UND DER PAPPELPFLEGE IM STFB NEDLITZ (KREIS ZERBST). [MECHANIZATION OF POPLAR PLANTING AND TENDING AT NEDLITZ STATE FOREST (ZERBST DISTRICT).] Forst u. Jagd. 9(3): 131-3. [G.] Describes an electric circular saw for taking cuttings from stool shoots, the use of motor cultivators, lifting plows, etc., with notes on costs and time saved compared with manual work.
- Wendt, G. 1960. ZUEINIGEN FRAGEN DES PAPPELANBAUES. [SOME PROBLEMS OF POPLAR GROWING.] Forst u. Jagd 10(10): 467-9. LG. 1 Discusses the reasons for the poor results of the poplar planting program. Of ca. 40 million poplars planted in E. Germany from 1951 to 1959, ca. 50% failed or are very poor. It is hoped that the recent transfer of most of the poplar cultivation to the state forestry unit will result in a better selection of sites and varieties, better tending, and better growth.

24 TENDING OF STANDS AND TREES

[International: IUFRO] 1962. [EFFECT OF TENDING MEASURES.] Proc. 13th Congr. Int. Union For. Res. Organ., Vienna 1961, Pt. 2(1), Sect. 23, 12 pp. [F.G.e.f.g.]

242 THINNINGS

Constantinesco, N. 1958. A PROPOS DE LA CULTURE DES PEUPLIERS. [REMARKS ON POPLAR GROWING.] Schweiz. Z. Forstw. 109(3): 187-93. 7 refs. [F.g.]

Larue. 1931. THE THINNING OF POPLARS. Bull. Soc. For. Franche-Comte 19: 37.

Magyar, J. 1959. A NYARASOK ES BUKKOSOK ERTEKESEBB FATERMESENEK ERDONEVELESI VONATKOZASAI. [THE SILVICULTURAL ASPECTS OF THE PROBLEM OF PRODUCING HIGHER TIMBER VALUE FROM POPLAR AND BEECH STANDS.] Erdeszettud. Kozl., Sopron 1959(2): 25-50. [Hu.g.russ.]

Volkman, J. 1961. UBER DIE RENTABILITAT "ON PAPPEL-FASER-HOLZAUSERST DURCHFORSTUNGEN. [PROFITABILITY OF POPLAR PULPWOOD FROM FIRST THINNINGS.] Forstarchiv 32(6): 119-22. 1 ref. [G.]

Because available data on the problem are inadequate, the author presents a model computation (using some of Ratze's data—1955, P. canadensis to P. davidiana, 524—and several simplifying assumptions) to help determine the profitability or otherwise of poplar pulpwood from first thinnings under German conditions.

245.1

Sekawin, M. 1962. LA POTATURA DEL PIOPOPO: OPERAZIONE ECONOMICA. [THE PRUNING OF POPLAR: AN ECONOMIC OPERATION.] Cellulosa e Carta 13(6): 11-24. 13 refs. [It.f.e.g.] Reviews some of the literature, illustrates good and bad practices by photographs, discusses the factors involved (e.g. species or variety of poplar, age of tree, type of planting stock, pruning season) and describes tools and equipment (e.g. a long-handled circular saw driven by compressed air, and an hydraulic elevator).

245.13

Benben, K. 1957. PODKRZESUJEMY MLODE TOPOLE. [PRUNING YOUNG POPLARS.] Las Polski, Warsz. 31(13): 4-6. [Pol.]

Meiden, H. A. van der. 1957. SNOEI VAN POPULIER, GEBASEERD OP KWALITEITSEISEN "AN DE HOUTINDUSTRIE. [PRUNING POPLARS TO FULFILL THE QUALITY REQUIREMENTS OF THE WOOD INDUSTRIES.] Ned. Boschb.-Tijdschr. 29(1): 1-7. [Du.e.]

245.17

Bol, M. 1962. SNOEIGEREEDSCHAPPEN VOOR POPULIER. [PRUNING TOOLS FOR POPLARS.] Ned. Boschb.-Tijdschr. 34(4): 145-7. [Du.] Time studies on pruning with hand tools suggested that the EIA chisel with a wooden mallet and the Folsche saw with Jiri teeth are suitable for pruning at heights of 3-5 m. and the Jiri saw with a light metal ladder for heights above 6 m. The various implements used are illustrated.

Castellani, P. 1961. LA "SCALETTA PORTATA" PER LA POTATURA DEL PIOPPA. [THE "PORTABLE LADDER" FOR USE IN PRUNING POPLARS.] Cellulosa e Carta 12(5): 31-2. [It.] Describes, with photographs, a rigid tubular-metal ladder that can be fixed e.g. to a small agricultural tractor, and so moved rapidly from tree to tree.

245.19

Holmes, G. D. 1963. TRIALS OF 2,4,5-T FOR REMOVAL OF EPICORMIC SHOOTS ON HARDWOODS. Extr. from Rep. For. Res. For. Comm., Lond. 1961 62: 156-63. 3 refs. Spraying with 2,4,5-T ester at 0.2-0.4% (acid) in water was effective in killing a large percent of epicormic shoots less than 1 year old on oak, poplar, and elm, but shoots more than 1 year old were usually not completely killed. [Cf. Wood and Holmes, 1960, below.]

Liese, W. 1957. ORIENTIERENDE UNTERSUCHUNGEN ZUR CHEMISCHEN ASTUNG VON PAPPELN. [PRELIMINARY TESTS ON "CHEMICAL PRUNING" OF POPLARS.] Forst- u. Holz. 12(17): 297-8. 3 refs. [G.]

Wood, R. F., and Holmes, G. D. 1960. SILVICULTURAL INVESTIGATIONS IN THE FOREST: (A) SOUTH AND CENTRAL ENGLAND AND WALES. CHEMICAL METHODS OF PRUNING. Extr. from Rep. For. Res. For. Comm., Lond. 1958 59: 42 Preliminary tests of spraying unwanted side branches with amyl 2,4,5-T gave promising results with poplars, but less so with epicormic branches of oak. If successful, it will result in a great saving in manpower for pruning.

25 TREATMENT OF DEFECTIVE, DERELICT OR VERY OPEN STANDS

Dcdiu, A. 1955. CONTRIBUTII LA AMELIORAREA ARBORETELOR DEGRADATE DIN LUNCA INUNDABILA A DUNARII SI DIN LUNCILE RIURILOR (ZAVOAIILE DE SALTIE SI PLOP). [THE IMPROVEMENT OF DEGRADED FOREST ON FLOODLAND AND RIVER BANKS IN THE DUNARII REGION (WILLOW AND POPLAR STANDS).] Rev. Padurilor 70(5): 209-11. [Rum.]

26 COMBINATIONS OF FORESTRY WITH AGRICULTURE

Bauer, F. [Editor]. 1956. PAPPELANBAU IN DER LANDWIRTSCHAFT. [AGRICULTURAL POPLAR GROWING.] Allg. Forstzeitschr. 11(6): 66-82. [G.]

A special number devoted to poplar growing outside the forest, including articles on opportunities and experiences on Keuper in Franconia, river valleys in Hesse, shelterbelts, etc., in the Lower Rhine region, and industrial waste lands in Bavaria. In an article on pruning (Moegling), MVC wound dressing (M. Barthel and Co., Regensburg) is recommended.

Dallimore. 1923. POPLARS FOR FARM LAND. Kew. Bull., p. 95.

263 IRRIGATED FORESTS

Traunmuller, J. 1957. DIE VERWENDUNG DER PAPPEL BEI DER AUWALD-VEREDELUNG IN OBEROESTERREICH. [POPLAR PLANTING AS A MEANS OF IMPROVING FLOODPLAIN WOODLANDS IN UPPER AUSTRIA.] Allg. Forstztg. 68(7/8): 95-7. [G.]

Briefly describes the chief site types and reports on the organizations, including supply of planting stock, finance, supervision, etc., of poplar plantings in the scattered holdings of small farmers, discussing establishment, varieties, mixtures, fertilizing, etc.

265 STRIPS OR LINES AT ROAD, RAIL AND CANAL SIDES, ETC.; HEDGEROW TREES

Bakkcr, A. 1960. VERSLAG "AN EEN ONDERZOOK NAAR DE INVLOED "AN POPULIEREN OP GRASLAND. [THE INFLUENCE OF POPLARS ON GRASS.] Meded. LandbHogesch. Wageningen 60(9): 1-38, 16 refs. [Dudu.e.e.]

Croney, D., and Lewis, W. A. 1949. THE EFFECT OF VEGETATION ON THE SETTLEMENT OF ROADS. Proc., Conf. on Biol. Civ. Eng. (5th sess.), 1948. Inst. Civ. Eng., Lond. Pp. 195-202.

Fedricco, S. 1951. LA PRODUZIONE LEGNOSA DELLE ALBERATE CAMPESTRE DELLA PIANURA PADANA. [WOOD PRODUCTION OF HEDGEROW TREES IN THE PO VALLEY.] Monti e Boschi 2(11/12): 450-5. [It.f.e.]

Blech. 1957. MOGLICHKEITEN DES PAPPELANBAUS AN WASSERSTRASSEN. [POPLAR PLANTING POSSIBILITIES ALONG WATER-COURSES.] Holz-Zbl. 83(14): 153-4. [G.]

A general article by an engineer, containing as an appendix the "Directions on Poplar Planting on Federal Water-courses (1955)" issued by the W. German Ministry of Transport. These give official guidance on questions of site, protection of banks, flood-water flow, protection from wind, etc., including drawbacks involved.

[International: IUFRO] 1962. [SHELTERBELTS AND ALLIED SUBJECTS.] Proc., 13th Congr. Int. Union For. Res. Organ., Vienna 1961 Pt. 2(1) Sect. 11, 67 pp. Many refs. [E.F.G.e.f.g.]

Joachim, H. F. 1952. PAPPELANBAU AUSSERHALB DES WALDES. [GROWING POPLAR OUTSIDE THE FOREST.] Dtsch. Landwirtsch. 3(4): 213-20. 11 refs. [G.]

Jovanovic, J. 1956. STVARANJE SUMSKOG FONDA IZVAN SUMSKIH POVRšina. [CREATING RESERVES OF TIMBER OUTSIDE THE FOREST.] Sumarstvo 9(1/2): 36-44. [Serb.e.f.]

Suggests planting Populus canadensis' along the network of canals in Croatia and Vojvodina; some small-scale plantations were made in Osijek in 1955 and experiences are described.

Lengyel, G. 1959. A NYARFATELEPITESI PROGRAMMAL KAPCSOLATOS SZOLNOK-MAGYEI TALAJVIZGALATOKRÖL. [RESULTS OF SOIL ANALYSES MADE IN THE SZOLNOK DISTRICT IN CONJUNCTION WITH A POPLAR PLANTING PROGRAM.] Erdo 8(10): 395-400. [Hu.russ.g.] Tabulated data on poplar growing trials along the banks of irrigation canals.

- Lesznyak, J. 1959. A KELETI FOCSATORNA KORNYEKENEK NYARFASITÁSI LEHETŐSÉGEI. [POSSIBILITIES OF RAISING POPLARS ALONG THE EASTERN MAIN CANAL.] *Erdo* 8(3): 98-102. [Hu.russ.g.] This 98-km. canal with its included network of waterways offers 2670 ha. for poplar planting. Special attention should be paid to soil properties, soil cultivation and at least 2-3 years' tending of the plants. A wide spacing is important. Best growth now is of *P. × robusta* but *P. × marilandica* and *P. nigra* may out-strip it later.
- Montanari, V. 1954. DIE SCHUTZWIRKUNG DES PAPPELANBAUS IM ÜBERSCHWEMMUNGSGEBIET DES PO. [THE PROTECTIVE EFFECTS OF POPLAR PLANTINGS IN THE FLOOD-PLAIN OF THE RIVER PO.] *Holzzucht, Reinbek* 8(1): 5-6. [G.] During the flood of 1952 in the Polesine area, poplars with minimum diameters of 15-20 cm. effectively protected buildings round which they grew. More than any other species, they reduced flood damage to agricultural land, irrigation canals, etc., and were most resistant to undermining. By slowing down the receding flood waters they increased sedimentation.
- Pearse, H. C. H. 1962. LIVE FENCES OF TIMBER POPLARS. *N. Z. J. Agric.* 104(2): 123, 125. Describes the planting of Lombardy poplar poles 9-10 ft. long and 2-3 in. in diameter. After 3-4 years, when trees were firmly established, wires were stapled directly on to them to make a stockproof fence. The economic advantages of fences from timber poplars are discussed.
- Podhorski, I. 1957. UZGOJ TOPOLA U DRVOREDIM A VAN SUME. [POPLAR CULTIVATION IN ROWS OUTSIDE THE FOREST.] *Topola, Beograd* No. 3: 185-204. 9 refs. [Croat.f.] Discusses growing poplars along roads, waterways, etc., and considers root spread, crown projection, and increment.
- Ponticelli, P. 1955. SVILUPPO DELLA PIOPPICOLTURA FERRARESE. [THE DEVELOPMENT OF POPLAR-GROWING IN THE PROVINCE OF FERRARA.] *Cellulosa e Carta* 6(12): 3-10. [It.f.e.] The province consists for the most part of reclaimed (largely irrigated) land and much poplar has already been planted. The respective merits of special plantations and planting in strips along watercourses is discussed and decided in favor of the latter.
- Prevosto, M. [1959?] COLTURADIRIPA DEL PIOPPOESUA INFLUENZA SULLA PRODUZIONE DI ALCUNE PIANTE ERBACEE. [THE EFFECT OF POPLAR-GROWING ALONG FIELD BORDERS ON THE YIELD OF SOME HERBACEOUS CROPS.] 1st. Sperimentazione per la Pioppicoltura, Casale Monferrato, Italy. 14 pp. 12 refs. [It.f.e.]
- Raschke, M. 1954. FLURHOLZANBAU ALS WINDSCHUTZ "UND ZUR HOLZVERSORGUNG. [TIMBER GROWING OUTSIDE THE FOREST FOR WIND PROTECTION AND WOOD PRODUCTION.] *Forst- u. Holzw.* 9(24): 503-4. [G.]
- Sanz-Pastor, D. J. M., and Picrola, F. dc. 1955. LES PEUPLIERS ET L'HYDROLOGIE FORESTIERE. [POPLARS AND FOREST HYDROLOGY.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 2, 3 pp. [F.] A note on the planting of poplars for the protection of stream banks in Spain.
- Stettler, R. 1956. PAPPELANBAU UND FLUSSKORREKTION. [POPLAR GROWING AND RIVER TRAINING.] *Schweiz. Z. Forstw.* 107(8/9): 480-90. 14 refs. [G.] A general article including recommendations for various situations and for row plantings and plantations, pure or mixed.
- Szigethy, L. 1961. RIZSFOLDEK FASITASA. [TREE PLANTING IN RICE FIELDS.] *Erdo* 10(2): 73-6. [Hu.g.russ.]
- Torroba, J. F. 1955. L'INFLUENCE DU PEUPLIER SUR LA RICHESSE BIOGÉNIQUE DES EAUX CONTINENTALES. [THE INFLUENCE OF THE POPLAR ON FRESH-WATER BIOLOGY.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 10, 3 pp. [F.] Discusses the beneficial effect on the fish population of trees (especially poplars) growing on river and stream banks.
- Toth, B. 1961. NYARFASITÁSI LEHETŐSÉGEK AZ ALFÖLDIKÖTÖTT ES SZIKES TALAJOKON. [POPLAR CULTURE OPPORTUNITIES IN FARM PLANTING ON HEAVY AND SZIK SOILS.] *Erdo* 10(4): 129.39. [Hu.g.russ.] Presents soil and growth data for poplars growing in a ditch and

on a bank, with drawings of the root systems. On these artificially created sites, poplars may be grown in areas where the soil is otherwise unsuitable. Some such plantations are described in detail.

Toulson, L. 1963. A EXPLORACAO DO CHOUPO COMO FREATOFITA NO PERIMETRO DE REGA DO APROVEITAMENTO HIDROAGRICOLA DO RIO MIRA. [INVESTIGATION INTO THE USE OF POPLAR AS A PHREATOPHYTE IN THE IRRIGATION AREA OF THE RI" MIROAGRICULTURAL AND IRRIGATION PROJECT.] *Direccao Geral dos Servicos Florestais e Aquicolas, Lisbon*. 9 pp. 21 refs. [Port.] Discusses on the basis of a study of the soils, possibilities for poplar growing in this area.

Vries, P. G. de. 1962. [A STUDY ON THE INFLUENCE OF TREE SPACING ON VOLUME AND THE SHAPE OF THE STEM CROSS SECTION OF POPLARS GROWN IN SINGLE ROWS.] *Ned. Boschb.-Tijdschr.* 34(7): 238-48. [Du.e.e.]

Wurtz, A. 1955. ACTION DES FEUILLES DE PEUPLIER DANS DE PETITS BASSINS DE PISCICULTURE. [THE EFFECT OF POPLAR LEAVES ON SMALL FISH PONDS.] *Bull. Franc. de Pisciculture, Paris* 28(179): 41-52. [F.f.]

265, 266

[Germany: Allg. Forstzeitschr.] 1958. DIE HOLZZUCHT AUSSERHALB DES WALDES IN BAYERN. [GROWING TIMBER OUTSIDE THE FOREST IN BAVARIA.] *Allg. Forstzeitschr.* 13(38): 557-8. [G.] Describes, with quotations, a book of that title published anonymously in Munich in 1856. Nine species of poplar are mentioned, with indications of site requirements.

Hilf, H. H. 1953 and 1954. HOLZZUCHT, DIE TECHNIK DES FLURHOLZANBAUS. [GROWING WOOD OUTSIDE THE FOREST.] *Holzzucht, Reinbek* No. 16: 1-5, 1953; 8(1): 6, 1954. 46 refs. [G.] A lecture chiefly discussing aims, systems (standard and coppice, special crops, etc.) with special reference to windbreaks of trees and shrubs, their composition and structure, choice of species, siting, etc., and to the uses and requirements of poplars.

Jovanovic, S. 1960. ZNAČAJ LINEARNIH ZASADA TOPOLA BRZORASTA U SKLOPU POLJEZASTITNIH POJASEVA I PLANTASA. [THE SIGNIFICANCE OF PLANTED LINES OF FAST-GROWING POPLARS IN THE COMPLEX OF SHELTERBELTS AND PLANTATIONS.] *Sumarstvo* 13(1/2): 3-14. 12 refs. [Serb.f.]

266 SHELTERBELTS, WINDBREAKS

Hilf, H. H. 1951. WINDSCHUTZ DURCH FLURHOLZANBAU. [PROTECTION AGAINST WIND BY FIELD PLANTINGS.] *Forstarchiv* 22(7/8): 106-9. 32 refs. [G.] Discusses literature on shelterbelts and recommends a greater use of tall fast-growing trees, especially poplars, underplanted with slower growing species and shrubs, in order to increase the area protected by a single shelterbelt, thus freeing more land for agricultural crops.

[Italy] 1951. L'ALBERO E LA BONIFICA. [TREES AND LAND RECLAMATION.] *Monti e Boschi* 2(11/12): 435-510. [It.] A special number with articles by several authors, dealing mainly with shelterbelt planting in Italy, and particularly with the use of poplars and eucalypts for this purpose.

Joachim, H. F. 1955. BEISPIELE ERFOLGREICHEN PAPPELANBAUES IN DER FELDFLUR UND UNTERSUCHUNGEN ÜBER DIE EINWIRKUNG "ON PAPPELANPFLANZUNGEN AUF BENACHBARE KULTUREN. [EXAMPLES OF THE SUCCESSFUL "SE OF POPLARS [TO GIVE SHELTER] IN CULTIVATED LANDS AND RESEARCH ON THE EFFECT OF PLANTING POPLARS ON NEARBY CROPS.] *Holzzucht, Lignikultur* 9(2): 9-10. [G.]

Kraaijnood, C. W. S. van. 1962. POPLARS AND WILLOWS AS SHELTER ON DAIRY FARMS. *N. Z. J. Agric.* 104(3): 215-220. Evaluates several native and exotic species of poplars and willows as shelter species, and outlines the important factors in shelterbelt design, with particular reference to dairy farms.

Mazek-Fialla, K. 1957. ERFABRUNGEN MIT DER PAPPEL BEI WINDSCHUTZ AUF FORSTUNGEN. [EXPERIENCE WITH POPLARS IN SHELTERBELTS.] *Allg. Forstztg.* 68(7/8): 99.104. [G.] Deals with the composition, establishment, sites, tending, etc., of shelterbelt plantings in the Vienna basin. Development has

led from 3 or *more* rows of poplar only, to belts of *ca. 10 m.* in width, consisting of 2 or more rows of poplar flanked by rows of *other trees and shrubs. Root crops, interplanted* on fertile sites, proved beneficial against weeds in *the early stages.*

Nageli, W. 1956. UBER DIE WINDSCHUTZWIRKUNG EINER ALLEE MIT ASTOLOSERBODENPARTIE. [ON THE WINDBREAK EFFECT OF TREE ROWS HAVING NO BRANCHES NEAR THE GROUND.] [Docum.] 12th Congr. Int. Union For. Res. Organ., Oxford 1956 No. IUFRO 56111115, 5 pp. 2 refs. [G.e.]

Panfilov, Ya. D. 1946. AGROTEKHNIKA ZASHCHITNYKH NASAZH-DENI VOROSHAEMYKH KHOZYAYSTRAKH. [TECHNIQUE OF ESTABLISH-ING PROTECTIVE PLANTATIONS ON IRRIGATED FARMS.] Nauchny Otchet ENYALMI sa 1941-1942. Sel' Khozgis, Moscow. Pp. 69-81. Bblg. [Russ.]

27 ARBORETA, ARBORICULTURE FOR ORNAMENTAL PURPOSES

Kienitz. 1919. POPLARS FOR BEAUTIFYING AND IMPROVING FOR-ESTS AND PARKS. Mitt. Dtsch. Dendrol. Ges. 28: 279.

27 1 ARBORETA

Philippis, A. de. 1958. NOTE SUR LE POPULETUM MEDITERRANEEN DU CENTRE D'EXPERIMENTATION AGRICOLE ET FORESTIERE DE L'ENTENAZIONALE PER LA CELLULOSA E PER LA CARTA, ROME. [NOTE ON THE MEDITERRANEAN POPULETUM OF THE RESEARCH STATION FOR AGRICULTURE AND FORESTRY OF THE ENTENAZIONALE PER LA CELLU-LOSAE PER LA CARTA, ROME.] [Docum.] 14th Sess. Stand. Exec. Comm. Int. Poplar Comm. Rome 1958 No. FAO/CIP/CP/17, 8 pp. [F.]

Describes the situation, *soil, climate, etc., of the Populetum* estab-

lished in March 1958 near Battipaglia (Salerno) and *the collec-tion of mountain poplars at Cucullaro (Calabria) at 900 m. alt., with lists of varieties and their origins.*

1959. NOTE SUR LE POPULETUM MEDITERRANEEN. [THE MEDITERRANEAN POPULETUM.] [Docum.] 10th Sess. Int. Poplar Comm., Italy 1959 No. FAO/CIP/98 Add. 1, 5 pp. [F.] Contains lists of Mediterranean and Near East clones cultivated, recent additions, and growth data on plants established in 1958 and 1959 in *the Rome and Battipaglia (Salerno) populeta.*

Pourtet, J., and Turpin, P. 1954. LE POPULETUM NATIONAL DE VINEUIL (LOIR-ET-CHER). [THE NATIONAL POPULETUM OF VINEUIL (LOIR-ET-CHER).] Rev. For. Franc. 6(1): 9-18. [F.] Describes the *soil, layout, etc., of the arboretum and also gives some figures for increment of various hybrids (P. serotina, P. robusta, P. regenerata) and of P. deltoides.*

Vucetic, J. S. 1958. CENTRALNI POPULETUM "KOVILOVO" U PAN-CEVACKOM RITU—KOMPLEKSNO OGLEDNO POLJE ZA ISTRAZIVANJE SA TOPOLAMA. [THE "KOVILOVO" CENTRAL POPULETUM AT PANCE-VACKORITO [SERBIA], AN EXPERIMENTAL AREA FOR COMBINED RE-SEARCH ON POPLARS.] Topola, Beograd No. 8: 635-66. 15 refs. [Serb.f.]

Describes the layout, climate and edaphic conditions of the populetum, established in 1955 north of Belgrade. The species of poplar are listed, and intended lines of research are indicated.

273 ORNAMENTAL:, STREET AND ROADSIDE TREES

Wyman, D. 1962. SORTING THE WOODY ORNAMENTALS: POPLARS GOOD FOR PAPER WOOD AND ARID AREAS, NOT AS ORNAMENTALS. Amer. Nurseryman. 116(11): 11, 89-93.

Lists I I species, varieties and *hybrids* recommended for stocking by U. S. nurserymen and *ca. 70* not recommended.

3 WORK SCIENCE. HARVESTING OF WOOD: LOGGING AND TRANSPORT. FOREST ENGINEERING

323 FELLING AND SUBSEQUENT PRIMARY CONVERSION

Muller-Thomas, H. 1950. PAPPELHOLZEINSCHLAG: FALLEN, AUF-ARBEITEN, ENTRINDEN UND VERLICHNEN. [POPLAR LOGGING: FELLING, CUTTING UP, BARKING AND WAGES.] Forstarchiv 21(7/9): 92-9. [G.]

Notes on technique and tools, *including data from time studies, where available.*

323.12/13

Curro, P. 1963. [CLEARING THE FELLING SITE IN POPLAR PLAN-TATIONS.] Monti e Boschi 14(1): 27-30. [It.f.e.]

367.4

Hippoliti, G. 1963. [NEW TOOLS FOR STUMP GRUBBING IN POPLAR STANDS.] Holzzucht, Reinbek 17(1/2): 4-5. [G.]

378.44

Leblanc, L. 1957. HARDWOOD FLOTATION STUDIES AND THEIR APPLICATIONS. Pulp Paper Mag. Can. 58(5): 242-272. 2 refs. (Woodl. Sect. Index Canad. Pulp Pap. Ass. No. 1667 (B-9-b).)

4 FOREST INJURIES AND PROTECTION

Bura, D. 1960. ZASTITNE MERE U RASADNICIMA I PLANTAZAMA TOPOLA. [PROTECTIVE MEASURES IN POPLAR NURSERIES AND PLAN-TATIONS.] Topola, Beograd 4(13/14): 11-3. [Serb.f.]

Lists destructive diseases and fauna of Yugoslavia, with means of combating them.

Farsky, O. 1961. CHOROBY A SKUDCI TOPOLU NA GABCIKOVSKU. [DISEASES AND PESTS OF POPLAR IN THE [DANUBE FLOODPLAIN FOR-ESTS OF THE] GABCIKOVO AREA.] Prace Brnenske Zakladny Ceskos-lovenske Akademie Ved, Brno 33(3): 113-75. 3 pp. of refs. [Cz.g.g.]

[Germany: Forst- u. Holzw.] 1962. SONDERHEFT PAPPEL. [SPE-CIAL NUMBER: POPLARS.] Forst- u. Holzw. 17(12): 225-44. 28 refs. [G.]

Gyorf, J. 1952. KRANKHEITEN UND SCHADLINGE DER PAPPELN IN UNGARN. [PESTS AND DISEASES OF POPLAR IN HUNGARY.] Acta Agronomica Academiae Scientiarum Hungaricae, Budapest 2(1): 41-79. 9 refs. [G.e.russ.]

[International: FAO/Near East Poplar Conf.] 1954. SECRE-TARIAT NOTE ON PESTS AND DISEASES. [Pap.] Near East Poplar

Conf., Rome 1954 No. FAO/NEPC/5, 7 pp. [E.]

Notes on *poplar pests and diseases* generally, with a brief dis-cussion of the probable situation in the Near East. *A note on the transmission of poplar disease from one country to another (R. Rol, H. van Vloten, and T. Peace) is annexed.*

[Yugoslavia: Topola] 1958. POSEBAN BROJ O ZASTITI TOPOLA. [A SPECIAL NUMBER DEVOTED TO POPLAR PROTECTION.] Topola, Beograd No. 6: 429-55. [Serb.some f.]

Kalandra, A. 1951. NEMOCI A SKUDCI TOPOLU. [DISEASES AND PESTS OF POPLARS.] Csl. Les 31(23/24): 523, 526-8. [Cz.cz.] A general account of fungus and insect diseases and pests of poplar *seedlings and adult trees.*

Kuntz, J. E., and Riker, H. J. 1949. WINTER INJURY VERSUS DISEASE IN WISCONSIN POPLAR PLANTINGS. Abstr. in Phytopath-ology 39(1): 12.

Lechevalier, H. 1944. UN NOUVEL ENNEMI POUR LES SANLOS DE QUEBEC. [A NEW ENEMY OF WILLOWS IN QUEBEC.] Nat. Canad. 7(9/10): 210. [F.]

Passavailli. 1933. VEGETABLE AND ANIMAL ENEMIES OF POPLAR. L'Alpe 20: 192.

Regnier, R. 1937. CONTRIBUTION TO THE STUDY OF POPLARS AND OF THEIR PRINCIPAL ENEMIES. ORIGIN AND CLASSIFICATION OF POPLARS. Ann. Epiph. Phytogen. 3 (4) : 507-49. Biol. Abstr. 12(3): 4392. 1938.

Schwerdtfeger, F. 1949. PAPPELVORKOMMEN UND PAPPELKRANKHEITEN IM NORDWEST-DEUTSCHEN WALDE. [POPLAR PLANTATIONS AND DISEASES AND PESTS OF POPLAR IN THE FORESTS OF NW GERMANY.] Pappelwirtschaft, Mitt. Dtsch. Pappelvereins No. 2: 29-43. [G.]

A report on answers to a questionnaire sent in 1948 to 227 forest officers (public and private) covering only poplars grown as forest plantations, and dealing with (A) the occurrence of such plantations (size and location, age, and species), and (B) diseases and pests recorded.

Sinreich, A. 1955. PAPPELSCHADLINGS UND KRANKHEITEN IN OSTERREICH IN DEN JAHREN 1951-1954. [PESTS AND DISEASES OF POPLAR IN AUSTRIA DURING THE YEARS 1951-54.] Anz. Schadlingsk. 28(1): 1-5. 2 refs. [G.]

Lists insect pests damaging roots, leaves and wood, also fungus diseases occurring on poplar during this period, with notes on the occurrence of outbreaks and their control.

[Spain: Montes, Madrid] 1955. TRATAMIENTOS DE CHOPOS. [THE CARE OF POPLARS.] Montes, Madrid 11(63): 237-9. [Span.] Brief notes on some important insect pests and fungus diseases, and their control.

Swart. 1934. ZIEHT UND PFLANZT GESUNDE PAPPELN! [RAISE AND PLANT HEALTHY POPLARS!] Dtsch. Forstw. 16(79). [G.]

41 GENERAL TECHNIQUE OF FOREST PROTECTION. TYPES OF INJURY

Regnier, R. 1937. CONTRIBUTION TO THE STUDY OF POPLARS AND THEIR CHIEF ENEMIES. Ann. Epiph. Phytogen. 3(4): 507-49. Plant Sci. Lit. 7(15): 2. 1938.

412 SILVICULTURAL CONTROL

Moriondo, F. 1954. UN PERICOLO PER IL PINO: LA VICINANZA DEL PIOPPO. [A DANGER TO PINE: THE VICINITY OF POPLAR.] Monti e Boschi 5(4): 169-72. [It.f.e.] Describes damage to young *Pinus pinea* at Orbetello by the rust *Melampsora pinitorqua* whose alternate host is poplar, with some account of measures taken to eradicate poplar.

414.4

Chardenon, J., and Taris, B. 1959. ACTION D'UN ORGANO-MERCURIQUE ET D'UN DERIVE NITRE D'UN PHENOL SUR LE DEVELOPPEMENT DE BOUTURES DE POPULUS. QUELQUES REMARQUES SUR LA REPRISE DE L'ACTIVITE CAMBIALE CHEZ LES POPULUS. [ACTION OF AN ORGANO-MERCURIC SUBSTANCE AND A NITRO DERIVATIVE OF PHENOL ON THE DEVELOPMENT OF POPLAR CUTTINGS. SOME REMARKS ON THE RESUMPTION OF CAMBIAL ACTIVITY IN POPLARS.] C. R. Acad. Agric. France 45(4): 138-40. [F.]

[France: Serv. Cult. Etud. Peuplier et Saule] 1961. ESSAIS PRATIQUES DES ORGANOMERCURIQUES EN PEPINIERE. [FIELD TESTS WITH ORGANO-MERCURY PREPARATIONS IN THE NURSERY.] Bull. Serv. Cult. Etud. Peuplier et Saule, Paris 1961(1): 1-5. [F.]

Taris, B., and Chardenon, J. 1959. QUELQUES REMARQUES SUR L'ACTION D'UN CHLORURE DE METHOXYETHYL MERCURE (3.5% DE MERCURE, 0.6% DE CHLORE) SUR L'ACTIVITE CAMBIALE ET LE DEVELOPPEMENT DES BOUTURES DE POPULUS. [SOME REMARKS ON THE ACTION OF METHOXYETHYLMERCURIC CHLORIDE (3.5% H AND 0.6% CL) ON CAMBIAL ACTIVITY AND GROWTH IN POPLAR CUTTINGS.] C. R. Acad. Agric. France 45(6): 280-1. [F.]

416 TYPES OF INJURY

Joachim, H. -F. 1957. UBER FROSTSCHADEN AN DER GATTUNG POPULUS. [FROST DAMAGE IN POPULUS.] Arch. Forstw. 6(9): 601-78. 133 refs. [G.g.russ.e.]

Peace, T. R. 1953. THE TESTING OF POPLARS FOR THEIR REACTION TO DISEASE. [Pre-issue] Proc. Congr. Int. Union For. Res. Organ., Rome 1953. Sect. 24 (No. 1/2). 8 pp. 6 refs. [F.]

Vasic, M. 1959. STETE OD VISOKE DIVLJACI UKULTURAMA TO- POLA. [GAME DAMAGE IN POPLAR PLANTATIONS.] Zast. Bilja No. 51: 31-8. 4 refs. [Serb.e.]

416.1

Agenjo, R. 1960. DOS PLAGAS DE LOS ALAMOS (POPULUS) ORIGINADAS POR "ARANUELOS" (YPONOMEUTA LATR.). [TWO SPECIES OF HYPONOMEUTA DAMAGING POPLARS.] Bol. Serv. Plagas For., Madrid 3(5): 97-114. [Span.]

Describes outbreaks of *H. gigas* in Tenerife and of *H. padella rorelli* in Aranzueque, province of Guadalajara. Some points of taxonomy, and the distribution of *Hyponomeuta* spp. in Spain are reviewed.

Bellis, E. de. 1955. DE L'HIVERNAGE D'UN ETORDEUSE DES PEUPLIERS. [HIBERNATION OF A POPLAR TORTRIX.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/79-A, 2 pp. [F.] Observations on the larva of an unidentified species of *Semasiz* or *Gypsonoma* which hibernates in the buds of poplars. [Cf. Vivani, 1953, this subject classification.]

— and Cavalcaselle, B. 1961. PROVE DI LOTTA CON ESTERI FOSFORICI CONTRO LE LARVE DEL CRITTORINCO (CRYPTORRHYNCHUS LAPATHI L.). [EXPERIMENTS IN THE CONTROL OF C. LAPATHI LARVAE BY PHOSPHORIC ESTERS.] Cellulosa e Carta 12(11): 6-13. 19 refs. [It.f.e.g.]

Boyer, M. G. 1960. OBSERVATIONS ON FOLIAGE DISEASES OF INTRODUCED POPLARS. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 16(2): 1-2.

Butin, H. 1957. DIE BLATT- UND RINDENBEWOHNENDEN PILZ DER PAPPEL UNTER BESONDERER BERÜCKSICHTIGUNG DER KRANKHEITSERREGER. [THE LEAF- AND BARK-INHABITING FUNGI OF POPLARS, WITH SPECIAL REFERENCE TO PATHOGENIC SPECIES.] Mitt. Biol. Bundesanst. Land- u. Forstw., Berlin No. 91, 64 pp. 20 refs. [G.]

Lists 94 leaf- and 51 bark-inhabiting species, their synonyms, morphology, injuries, and hosts (including differential susceptibility). A preliminary chapter presents tabulated data on the frequency and distribution over the stem, of 20 species found on 5-year-old trees of *Populus "canadensis" cv. robusta* which had been killed by *Dothichiza populea* but were still standing.

Dance, B. W. 1958. THE TAXONOMY OF FUNGI CAUSING LEAF AND TWIG BLIGHTS OF NORTH AMERICAN POPLARS. Proc. 6th Mtg. Comm. For. Tree Breeding Can., Montreal 1958, Part 2: R15-R17. Concludes that there are two fungi involved—*Venturia populina* (imperfect stage *Pollaccia elegans*) and *V. tremulae* (imperfect stage *Fusicladium tremulae*).

Doom, D., and Hille Ris Lambers, D. 1962. OVER HET MASSAAL "OORKOMEN" VAN DE SCHIMMEL LUIS PHLOEOMYZUS REDELEI H.R.L. OP POPULIEREN IN 1961 IN NEDERLAND. [A MASS OUTBREAK OF P. REDELEI ON POPLARS IN THE NETHERLANDS IN 1961.] Ned. Boschb.-Tijdschr. 34(6): 202-8. 2 refs. [Du.e.]

Drazic, M. 1961. OGLEDI HEMIJSKOG SUZBIJANJA JOVINOGRASLASE (CRYPTORRHYNCHUS LAPATHI L.). [EXPERIMENTS IN CHEMICAL CONTROL OF C. LAPATHI.] Topola, Beograd 5(20/21): 16.8. 12 refs. [Serb.]

Farsky, O. 1956. ZOBONOSKA REVOVA—RHYNCHITES (= BYCTISCUS) BETULETI FABR. SKUDCEM TOPOLU NA GABCIKOVSKU. [R. BETULETI—A PEST OF POPLARS NEAR GABCIKOVO.] Lesn. Cas. 2(4): 331-61. 51 refs. [Cz.russ.g.]

Grujovska, M. 1959. PRILOG KON POZNAVANJE TO NAMYCOS- PHAERELLA POPULIAUERW. [NOTES ON M. POPULI.] Godisn. Sum. Inst., Skopje 4: 91-5. 5 refs. [Maced.g.]

M. populi has been identified from the leaves of poplars, particularly *Populus nigra* var. *pyramidalis*, in nurseries and plantations along the river Vardar.

[Italy: Ente Naz. Cellulosa] 1953. ATTI DEL CONGRESSO NAZIONALE DEL PIOPPO (ROVIGO 15 NOVEMBRE 1953). [PROCEEDINGS OF THE [ITALIAN] NATIONAL POPLAR CONFERENCE (ROVIGO 15 NOVEMBER 1953).] Pubbl. Ente Naz. Cellulosa Carta, Roma 1954. 257 pp. [It.]

The papers and discussions deal mainly with the economic aspects of poplar growing in Italy. An exception is a paper by D. Rui, G. Giraldo and F. Bellavite on poplar pests in Veneto, dealing

with outbreaks of (1) *Phloeomyzus passerinii* and (2) *Dothichiza populea*.

Knezevic, I. 1959. SEMASIA—STETNIK MLADIH TOPOLA. [SEMASIA, A PEST OF YOUNG POPLARS.] Topola, Beograd No. 9: 776-8. 1 ref. [Serb.]

Describes damage to seedlings by *Semasia* spp. in a nursery near Osijek, Croatia, by larvae feeding on and killing the terminal bud, provoking a broomlike growth of several shoots from a lower bud. Spraying fortnightly in spring with lindane [gamma BHC] and DDT did not give effective control, and silvicultural measures are recommended for the attacked plants.

Marks, G. C. 1963. SHOOT BLIGHT OF POPLARS CAUSED BY COLLETOTRICHUM GLOEOSPORIOIDES. Abstr. of thesis, in Dissert. Abstr. 24(4): 1332. [Univ. Wis.]

Miklos, I. 1958. POJAVA CVRCKA CERESA BUBALUS FABR. NA TOPOLAMA UNR HRVATSKOJ. [C. BUBALUS ON POPLAR IN CROATIA.] Topola, Beograd No. 6: 455-61. 6 refs. [Croat.g.]

Moriondo, F. 1961. RIPETIZIONE SPERIMENTALE DEL CICLO BIOLOGICO DI MELAMPSORA PINITORQUA ROST. [EXPERIMENTAL REPETITION OF THE LIFE CYCLE ON M. PINITORQUA.] Ital. For. Mont. 16(2): 73-7. [It.it.f.]

The author has demonstrated experimentally that this rust fungus can overwinter in the mycelial state in the tissues of poplar shoots in the climatic conditions of Florence. [Cf. Moriondo, 1954. *P. canadensis* to *P. davidiana*, 443.3, and Regler, 1957, *Populus* sp., 416.15.]

Pietri-Tonelli, P. de, Galli, A., and Chicsa, G. 1959. CONTROL OF CRYPTORRHYNCHUS LAPATHI ON POPLARS WITH CARPOSAN 50. [Contributi, Istituto di Ricerche Agrarie, Societa Montecatini, Milano 1957-58 Vol. 2: 9-21. 2 refs. [It.]

Describes experiments with brushing or spraying of a parathion preparation in Toscana and Lombardy, showing that treatments with concentrations not less than 0.1% active principle gave excellent control. Best time would be February-March in central, and March-April in northern Italy. [Cf. Bellis and Cavalcaselle, 1961, this subject classification.]

Regler, W. 1953. AUFTRETEN EINES NEUEN PAPPELSCHADLINGS IN DER DDR. [APPEARANCE OF A NEW POPLAR DISEASE IN THE DDR [EASTERN ZONE OF GERMANY].] Wald 3(10): 312-3. 6 refs. [G.]

Reports the occurrence of *Septogloeum populiperdum* in poplar nurseries in E. Germany, *Populus robusta*, *P. berolinensis*, *P. "canadensis"* Leipzig, *P. trichocarpa*, and *P. bachelierii* being mentioned, describes the symptoms and suggests precautions against its spreading.

Savescu, A. 1955. O SPECIE NOUA DE PADUCHI TESTOSI, PADUCHELE VIRGULA A L. PLOPULUI (LEPIDOSAPHES POPULI SAVESCU N. SP.) (COCCOIDEA-DIASPIDIDAE). [A NEW SCALE INSECT, THE POPLAR TWIG SCALE (L. POPULI SP. NOV.)] Bull. Sti. Acad. Repub. Rom. (Sect. Biol.) 7(4): 915-25. 6 refs. [Rum.russ.f.]

Describes a new scale insect, first recorded in 1944 near Ploesti, and since then in six other localities in Rumania. It attacks poplars, robinia, willow, and ash and is particularly dangerous to the first two. It is parthenogenetic, and differs from *L. ulmi* in having only one generation annually.

Schefer-Immel, V. 1959. DIE ZIKADE IDIOCERUS DECIMAQUARTUS SCHRK. ALS PAPPELSCHADLING. [I. DECIMAQUARTUS AS A PEST OF POPLAR.] Anz. Schadlingsk. 32(10): 150-5. 14 refs. [G.]

Presents data on biology and life history, based on observations made during a severe outbreak in 1958-59 in Frankfurt.

Sinreich, A. 1952. DER KAFERFRASS DES GROSSEN PAPPELBOCKES, SAPERDA CARCHARIAS L. [THE FEEDING PATTERN OF ADULTS OF S. CARCHARIAS L.] Mitt. Forstl. VersAnst., Mariabrunn 48: 168-70. [G.]

Gives photographs and a drawing of the holes eaten in poplar leaves. Holes due to feeding by beetles of this species may be recognized by their serrated margins.

Smereka, E., and LeJeune, R. R. 1953. LEAFHOPPERS ATTACKING POPLAR. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 9(6): 2.

The following leafhoppers have been collected from poplars in the prairie provinces where they cause considerable damage:

Idiocerus lachrymalis, *I. suturalis*, *Oncometopia lateralis*, *Macropsis* sp., *Oncopsis* sp., and *Agallia* sp.

Templin, E. 1957. TIERISCHE BLATTSCHADLINGE AN PAPPELN. [LEAF PESTS ON POPLARS.] Forst u. Jagd Spec. No. Die Pappel 2: 17-36. 24 refs. [G.]

An illustrated account of leaf-mining, leaf-sucking, gall-producing, and leaf-eating insects and mites, systematics, bionomics, economic importance, distribution, host preference, etc., including list of suitable preparations for dusting or spraying.

Vivani, W. 1953. UNA ANORMALE E DANNOSA RAMIFICAZIONE APICALE NELLE GIOVANI PIOPELLE. [AN ABNORMAL AND HARMFUL APICAL RAMIFICATION OF YOUNG POPLAR SEEDLINGS.] In Studie e Ricerche Sulla Pioppicoltura, Ente Nazionale per la Cellulosa et par la Carta, Roma. Pp. 9-19. [It.]

The condition is due to the larvae of several species of *Semasia* which oviposit in the terminal buds. The parasitization of the larvae by a species of *Bracon* is described. Control can also be effected by early removal of infested shoots, which should be cut back to a healthy bud.

1955. NOTE BIOLOGICHE SULL'AFIDE LANIGERO DEL PIOPO (PHLOEMYZUS PASSERINII SIGNORET). [BIOLOGICAL NOTES ON THE POPLAR WOOLY APHID, P. PASSERINII.] Cellulosa e Carta 6(1): 7-12. [It.f.e.]

Describes the development and life history of the insect and explains the methods used to test the resistance of different poplar clones. Results of tests show that "Canadian poplar," *P. euroamericana* f. 128 and f. 165 are very susceptible, whereas *I* 214 and *I* 455, "Caroline poplar" and *P. alba* Linn. are almost immune.

Young, C. W. T. 1963. TESTING OF POPLARS AND PINES AGAINST PINE TWISTING RUST, MELAMPSORA PINITORQUA. Extr. from Rep. For. Res. For. Comm., Lond. 1961.62: 137-40. 3 refs.

416 11

Anchierri and Grivaz. 1952. POUDRAGE INSECTICIDE DANS LA PEUPLERAIE DOMANIALE DE CHAUTAGNE. [INSECTICIDAL DUSTING IN THE STATE POPLAR PLANTATIONS OF CHAUTAGNE.] Rev. For. Franc. 1952(10): 752-8. [F.]

Anders, O. 1958. VORLAUFIGE UNTERSUCHUNGSERGEBNISSE UBER DIE LEBENSWEISE DES PAPPELKNOSPENWICKLERS SEMASIA OPPRESSANA TR. UND DES PAPPELTRIEBWICKLERS SEMASIA ACERIANA DUP. [PRELIMINARY INVESTIGATIONS INTO THE LIFE HISTORY OF S. OPPRESSANA AND S. ACERIANA.] Anz. Schadlingsk. 31(7): 101-7. 14 refs. [G.]

Bellis, E. de. 1958(1959). CONTRIBUTO ALLA CONOSCENZA DELLA BIOLOGIA DELLA GYPSONOMA ACERIANA DUP. [CONTRIBUTION TO THE KNOWLEDGE OF THE BIOLOGY OF G. ACERIANA.] Pubbl. Cent. Sper. Agric. For., Roma 2: 3-22. 14 refs. [It.ite.e.]

1960. PROVE DI LOTTA CHIMICA CONTRO LA PHYLLONISTIA SUFFUSELLA Z. [TESTS OF CHEMICAL CONTROL OF P. SUFFUSELLA.] Pubbl. Cent. Sper. Agric. For., Roma 4: 225-30. [It.ite.e.]

Burmahn, K. 1956. KLEINFALTERRAUPEN AN PAPPELN IN NORDTIROL. [LEPIDOPTEROUS LARVAE ON POPLARS IN THE NORTHERN TIROL.] Anz. Schadlingsk. 29(9): 145-6. [G.]

Lists 45 lepidopterous species, where found, and on what poplar species.

Ciferri, R. 1951. NOMENCLATURA DEL FUNGO CHE CAUSA LA 'DEFOGLIAZIONE PRIMAVERILE' DEI PIOPI. [NOMENCLATURE OF THE FUNGUS CAUSING SPRING DEFOLIATION OF POPLARS.] Notiz. Malatt. Pianta No. 14: 88, 103. 4 refs. [It.e.]

The pathogen is renamed *Endostigma populina* (Vuill.) n. comb. (= *Didymosphaeria populina* Vuill. = *Venturia populina* Fabr.). Synonyms of the conidial stage *Pollacciaelegans*, are probably *Stigma populina* and *Septogloeum rhopaloides*.

Dafauce, C. 1959. NOTAS SOBRE STILPNOTIA SALICIS L. EN ESPANA. [NOTES ON S. SALICIS IN SPAIN.] Bol. Serv. Plagas For. Madrid 2(3): 41-6. [Span.]

Francke-Grosman, H. 1961. UBER EINE BEMERKENSWERTE PAPPELBLATTWESPE, STAUONEMA COMPRESSICORNIS (FABR.) BENSON.

[S. [PRISTIPHORA] COMPRESSICORNIS, A REMARKABLE SAWFLY FEEDING ON POPLAR LEAVES.] Z. PflKrankh. 58(1; 2): 20-5. 2 refs. [G.]

Frediani, D. 1955(1956). NOTIZIA SULLA STILPNOTIA SALICIS L. ED ALCUNI SUOI PARASSITI ED IPERPARASSITI NELLA TOSCANA LITORANEA. [S. SALICIS AND SOME OF ITS PARASITES AND HYPERPARASITES IN THE TUSCAN COASTAL REGION.] Annali Della Facolta di Agraria, Pisa (n.s.) 16(1): 47-53. 13 refs. [It.]

Gives life history, and damage caused by the pest on poplars in Tuscany, and some account of its parasites (carcelia gnava, Apanteles solitarius, Telenomus mayri), and a hyperparasite (Dibrachys affinis).

Gremmen, J. 1956. EEN BLAD- EN TWIJGZIEKTE VAN POPULIEREN VERORZAAKT DOOR VENTURIA TREMULAE EN VENTURIA POPULINAE. [LEAF AND TWIG DISEASE OF POPLARS CAUSED BY V. TREMULAE AND V. POPULINAE.] Tijdschr. PlZiekt. 62(5): 236-42. 9 refs. [Dut.] (Korte Meded. Bosbouwproefsta. T.N.O., Wageningen No. 27.)

Grio, M. 1951. LA LUCHA BIOLOGICA CONTRA EL BICHODE CESTO Y LA POSIBILIDAD DE SUEMPLCO. [BIOLOGICAL CONTROL OF OIKETICUS KIRBYI AND ITS POSSIBILITIES.] Cien. & Invest., B. Aires 7(5): 195-202. 7 refs. [Span.]

Jahn, E., Wettstein, O., and Sinreich, A. 1960. SCHADLINGSBEFALLS FOLGEN IN EINEM WINDSCHUTZGEHOLZSTREIFEN BEI TADTEN IM BURGENLAND. [PESTS ATTACKING SUCCESSIVELY A SHELTERBELT IN TADTEN, BURGENLAND [Austria].] Allg. Forstztg. 71(15/16): Suppl. (Informationsdienst No 35). 2 pp. 4 refs. [G.]

Jancke, G. D. 1959. THE WILLOW MOTH A PEST OF FRUIT ORCHARDSTOCK. Fmg. S. Afr. 35(7): 19, 21.

Kopsacheilis, G. 1959. KATAPOLEMESIS TON ENTOMON LEUKES. [CONTROL OF POPLAR INSECT PESTS.] Das. Chron. 1(12): 541. [Gk.] Brief report on successful control of Gypsonoma aceriana attacking nursery seedlings of poplar, especially Populus nigra var. italica, by spraying with a fresh mixture of BHC, aldrin, and Planter [unspecified] in water.

Kuteev, F. S. 1960. OL'HOVYJ SKRYTNOHOBOTNIK—OPASNYJ VREDITEL' TOPOLJA [CRYPTORRHYNCHUS LAPATHI—A DANGEROUS PEST OF POPLAR.] Sborn. Rabot Lesn. H o z . Vsesojuz. Nauc.-Issled. Inst. Lesovod. No. 43: 5-18. 6 refs. [Russ.]

Li, Y. -C. 1959. [PRELIMINARY RESULTS OF TESTS ON THE USE OF INSECTICIDES TO CONTROL THREE SPECIES OF INSECTS DAMAGING THE LEAVES OF POPLARS.] For. Sci., Peking No. 4: 321-6. 4 refs. [Chin. russ.]

Martelli, G. 1957. LA GEMMATOLA DEL PIOPO. [THE POPLAR BUDWORM.] Giornale d'Italia Agricola, Roma No. 26. [It.] From abstr. in Ital. Agric. 7(94): ii-iii. Poplar nurseries in Italy are often infested by a Gypsonoma sp. causing malformations of buds and lenders. It has been wrongly identified with G. neglectana, but differs in having two generations in the year instead of one. Control by picking off infested buds or spraying with a mixture of DDT and parathion is recommended.

Martelli, M. 1954. LA PRISTIPHORA CONJUGATA DAHLB. (HYMENOPTERA TENTHREDINIDAE) IN TOSCANA. [P. CONJUGATA IN TUSCANY.] Redia, Firenze (Ser. 2) 39: 157-85. 24 refs. [It. ite.] Gives an account of the Pristiphora spp. occurring in Italy, their distribution, hosts, etc., and a detailed description of P. conjugata, life history, parasites, and suggested control measures, in poplar plantations.

Miklos, I. 1960. PYGAERA ANASTOMOSIS L.—NOVI STETNIK NA TOPOLAMA. [P. ANASTOMOSIS, A NEW PEST OF POPLARS.] Sum. List 84(11, 12): 368-70. 8 refs. [Croat.]

Gives description, and notes on biology and life history. Though defoliation by the pest has been noted for some 7 years, its most serious attack yet in Croatia occurred in 1959 on the 163-ha. 'Vijus' plantation near Brod. It multiplies very rapidly, producing three to four generations a year. In laboratory tests, it preferred 'Canadian' poplars to native species. As the former are now used on a large scale in plantations, damage from P. anastomosis can be expected to increase. [Cf. Jahn, Wettstein, and Sinreich, 1960, this subject classification.]

Miller, W. E. 1955. BIOLOGY OF ANACAMPSIS INNOUELLA (ZELLER), A LEAF-ROLLER ON ASPEN. J. Econ. Ent. 48(5): 622-3. 5 refs.

Gives details of this leaf-eater's life history as observed on Populus grandidentata, other hosts already reported being P. wislizeni, P. tremuloides, and P. alba. A list of certain, probable and possible parasites is included.

Morris, R. C. 1956. LEAF BEETLE DAMAGES COTTONWOOD TREES IN DELTA. Inform. Sheet, Miss. Agric. Exp. Sta. No. 537, 2 pp. An infestation of Chrysomelasma scripta in nurseries and a plantation is described. The beetles were readily controlled in the nursery by spraying with endrin or dieldrin.

Patocka, J. 1953. MURKY RODU SARROTHRIPUS—SKUDCI TOPOLU. [MOTHS OF THE GENUS SARROTHRIPUS—POPLAR PESTS.] Zool. Ent. Listy 2(2): 76-88. 9 refs. [Cz. russ. g.]

Illustrated description of two new species found in two places in Czechoslovakia, viz. Sarrothripus populana and S. cuneana.

1954. HOUSENKY SKODICI NA LISTECH TOPOLU. [LARVAE THAT DAMAGE POPLAR LEAVES [IN CZECHOSLOVAKIA].] Prace Vyzkum. Ust. Lesn. CSR No. 5: 163-282. 36 refs. [Cz. russ. g.]

Scheffer-Immel, V. 1957. AUFTRETEN EINIGER BISHER NOCH NICHT ODER NUR SELTEN AN PAPPEL UND DOUGLASIE BEOBACHTETER LEPIDOPTEREN. [LEPIDOPTERA NEWLY OR RARELY OBSERVED ON POPLAR AND DOUGLAS FIR.] Anz. Schadlingsk. 30(4): 57. [G.]

Acronycta leporina, Macrothylacia rubi and Biston stratararius on poplar and Tortrix viridana on Douglas fir.

1959. EINIGE BEMERKUNGEN ZUR BIOLOGIE DES PAPPEL-TRIEBWEICKLERS, SEMASIA ACERIANA DUP. [THE BIOLOGY OF S. ACERIANA.] Anz. Schadlingsk. 32(11): 166-9. 16 refs. [G.]

Observations in the Rhein-Main district during 195X-59 showed no influence of soils or age class upon susceptibility of poplars to attack by Semasia aceriana, but black and Lombardy poplars suffered more severely than Populus x canadensis. Observations are presented on biology and life history of the pest.

Schimitschek, E. 1955. ZUR KENNNTNIS DES PAPPELSCHADLINGS PYGAERA ANASTOMOSIS L. (LEP.-FAM. NOTODONTIDAE). [P. ANASTOMOSIS, A PEST OF POPLAR.] Anz. Schadlingsk. 28(10): 153-6. 6 refs. [G.]

Notes on morphology, life history, and nature of damage.

Schnaiderowa, J. 1954. O ZWALCZANIU STONEK WYSTĘPUJACYCH NA TOPOLACH. [CONTROL OF CHRYSOMELIDAE FOUND ON POPLARS.] Sylwan 98(4): 316-21. 12 refs. [Pol. pol.]

Templin, E. 1956. AUFTRETEN, BIONOMIE UND BEKÄMPFUNG DES GROSSEN GABELSCHWANZES (DICRANURA VINULA L.) [OCCURRENCE, BIONOMICS AND CONTROL OF D. VINULA.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 16 (Beitr. Pappelforsch. No. 1): 102-30. 72 refs. [G. g.]

1957. DIE ROTEN PAPPELBLATTKAFER (MELASOMA POPULI L. "ND MELASOMA TREMULAE F.) [CHRYSOMELA POPULI AND C. TREMULAE.] Merkbl. Inst. Forstwiss. Tharandt (Abt. Forstschutz Tier. Schadl.) No. 13, 8 pp. [G.]

An illustrated description of the insects, their bionomics, habits, enemies, injuries, and control. Infestation, which may cause serious damage to young plants, is favored by hot, dry weather in late summer and spring. Chief enemies include pheasants and partridges, and the parasite Schizonotus sieboldi. Dusting or spraying with DDT in spring, or, if later treatments are necessary, combined DDT and BHC, are recommended.

Vasic, K. 1958. MALA TOPOLINA SOVICA (NYCTEOLA ASIATICA KRUL.) IZBILJNA STETOCINA TOPOLINI KULTURA. [N. ASIATICA, A SERIOUS PEST OF POPLAR PLANTATIONS.] Topola, Beograd No. 6: 447-54. 6 refs. [Serb. f.]

[Yudelevich, M.] 1954. LA CUNCUNA DE LOS PINOS. [DIRPHYA ANPHIMONE.] Chile Maderero 4(7): 1, 3-4. [Spa. n.]

416.12

Blankwaardt, H. F. H. 1955. DE POPULIERENSCHOUTBOORDER (EPINOTIA (GYPSONOMA) ACERIANA DUP.). [G. ACERIANA.] Ned. Boschb.-Tijdschr. 27(10): 266-73. 2 refs. [Dut. e.] (Meded. Inst. Toegep. Biol. Onderz. Nat. No. 22. 1955.)

Kozlovsky, S. 1955. CONTRIBUTION A L'ETUDE MORPHOLOGIQUE ET BIOLOGIQUE DE PHYLLOCNISTIS SUFFUSELLA ZELL. ET LITHOCOLLETIS POPULIFOLIELLA TR. [MORPHOLOGICAL AND BIOLOGICAL STUDY OF P.

- SUFFUSELLA AND L. POPULIFOLIELLA.] Ann. Ec. Eaux For. Nancy 14(2):261-76. 26 refs. [F.]
A study of two poplar leaf-miners.
- L., A. 1963. [CONTROL OF CRYPTORRHYNCHUS LAPATHI.] Monti e Boschi 14(2): 89-91. [It.]
Instructions for spraying with parathion in young poplar plantations.
- Lindquist, O. H. 1963. THE COTTONWOOD LEAF MINER, LEUCOPTERA ALBELLA CHAM. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. 19(1): 2.
L. albella is recorded for the first time in Ontario, on *Populus balsamifera*, *P. canadensis*, *P. deltoides*, *P. grandidentata*, *P. nigra*, and *P. tremuloides*.
- Martin, J. L. 1956. THE BIONOMICS OF THE ASPEN BLOTCH MINER, LITHOCOLLETIS SALICIFOLIOLLA CHAM (LEPIDOPTERA: GRACILLARIDAE). Canad. Ent. 88(4): 155-68. 10 refs. (Contr., Div. For. Biol. Dep. Agric. Can. No. 272.)
- Savelj, M. 1961. TOPOLOV MOLJ (PHYLLOCNISTIS SUFFUSELLA ZELL.). [P. SUFFUSELLA.] Gozd. Vestn. 19(1/2): 21-3. 3 refs. [Sloven.]
Observations on attacks by this leaf-miner of poplar in Slovenia, its life history, the damage it causes, and control. [Cf. Schefer-Immel, below.]
- Schefer-Immel, V. 1960. PHYLLOCNISTIS SUFFUSELLA Z. UND PHYTOMYZA (PHYTAGROMYZA) POPULI KLTB.. ZWEI BLATTMINIERENDE PAPPELSCHADLINGSK. [P. SUFFUSELLA AND P. POPULI. TWO LEAF-MINERS OF POP LAR.] Anz. Schadlingsk. 33(2): 22-4. 5 refs. [G.]
Presents observations on these leaf-miners, which were found causing considerable damage to poplars (chiefly *Populus* × '*canadensis*') in the Rhein-Main area in the summers of 1958 and 1959.
[U.S.A.: South. For. Exp. Sta.] 1959. SYSTEMICS MAY HELP CONTROL COTTONWOOD BORER [GYPSONOMA HAIMBACHIANA]. Extr. from Rep. U. S. For. Serv. Sth. For. Exp. Sta. 1958: 48
In a preliminary study, plants developed from cuttings that had been dipped in a carbon dust containing 44% thimet had an average of 1.1 borers per shoot and 0.8 per leader at the end of the first growing season, vs. 39.9 and 17.9 respectively in controls [cf. U.S.A.: Sth. For. Exp. Sta., 1958, *P. deltoides* to *P. generosa*, 453].
- 416.15**
- Aerts, R. 1963. [TRIALS IN THE CONTROL OF MELAMPSORA RUST OF POPLAR.] Agricultura, Louvain (Ser. 2) 11(2): 121-34. 6 refs. [F.f.d.u.e.g.]
- Boyer, M. G. 1961. VARIABILITY AND HYPHAL ANASTOMOSES IN HOST-SPECIFIC FORMS OF MARSSONINA POPULI (LIB.) MAGN. Canad. J. Bot. 39(6):1409-27. 20 refs. (Contr. For. Ent. Path. Br. Dep. For. Can. No. 763.)
- Brandes, J. 1963. [ELECTRON MICROSCOPE STUDY OF A POPLAR VIRUS.] Phytopath. Z. 47(1): 84-9. 13 refs. [G.g.c.]
No reliable morphological differences could be found between a German and a Dutch isolate from infected leaves of *Populus robusta* and *P. × canadensis* 'Gelrica'.
- Cash, E. K., and Waterman, A. M. 1957. A NEW SPECIES OF PLAGIOSTOMA ASSOCIATED WITH A LEAF DISEASE OF HYBRID ASPENS. Mycologia 49(5):756-60. 6 refs.
Discoloration of leaves in the progenies of intra- and interspecific crosses with *Populus tremuloides* was traced to a new species, *Plagiostoma populi* sp. nov., which is described.
- Chiba, O., and Nobuno, Y. 1961. VARIETAL DIFFERENCES IN SUSCEPTIBILITY TO LEAF RUST- MELAMPSORA LARICI-POPULINA. Abstr. in Ann. Phytopath. Soc. Japan, Tokyo 26(2): 64. [Jap.]
From abstr. in Rev. Appl. Mycol. 41(3):179-80. 1962.
- and Zinno, Y. 1960. UREDOSPORES OF THE POPLAR LEAF RUST, MELAMPSORA LARICI-POPULINAKLEB., AS A SOURCE OF PRIMARY INFECTION J Jap. For. Soc. 42(11): 406-9. 6 refs. [E.e.jap.]
- Donaubauer, E. 1963. [METHODS OF TESTING RUST SUSCEPTIBILITY IN POPLAR.] Cbl. Ges. Forstw. 80(3): 174-84. 10 refs. [G.]
Discusses various methods of rating described in the literature,

and more particularly the method now employed in Austria—a further slight modification of Schreiner's method (as modified by van der Meiden [1961, this subject classification]).

- Ende, G. van den. 1952. EEN BLADVLEKKENZIEKTE VOORKOMEND OP DE POPULIERENVEROORZAAKT DOOR SEPTOTINIA POPULIPERDA WATERMAN AND CASH. [LEAF BLOTCH OF POPLARS CAUSED BY S. POPULIPERDA.] Tijdschr. PlZiekt. 58(2): 54-9. 3 refs. [Du.e.]
The leaf blotch was found in a nursery at Hoog Keppel in 1950; damage was slight. The fungus is described, and poplar species on which it has been found in the Netherlands are listed. [Cf. Waterman and Cash. 1950 *Populus* sp., 443.]
- 1954. HET PARASITAIRE KARAKTER "AN SEPTOTINIA POPULIPERDA. [THE PARASITIC CHARACTER OF S. POPULIPERDA.] Tijdschr. PlZiekt. 60(6): 253-5. 4 refs. [Du.e.]
Cuttings of *P. candicans*, *P. marilandica*, and *P. brabantica* were sprayed with suspensions of the ascospores. Leaf blotches formed only when leaf injuries were already present. *P. candicans* proved the most susceptible species. Spraying the upper or lower leaf surface was equally effective. Germination of the ascospores was prevented by concentrations of Cu (Bordeaux mixture or CuSO_4) of 7-8 mg. Cu/litre.
- Gremmen, J. 1954. OP POPULUS EN SALIX VOORKOMENDE MELAMPSORA-SOORTEN IN NEDERLAND. [MELAMPSORA SPP. FOUND ON POPULUS AND SALIX IN THE NETHERLANDS.] Tijdschr. PlZiekt. 60(6): 243-50. 5 refs. [Du.e.]
- 1962. [MARSSONINA DISEASE OF POPLARS.] Ned. Boschb.-Tijdschr. 34(12): 428-32. 4 refs. [Du.e.e.]
Describes the perfect stage, identical with *Drepanopeziza populorum*, developed in culture from leaves infected with *Marssonina* sp. (probably *M. populi*). The ascospores are probably responsible for primary infection of nursery plants and older trees in spring. Further spread is by conidia.
- Kang, K. -W. 1959. [STUDIES ON THE LEAF BLOTCH OF POPLAR CAUSED BY SEPTOTINIA POPULIPERDA.] Res. Rep. Inst. For. Genet., Suwon No. 1: 51-60. 25 refs. [Kor.kor.e.e.]
Discusses growth of the fungus in culture. Inoculations showed that of four species studied, *Populus maximowiczii* was most and *P. monilifera* least susceptible. Injured leaves were more susceptible than sound ones. No difference was found in size and number of stomata between the poplars tested, but epidermal tissue of *P. nigra* var. *italica* and *P. monilifera* (considered resistant) was thicker than in *P. maximowiczii* and *P. koreana*.
- Magnani, G. 1961(1962). RUGGINE MEDITERRANEA DEL PIOPO BIANCO DA MELAMPSORA PULCHERRIMA (BUB.) MAIRE. [M. PULCHERRIMA RUST OF POPULUS ALBA.] Pubbl. Cent. Sper. Agric. For., Roma 5: 221-36. 4 refs. [It.it.e.e.]
A description of *M. pulcherrima*, which causes a leaf rust in *P. alba*, its intermediate host being *Mercurialis annua*. Experimental inoculations on a number of other poplar species and hybrid clones showed low susceptibility in all; some infections were obtained on "I 154," "I 214," "I 455," *P. nigra*, *P. × berolinensis*, and *P. yunnanensis*.
- 1963. [SEPTORIOSIS OF POPULUS NIGRA CAUSED BY SEPTORIA POPULI.] Pubbl. Cent. Sper. Agric. For., Roma 6: 5-26. 22 refs. [It.it.e.e.]
A fungus isolated from necrotic spots on leaves of *P. nigra* var. *pyramidalis* and *P. × berolinensis* in the nursery, and *P. nigra* in the field, was identified as *S. populi* Desm. Leaf inoculations on several poplar species and clones produced symptoms.
- Meiden, H. A. van der. 1961. METHODENTER BEOORDELING VAN DE AANTASTING "AN POPULIER DOOR ROEST. [METHOD FOR RATING RUST INFECTION ON POPLARS.] Ned. Boschb.-Tijdschr. 33(3): 77-80. 3 refs. [Du.e.]
Schreiner's rating for *Melampsora* infection [1959, this subject classification] is modified by the addition of a further class of infection, heavy necrosis and leaf-fall, with numerical values 125-375.
- 1962. [MARSSONINA, A DANGEROUS POPLAR LEAF DISEASE.] Ned. Boschb.-Tijdschr. 34(7): 249-54. 5 refs. [Du.e.]
Describes the symptoms of the disease caused by one or more species of *Marssonina*, and discusses its extent in the Netherlands, and the effect of weather, the physiological condition of the tree

and the susceptibility of the clone. 'Serotina erecta' being the most and 'Robusta' the least susceptible of cultivars used in the Netherlands. Spraying with Cu solutions gives control in the nursery.

— and Kolster, H. W. 1961. DE GEVOELIGHEID VAN EEN AANTAL POPULIEREKLONEN VOOR ROEST (MELAMPSORA LARICI-POPULINA). [THE SUSCEPTIBILITY OF A NUMBER OF POPLAR CLONES TO INFECTION BY M. LARICI-POPULINA.] Ned. Boschb.-Tijdschr. 33(3): 81-4. 2 refs. [Du.e.]

— and Kolster, H. W. 1963. [THE SUSCEPTIBILITY OF A NUMBER OF POPLAR CLONES TO INFECTION BY MELAMPSORA LARICI-POPULINA.] Ned. Boschb.-Tijdschr. 35(10): 413-5. 2 refs. [Du.e.] Of 100 clones assessed. Eckhof, 1 154, 1 455, 1 63/51, 1 74/51, 1 77/51 and Virginia de Frignicourt were the most resistant. Six others were sufficiently resistant and 12 clones proved very susceptible to leaf-cast caused by Marssonina.

Nohara Y., Kodama, T., and Aoyama, Y. 1961. [STUDIES ON THE CONTROL OF POPLAR LEAF RUST. (I) CONTROL TESTS BY FUNGICIDES.] Bull. For. Exp. Sta., Meguro, Tokyo No. 130: 45-50. 2 refs. [Jap.jap.e.]

— Kodama, T., and Aoyama, Y. 1962. [STUDIES ON CONTROL OF POPLAR LEAF RUST. (II) SPRAYING WITH DITHANE AND NARA-MYCN.] Bull. For. Exp. Sta., Meguro, Tokyo No. 139: 177-80. 3 refs. [Jap.jap.e.] Reports further tests with (a) Dithane (1/400 in water) and (b) Nara-mycin (1/2500 in water) using seedlings of a susceptible clone P. × 'Peace'. Dithane was sprayed 5, 10, 15, and 20 times in the growing season, the last being the most effective. A mixture of (a) and (b), however, proved best of all.

Regler, W. 1957. DER KIEFERNDREHROST (MELAMPSORA PINITORQUA), EINE WIRTSCHAFTLICH WICHTIGE INFEKTIONS-KRANKHEIT DER GATTUNG PINUS. [M. PINITORQUA, A PINE DISEASE OF ECONOMIC IMPORTANCE.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 27 (Beitr. Pappelforsch. No. 2): 205-34. 51 refs. [G.g.]

Saric, A., and Milatovic, I. 1960. POKUSSUZIJE BILJANJE TOPOLA U SUMSKOM RASADNIKU BANOVA JARUGA. [A TRIAL OF POPLAR RUST CONTROL IN THE BANOVA JARUGA FOREST NURSERY.] Sum. List 84 (9/10): 290-1. 6 refs. [Croate.]

Schmidle, A. 1953. UBER EINE BLATTKRANKHEIT DER PAPPEL. [A LEAF DISEASE OF POPLAR.] Nachrichtenblatt des Deutschen Pflanzenschutzdienstes, Braunschweig 5(6): 81-3. 7 refs. [G.] Describes a disease observed on Populus marilandica, P. vernirubens, and P. robusta in the Helmstedt district and its pathogen. The fungus is identified with Septotinia populiperda Waterman and Cash, having a conidial form Septotis populiperda (syn. Septoglossum populiperdum Moesz et Smarods). No conclusion is reached on the question whether this fungus is identical, despite difference in symptoms, with Septoglossum populiperdum Johannes.

Schreiner, E. J. 1959. RATING POPLARS FOR MELAMPSORA LEAF RUST INFECTION. U. S. For. Serv. Ntheast. For. Exp. Sta. Res. Note No. 90, 3 pp.

Describes a system successfully used by the author to estimate the pathological effect of the rust on hybrid poplars rating them on a numerical scale from 1 to 100 according to degree of infection on leaves and percent of leaves affected.

Schwenke, H. J. 1960. UNTERSUCHUNGEN UBER DEN PARASITISMUS "ON SEPTOTIS POPULIPERDA WATERMAN ET CASH. [STUDIES ON THE PARASITIC ACTION OF S. POPULIPERDA.] Phytopath. Z. 38(1): 69-92. 26 refs. [G.g.e.] [Cf. Schwenke, 1958, Populus sp., 416.4.]

416.16

Gambogi, P., and Verona, O. 1958. PRESENZA IN ITALIA DI PESTALOTIA POPULI-NIGRAE SAWODA ET K. ITO, CAUSA DI UNA MALATTIA ('SHOOT BLIGHT') DEL PIOPO. [THE OCCURRENCE IN ITALY OF P. POPULI-NIGRAE, CAUSE OF SHOOT BLIGHT OF POPLAR.] Ann. Sper. Agr. (n.s.) 12(4): suppl. pp. i-iii. 2 refs. [It.ite.] The fungus described by the first author as a new species and named Pestalotia lignorum [cf. Gambogi, 1957, P. tremula, 844.1] has now been identified with P. populi-nigrae [cf. Ito, 1950, below].

Gremmen, J. 1962. [POPLAR SHOOT DIE-BACK CAUSED BY SEPTOTINIA PODOPHYLLINA.] Ned. Boschb.-Tijdschr. 34(11): 416-9. 5 refs. [Du.e.]

Describes the symptoms of attack by the fungus, which is common on species and cultivars in the nurseries at Wageningen but has not been observed on older trees. Successful attack occurs only after damage to leaves, e.g., by insects, and control both of the latter and of ascospore discharge, and the use of resistant species and cultivars are recommended.

Ito, K. 1950. CONTRIBUTIONS TO THE DISEASES OF POPLARS IN JAPAN. I. SHOOT BLIGHT OF POPLARS CAUSED BY A NEW SPECIES OF PESTALOTIA. Bull. For. Exp. Sta. Meguro, Tokyo No. 45: 135-46. 27 refs. [E.e.jap.]

Moriondo, F. 1961. ALTERAZIONI S" PIANTE DI PIOPO IN SEGUITO A CRISI DI ATTECHIMENTO. II. IDENTIFICAZIONE DI UN NUOVO PARASSITA PLOPPICOLO. [A DIEBACK OF POPLARS FOLLOWING TRANSPLANTATION SHOCK. II. IDENTIFICATION OF A NEW POPLAR PATHOGEN.] Ann. Accad. Ital. Sci. For. 10: 135-52. 27 refs. [It.f.] The fungus already recorded as a pathogen of hybrid poplars after transplanting has been identified as Phomopsis tirrenica sp. nov. (possibly identical with Fusicoccum populinum). [Cf. Moriondo, 1955, Populus sp., 48.]

416.2

Templin, E. 1960. ANWENDUNGSMOGLICHKEITEN "ON TIEFENWIRKENDEN INSEKTIZIDEN "ND SYSTEMISCHEN MITTELN GEGEN BLATT- "ND TRIEBMINIERENDE INSEKTEN IN DER FORSTWIRTSCHAFT. [THE POTENTIAL USES OF INSECTICIDES WITH DEPTH ACTION AND SYSTEMICS IN THE CONTROL OF LEAF- AND SHOOT-MINING FOREST PESTS.] Proc., 4th Int. Congr. Crop Protection, Braunschweig, Vol. 2: 1321-7. 17 refs. [G.]

416.3

Allegrì, 1959. NOTE PRELIMINARIE SUR LES CAPNODES DES PEULPIERS. [PROVISIONAL NOTE ON CAPNODID SPECIES ON POPLARS.] [Docum.] Int. Poplar Comm. 1st Sess. Wkg. Party on Insects, Rome 1959 No. FAO/CIP/IN/4(Annexe 1), 11 pp. [F.]

Benben, K. 1954. NOWE CHOROBY TOPOLI. [NEW DISEASES OF POPLARS.] Sylwan 98 (2): 91-5. 7 refs. [Pol.]

Harper, A. M. 1959. GALL APHIDS ON POPLAR IN ALBERTA. II. PERIODS OF EMERGENCE FROM GALLS, REPRODUCTIVE CAPACITIES, AND PREDATORS OF APHIDS IN GALLS. Canad. Ent. 91(11): 680-5. 9 refs.

Wong, H. R., McLeod, B. B., and Drovin, J. A. 1963. SAPERDA CALCARATA SAY IN THE ROOT COLLAR OF POPLARS. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. 19(5): 2. 3 refs. The Saperda sp. found tunneling in the root collar of Populus tremuloides and P. balsamifera in Manitoba and Saskatchewan [see F.A. 23, No. 9141 has now been definitely identified as S. calcarata. Further notes are given on its life history.

416.3/5

Good, H. M., and Nelson, J. I. 1962. FOMES IGNIARIUS VAR. POPULINUS. FUNGI ASSOCIATED WITH FOMESIGNIARIUS VAR. POPULINUS IN LIVING POPLAR TREES AND THEIR PROBABLE SIGNIFICANCE IN DECAY. Canad. J. Bot. 40(4): 615-24. 11 refs.

Lohwag, K. 1959. HOLZFAULEN AN PAPPELHOLZ [WOOD-ROTTING FUNGI ON POPLAR.] Istanbul Univ. Orm. Fak. Derg. 9A(1): 1-10. 1 ref. [G.turk.g.turk.]

Discuss & damage by Fomes igniarius on standing trees, and by Stereum purpureum, Polystictus hirsutus and Schizophyllum commune on logs in a storage depot. Preventive and control measures are also discussed.

Thomas, G. P., Etheridge, D. E., and Paul, G. 1960. FUNGI AND DECAY IN ASPEN AND BALSAM POPLAR IN THE BOREAL FOREST REGION, ALBERTA. Canad. J. Bot. 38(4): 459-66. 7 refs. (Contr. Div. For. Biol. Dep. Agric. Can. No. 620.)

416.4

Allen, A. A. 1958. TRYPOPHLOEUS ASPERATUS GYLL. (COL., SCOLYTIDAE) IN KENT AND DORSET. Ent. Mon. Mag. 94(1132): 216. Two records, believed to be the first for the two counties, of the finding of this rare Populus-feeding bark beetle.

Arnold, R. H., and Russell, R. C. 1960. CUCURBITARIA STAPHULA ON POPULUS AND ITS ASSOCIATION WITH MACROPHOMA TUMEFACIENS. *Mycologia* 52(3): 499-512. 20 refs. (Contr. Plant Res. Inst., Res. Br., Dep. Agric., Can. No. 94.)

Baldacci, E., Ciferri, R., Orsenigo, M., and Soaranuzzi, G. 1950. OSSERVAZIONI SUL "CANCRO BATTERICO" DEL PIOPIO IN LOMBARDIA. [OBSERVATIONS ON BACTERIAL CANCER OF POPLAR IN ITALY.] *Notiz. Malatt. Piante* No. 9: 15-25. 10 refs. [It.]

Berbee, J. G. 1962. DEVELOPMENT OF FUSARIUM CANCER OF BLACK POPLARS. *Abstr. in Phytopathology* 52(8): 724.

Bloomberg, W. J. 1959. SOME PHYSIOLOGICAL AND ANATOMICAL CHARACTERISTICS OF POPULUS SPP. AS RELATED TO INFECTION BY CYTOSPORACHRYOSPERMAFR. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 15(2): 3.

——— 1962. CYTOSPORA CANCER ON POPLAR. [A] FACTORS INFLUENCING THE DEVELOPMENT OF THE DISEASE. [B] THE MOISTURE RELATIONS AND ANATOMY OF THE HOST. *Canad. J. Bot.* 40(10): 1271-92. 27 refs. (Contr. For. Ent. Path. Br. Dep. For. Can. Nos. 828 and 841.)

——— and Farris, S. H. 1963. CYTOSPORA CANCER OF POPLARS: BARK WOUNDING IN RELATION TO CANCER DEVELOPMENT. *Canad. J. Bot.* 41: 303-10. 13 refs. (Contr. For. Ent. Path. Br. Dep. For. Can. No. 882.)

Bohm, A. 1957. DOTHICHIZA POPULEA SACE. ET BR. KAO UZROČNIK PROPADANJA TOPOLA S POSEBNIM OSVRTOM NA JAKU ZAVAZU U PROLJECE 1956 UHRVATSKOJ. [D. POPULEA AS A CAUSE OF POPLAR MORTALITY, WITH PARTICULAR REFERENCE TO THE SPRING 1956 OUTBREAK IN CROATIA.] *Sum. List* 81(1/2): 13-30. 22 refs. [Croat.e.]

Brink, G. 1949. VERSLAG VAN HET ONDERZOEK NAAR DE POPULIERENKANKER IN 1947. [REPORT ON INVESTIGATIONS IN 1947 ON BACTERIAL CANCER OF POPLARS.] *Mededelingen van de Nederlandsche Heidemaatschappij*, Arnhem No. 8, 10 pp. [D.u.e.] *Resistance tests were continued, but the warm, dry summer appeared to be unfavorable for the formation of canker. Many species of bacteria, one of which had some effect on Populus candicans but was not identical with Pseudomonas rimaefaciens already isolated, and some fungi were isolated from slime and diseased tissue. [Cf. Pelkewijk and Brink, 1947?, Populus sp., 443.1]*

——— and Ende, G. van den. 1951. VERSLAG VAN HET ONDERZOEK NAAR DE POPULIERENKANKER IN 1948 EN 1949. [REPORT ON INVESTIGATIONS IN 1948 AND 1949 ON BACTERIAL CANCER OF POPLARS.] *Mededelingen van de Nederlandsche Heidemaatschappij*, Arnhem No. 13, 15 pp. [D.u.e.]

Butin, H. 1957. DIE BLATT- UND RINDENBEWOHNENDEN PILZDER PAPPEL UNTER BESONDERER BERÜCKSICHTIGUNG DER KRANKHEITSERREGER. [THE LEAF- AND BARK-INHABITING FUNGI OF POPLARS, WITH SPECIAL REFERENCE TO PATHOGENIC SPECIES.] *Mitt. Biol. Bundesanst. Land- u. Forstw.*, Berlin No. 91, 64 pp. 20 refs. [G.] *Lists 94 leaf- and 51 bark-inhabiting species, their synonyms, morphology, injuries, and hosts (including differential susceptibility). A preliminary chapter presents tabulated data on the frequency and distribution over the stem, of 20 species found on 5-year-old trees of Populus "canadensis" cv. robusta which had been killed by Dothichiza populea but were still standing.*

——— 1958. UNTERSUCHUNGEN ÜBER EIN TOXIN IN KULTURFILTRATEN "ON DOTHICHIZA POPULEA SACC. ET BR. [STUDIES ON A TOXIN IN CULTURE FILTRATES OF D. POPULEA.] *Phytopath. Z.* 33(3): 135-46. 16 refs. [G.g.e.]

Cumaevskaja, M. A. 1957. BAKTERIAL'NYJ RAK TOPOLJA. [BACTERIAL CANCER OF POPLAR.] *Dokl. Vsesojuz. Akad. Sel.-Hoz. Nauk. Lenina* 1957(3): 40-4. 7 refs. [Russ.]

Donaubauer, E. [1957.] ZUR KENNNTNIS "ON CHONDROPLEA POPULEA (SACC.) KLEB. (SYN: DOTHICHIZA POPULEA SACC. ET BRIARD), DEM ERREGER DES PAPPELRINDENTODES. [OUR KNOWLEDGE OF D. POPULEA.] *Gemeinschaft zur Förderung der Pappelkultur in Österreich*, Wien. 14 pp. 15 refs. [G.] *Describes, chiefly for the practical forester, the symptoms and*

course of the disease, conditions favoring infection, prophylaxis (silvicultural, chemical and by resistance breeding) and control (mechanical) and gives data on the extent of the epidemic in Austria.

Eichbaum, K. 1956. ZUMPAPPELRINDENTOD—DOTHICHIZA POPULEA. [NOTES ON D. POPULEA.] *Allg. Forstzeitschr.* 11(27/28): 352-4. [G.]

A discussion of symptoms, secondary injuries caused, conditions favoring infestation, practical experiences, etc.

Eimern, J. van. 1956. DIE WITTERUNG IM WINTER 1954-55 UND IM FRÜHJAHR 1955 UND IHRE MÖGLICHE BEDEUTUNG FÜR DEN RINDEN TODDER PAPPEL. [THE WEATHER OF THE WINTER 1954-55 AND SPRING 1955, AND ITS POSSIBLE SIGNIFICANCE IN CONNECTION WITH THE DOTHICHIZA POPULEA EPIDEMIC.] *Forstarchiv* 27(2): 30-4. 4 refs. [G.g.]

——— 1956. KANN DIE WITTERUNG IM WINTER 1954-55 UND IM FRÜHJAHR 1955 FÜR DEN RINDENTOD DER PAPPEL VERANTWORTLICH SEIN? [CAN THE WEATHER IN WINTER 1954-55 AND SPRING 1955 BE RESPONSIBLE FOR THE DOTHICHIZA POPULEA DISEASE OF POPLARS?] *Holzzucht, Reinbek* 10(2): 10-3. 4 refs. [G.]

Ende, G. van den. 1955. VERSLAG "AN HET ONDERZOEK NAAR DE POPULIERENKANKER IN 1952 EN 1953, VEROOERZAAKT DOOR PSEUDOMONAS SYRINGAEV. HALL. F. SP. POPULEA SABET. [REPORT ON INVESTIGATIONS IN 1952 AND 1953 ON CANCER OF POPLARS CAUSED BY P. SYRINGAEV. SP. POPULEA.] *Mededelingen van de Nederlandsche Heidemaatschappij*, Arnhem No. 21, 19 pp. [D.u.e.]

——— 1957. HET ONDERZOEK OVER DE POPULIERENKANKER VEROOERZAAKT DOOR PSEUDOMONAS SYRINGAEV. HALL F. SP. POPULEA SABET. [STUDIES ON CANCER OF POPLARS CAUSED BY P. SYRINGAEV. SP. POPULEA.] *Meded. van de Landb. Hogesch. en de Opzoekingsstations van de Staat te Gent* 22(3): 527-34. 10 refs. [D.u.e.] *(Nagende Jaarlijks Symposium over Phytopharmacie, Gent 1957.)*

Surveys research by the author [above reference] and others since 1937.

Györfi, J. 1954. A NYARKEREGHALAL ES A NYARFATAK MAGYAR-ORSZÁGI KAROSITASA. [DAMAGE TO POPLARS FROM BARK DECAY AND CANCER IN HUNGARY.] *Erdesz. Kutatas.*, Budapest No. 3: 105-14. 19 refs. [Hue.g.]

Herpka, I. 1956. POJAVA UGIBANJA KORE NA TOPOLAMA (PRETHODNI IZVJESTAJ). [BARK DISEASE OF POPLARS (PRELIMINARY COMMUNICATION).] *Sum. List* 80(9/10): 282-99. 14 refs. [Croat. Croat.]

Reports and describes in some detail cases of bark disease (not the first time reported) caused by the fungus Dothichiza populea in nurseries, clones, young and old plantations, and old poplar stands in Croatia. Populus candicans was found to be relatively the most resistant species.

——— 1960. NOVA POJAVA ODUMIRANJA KORE NA TOPOLAMA. [NEW OCCURRENCE OF BARK NECROSIS ON POPLARS.] *Topola*, Beograd No. 15: 19-21. [Serb.f.]

The disease, noted on young poplars in nurseries in N. Yugoslavia since 1956, is always found on shaded plants in excessively wet soils, and is believed to be a physiological disorder.

Hubbes, M. 1959. UNTERSUCHUNGEN ÜBER DEN ERREGER DES RINDENBRANDES DER PAPPEL. [EXPERIMENTS ON DOTHICHIZA POPULEA.] *Forstarchiv* 30(2): 25-9. [G.]

——— 1959. UNTERSUCHUNGEN ÜBER DOTHICHIZA POPULEA SACC. ET BRIARD, DEN ERREGER DES RINDENBRANDES DER PAPPEL. [EXPERIMENTS ON D. POPULEA.] *Phytopath. Z.* 35(1): 58-96. 83 refs. [G.g.e.]

Joachim, H. -F. 1958. ÜBER DEN BRAUNFLECKENGRIND. [THE POPLAR BARK DISEASE 'BRAUNFLECKENGRIND'.] *Allg. Forstzeitschr.* 13(38): 548-51. 10 refs. [G.g.]

——— 1960. ÜBER HAGELSCHADEN AN PAPPELN. [HAIL DAMAGE TO POPLARS.] *Arch. Forstw.* 9(3): 259-65. 2 refs. [G.russ.e.]

Kalandra, A. 1961. ['BRAUNFLECKENGRIND' OF POPLARS IN BOHEMIA.] *Sborn. Čsl. Akad. Zemed. Ved. (Lcsn.)* 7(6): 591-6. 19 refs. [Cz.cz.russ.g.]

Discusses its distribution in Czechoslovakia, species affected and associated pests and diseases.

———. 1961. [POPLAR CANCER.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 7(7) : 599-604. 35 refs. [Cz.cz.russ.g.] Discusses the cankers caused by *Pseudomonas rimefaciens* and *Nectria galligena* and their occurrence, so far on a relatively small scale, in Czechoslovakia.

Kochman, J. 1957(1958). ZGORZEL KORY TOPOLI POWODOWANA PRZEZ GRZYB VALSA SORDIDA NITSCHKE I WARUNKI JEJ WYSTĘPOWANIA W POLSCE. [BARK NECROSIS OF POPLARS CAUSED BY THE FUNGUS V. SORDIDA, AND ITS OCCURRENCE IN POLAND.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 12: 67-103. 30 refs. [Pol.russ.g.]

Krstic, M. 1958. "KRSTAVOST" TOPOLA, JEDNA NEZABELEŽENA FITOPATOLOŠKA POJAVA KOD NAS. ["SCABBINESS" OF POPLAR, NOT HITHERTO REPORTED IN YUGOSLAVIA.] Topola, Beograd No. 8: 667-72. 6 refs. [Serb.f.] Describes the bark disease called in Germany 'Braunflecken-grind' [cf. F.A. 19, Nos. 2101, 3105] and reports the locations in Serbia where it was found by the author and where *P. × serotina* wood was most affected, *P. × robusta* and *P. × marilandica* wood less so.

Leontovyc, R. 1960. PRISPEVOK K POZNANIU DO THICHIZA POPULEA SACC. ET BRIARD NA SLOVENSKU. I. ROZŠÍRENIE A VYVOJOVE CYKLY SO SYMPTOMATIKOU. [D. POPULEA IN SLOVAKIA. I. DISTRIBUTION, DEVELOPMENT CYCLES AND SYMPTOMS.] Ved. Prace Vyskum. Ust. Lesn. Hosp. Bansk. Stiav. No. 1: 233-56. 11 refs. [Slovak.slovak.russ.g.]

Magnani, G. 1958. LA DIFFUSIONE E L'IMPORTANZA DELLA CYTOSPORA SUI PIOPPI. [OCCURRENCE AND IMPORTANCE OF CYTOSPORA ON POPLARS.] Ital. For. Mont. 13 (1) : 23-8. 21 refs. [It.f.]

———. 1959(1960). RICERCHE SULLA NECROSI CORTICALE DEL PIOPPO DA DO THICHIZA POPULEA SACC. ET BRIARD. [BARK NECROSIS OF POPLARS CAUSED BY D. POPULEA.] Pubbl. Cent. Sper. Agric. For., Roma No. 3: 77-126. 47 refs. [It.it.e.e.]

Meiden, H. A. van der. 1961. PLANTAFSTAND EN BASTVLEKKENZIEKTE BIJ POPULIER. [PLANT SPACING AND "BARK SCAB DISEASE" OF POPLARS.] Ned. Boschb.-Tijdschr. 33(7) : 206-10. 4 refs. [Dut.e.g.g.]

Müller-Stoll, W. R., and Hartmann, U. 1950. UBER DEN CYTOSPORA-KREBS DER PAPPEL (VALGASORDIDA NITSCHKE) UND DIE BODINGUNGEN FÜR CINE PARASITÄRE AUSBREITUNG. [THE CYTOSPORA CANCER OF POPLAR (V. SORDIDA) AND CONDITIONS FOR ITS PARASITIC SPREAD.] Phytopath. Z. 16(4) : 445-78. 38 refs. [G.g.] Describes the species and symptoms of its attack on poplar, and discusses its distribution, conditions favoring parasitic attack, and control methods by ensuring adequate water supply especially to young trees, avoiding damage to the trees and removing all infested material.

Nather, H. 1954. ZUM MASSEN AUFTRETEN "ON "RINDENTOD" AN PAPPELJUNGKULTUREN IM JAHRE 1953. [THE MASS OCCURRENCE OF BARK DYING IN YOUNG POPLAR PLANTATIONS IN 1953.] Allg. Forstztg. 65(1,2) : 9-10. [G.] Cytospora chrysosperma and Dothichiza populea did great damage to mostly bottom-land plantations in the exceptionally hot and dry summer of 1953. Populus deltoides var. missouriensis frequently showed infection at the base of last year's terminal shoot. P. 'carolina' frequently at the base of the stem, where the wounds were more readily concluded. Large leaved varieties, which frequently lost their leaves that summer, were generally more susceptible. Mistakes (drying out) in planting, dryness of site, injuries, and damage by fertilizers are discussed.

Oldenkamp, L. 1961. DE BASTVLEKKENZIEKTE. [THE 'BARK SCAB DISEASE'.] Ned. Boschb.-Tijdschr. 33(7) : 203-5. 12 refs. [Dut.] Reviews literature, mainly European, on its occurrence on hardwoods, especially poplars, concluding that fungi and bacteria and possibly a virus may be considered primary causative agents, and that abiotic factors (water relations and perhaps frost damage and insolation) may be important. [Cf. Joachim, 1958, and Rambelli, 1959, this subject classification.]

Peno, M. 1960. PSEUDOMONAS SF. NA TOPOLI. [PSEUDOMONAS SP. ON POPLAR.] Topola, Beograd No. 17 18: 17-9. [Serb.f.]

Studies on *Pseudomonas* infections of *Populus × robusta* and *P. serotina* at Mol suggest that *Pseudomonas* is in symbiosis with other bacteria favorable to its development, forming a tumor-like canker. The tree's general development is not greatly affected (though the volume of damage has not been calculated), but the wounds admit secondary pests.

Petrovic, N. 1958. STETNI GLODARI U TOPOLICIMA. [RODENTS CAUSING DAMAGE TO POPLAR STANDS.] Topola, Beograd No. 6: 469-75. 8 refs. [Serb.]

Rodents destructive to the bark of poplar trees in the Danube and Tisa valleys are *Arvicolaterrestris* and *Microtus arvalis*. A rapid increase in their population has occurred recently, as natural enemies are few. The damage is caused primarily after floods and during winter when food is scarce. Suggestions are made for control by poison bait.

Rambelli, A. 1959. INTORNO AD UNA GRAVE FISIOPIATIA DEL PIOPPO. [A SERIOUS DISORDER OF POPLAR.] Monti e Boschi 10(1) : 25-9. [It.f.e.]

Gives a detailed description, with illustrations of the lesions occurring in bacterial canker of poplar, now very widespread in Italy, and briefly discusses possible predisposing factors.

———. 1959. LA COSIDDETTA BATTERIOSI DEL PIOPPO. [THE 'BACTERIAL DISEASE' OF POPLAR.] Pubbl. Cent. Sper. Agric. For., Roma 2: 233-42. 8 refs. [It.it.e.e.] Discusses factors possibly involved in the disorder, e.g., insolation; root competition; pedological and hydrological disequilibrium; and over-wide spacing in plantations on fresh soils. [Cf. Vivani, 1959, *P. canadensis* to *P. davidiana*, 443.3.]

———. 1963. [FURTHER INVESTIGATIONS ON THE SO-CALLED BACTERIAL DISEASE OF POPLAR.] Pubbl. Cent. Sper. Agric. For., Roma 6: 95-115. 3 refs. [It.it.e.]

Observations on 18 plantations of hybrid poplars confirm the nonbiotic nature of the disorder, believed to be due to root competition in soils with a gravel subsoil or rapid drainage. The influence of spacing on the severity of the disorder is stressed.

Rettelbach, B. 1953. WUHLMAUSBEKÄMPFUNG MIT DER HERZSCHENPATRONE. [CONTROL OF ARVICOLATERRESTRIS WITH THE HERZ FUMIGATING CARTRIDGE.] Forst u. Holz 8(21) : 306-8. [G.]

Ride, M. 1958. SUR L'ETIOLOGIE DU CHANCRE SUIVANT DU PEULIER. [THE ETIOLOGY OF THE BLEEDING CANCER OF POPLAR.] C.R. Acad. Sci., Paris 246(19) : 2795-8. 6 refs. [F.] Cultures of *Aplanobacterium populi* sp. nov., isolated from cankers of *Populus × euramericana* and *P. tremula*, produced the characteristic cankers when inoculated into the trees at intervals over 2 years. Its characteristics in culture are described.

Rogers, J. D. 1963. HYPOXYLON CANCER OF ASPEN. I. SCREENING FOR DISEASE RESISTANCE. II. DEVELOPMENTAL MORPHOLOGY AND CYTOLOGY OF HYPOXYLON PRUNATUM. Abstr. of thesis, in Dissert. Abstr. 23(11) : 4061-2. [Univ. Wis.] Includes data on six inoculation methods, and on the relative resistance of a number of poplar species and hybrids.

Sabet, K. A. 1952. A DISCUSSION OF THE CAUSE OF THE BACTERIAL DIE-BACK AND CANCER DISEASE OF POPLAR. Ned. Boschb.-Tijdschr. 24(5) : 126-9. 7 refs. [E.du.] Briefly describes studies leading to the conclusion that *Pseudomonas syringae* f. sp. *populae* is responsible for bacterial dieback and canker of poplar. Details of the studies will be published elsewhere.

———. 1953. STUDIES IN THE BACTERIAL DIE-BACK AND CANCER DISEASE OF POPLAR. II THE RELATION BETWEEN THE BACTERIAL SLIME AND THE CAUSAL ORGANISM. Proc. Soc. for Applied Bacteriology, Reading 16(1) : 45-55. 8 refs.

———. 1953. STUDIES IN THE BACTERIAL DIE-BACK AND CANCER DISEASE OF POPLAR. III. FREEZING IN RELATION TO THE DISEASE. Ann. Appl. Biol. 40(4) : 645-50. 9 refs.

——— and Dowson, W. J. 1952. STUDIES IN THE BACTERIAL DIE-BACK AND CANCER DISEASE OF POPLAR. I. THE DISEASE AND ITS CAUSE. Ann. Appl. Biol. 39(4) : 609-16. 11 refs.

Sanz Pastor, J. M. 1956. RESULTATS DE L'ENQUETE SUR DO THICHIZA POPULEA. REPONSE A "QUESTIONNAIRE FAO-CIP/MAL, 1 SUR

LEDOTHICHA POPULEA SACC. ET BRIARD (=CONDROPLEA POPULEA KLEB.) ET RENSEIGNEMENTS SUR QUELQUES AUTRES CHANCRES DU PEUPLIER DUS A DES CHAMPIGNONS OU A DES BACTERIES. [RESULTS OF THE INQUIRY ON D. POPULEA. SPAN. REPLY TO THE QUESTIONNAIRE FAO/CIP/MAL/1 ON D. POPULEA AND INFORMATION ON SOME OTHER CANKERS CAUSED BY FUNGI OR BACTERIA.] [Pap.] Int. Poplar Comm. No. FAO/CIP/MAL/2-C, 1 p. [F.]

Savelj, M. 1957. TOPOLOV RAK (VALSA SORDIDA NITSCH.). [POPULAR CANKER CAUSED BY V. SORDIDA.] Gozd. Vestn. 15(2/3): 81-7. 4 refs. [Sloven.]

Investigations carried out in Slovenia in 1955-56 seem to show that the poplars affected with this canker were weakened as a result of (1) wrong planting methods, (2) unfavorable water regime, and (3) extremes of temperature, these factors having lessened the natural resistance of the trees.

Schmidle, A. 1953. DIE CYTOSPORA-KRANKHEIT DER PAPPEL UND DIE BEDINGUNGEN FÜR IHRAUFTRETEN. [THE CYTOSPORA DISEASE OF POPLAR AND CONDITIONS FAVORING ITS OCCURRENCE.] Phytopath. Z. 21(1): 83-96. 34 refs. [G.]

1953. ZUR KENNTNIS DER BIOLOGIE UND DER PATHOGENITÄT "ON DOTHICHA POPULEA SACC. ET BRIARD, DEM ERREGER EINES RINDENBRANDES DER PAPPEL. [THE BIOLOGY AND PATHOGENICITY OF D. POPULEA, THE CAUSE OF A BARK-SCORCH OF POPLAR.] Phytopath. Z. 21(2):189-209. 52 refs. [G.g.]

Schonhar, S. 1953. UNTERSUCHUNGEN ÜBER DIE BIOLOGIE "ON DOTHICHA POPULEA (ERREGER DES PAPPELRINDENTODS). [THE BIOLOGY OF D. POPULEA, CAUSE OF POPLAR BARK DISEASE.] Forstwiss. Cbl. 72(11/12): 358-68. 6 refs. [G.]

1956. BRAUNFLECKEN GRIND UND RINDENTOD DER PAPPEL. ["BRAUNFLECKENGRIND" AND THE POPLAR DISEASE CAUSED BY DOTHICHA POPULEA.] Allg. Forstzeitschr. 11(27/28): 349-52. 5 refs. [G.g.]

1957. EIN BEITRAG ZUR FRAGE DER ANFALLIGKEIT VERSCHIEDENER PAPPELARTEN UND PAPPELSORTEN GEGEN DOTHICHA POPULEA. [THE SUSCEPTIBILITY OF VARIOUS POPLARS TO D. POPULEA.] Mitt. Ver. Forstl. Standortskunde Forstpfl. Zucht. No. 6: 59-62. 4 refs. [G.]

1960. UNTERSUCHUNGEN ÜBER DIE ANFALLIGKEIT VERSCHIEDENER PAPPELSORTEN GEGEN DOTHICHA POPULEA. [THE SUSCEPTIBILITY OF VARIOUS POPLAR VARIETIES TO D. POPULEA.] Allg. Forst- u. Jagdztg. 131(11): 259-61. 7 refs. [G.g.e.]

1963. [A FURTHER CONTRIBUTION TO THE SUSCEPTIBILITY OF VARIOUS POPLAR VARIETIES TO DOTHICHA POPULEA.] Allg. Forst- u. Jagdztg. 134(2): 57-60. 3 refs. [G.g.e.]

Schwenke, H. J. 1958. BEITRÄGE ZUR BIOLOGIE UND ZUM PARASITISMUS "ON SEPTOTIS POPULIPERDA WATERMAN ET CASH. [ON THE BIOLOGY AND PARASITIC ACTION OF S. POPULIPERDA.] Abstr. of thesis, in Forsch. u. Berat. (Forstsw.) Landesausssch. Landw. Forsch. Landes Nordrhein-Westfalen No. 3: 102-6. [G.]

Shea, K. R. 1963. INDUCTION OF HYPOXYLON CANKERS IN ASPENS BY ARTIFICIAL INOCULATION. For. Sci. 9(1): 2-7. 12 refs.

An extended account, reporting no success with spores and highly significant differences in percent infection with inocula from various culture media and between plots. The covering or not covering of the wound made no difference.

and Kuntz, J. E. 1956. INOCULATION OF ASPENS WITH HYPOXYLON PRUINATUM (KL.) CKE. For. Res. Note Wis. Coll. Agric. No. 27, 2 pp.

A study was made in order to develop a satisfactory method for the artificial infection of poplars when testing susceptibility in the course of breeding experiments. Populus tremuloides and P. grandidentata, 2-4 in. in diam., were used. Best results (82% infections) were obtained by inserting mycelium grown on oat-wheat substrata into a slit in the bark and covering the wound with adhesive tape.

Stefanov, D., Zasev, B., and Canova, P. 1961. KAFJAVOSLIZOTEČENIE I NJAKOI GABI PO STABLATA I KLONITE NA TOPOLOV NA BALKARIJA. ["BRAUNFLECKENGRIND," AND SOME FUNGI ON STEMS

AND BRANCHES OF POPLARS IN BULGARIA.] Nauc. Trud. Lesoteh. Inst., Sofia 9: 143-56. 13 refs. [Bulg.g.]

Szilagyi, L. 1961. A NYARFARAK ELLENI VEDEKEZES LEHETOSÉGEI. [CONTROL OF POPLAR CANKER.] Erdo 10(10): 417-23. [Hu.russ.g.]

Szontagh, P. 1961. A TARKA EGERORMANYOS (CRYPTORRHYNCHUS LAPATHI L.) MINT NEMESNYAR ANYATELEPEINK KAROSITOJA. [THE WILLOW BORER AS A PEST OF POPLAR NURSERIES.] Erdo 10(7): 303-7. [Hu.russ.g.]

Taris, B. 1959. CONTRIBUTION A L'ETUDE DES MALADIES CRYPTOGAMIQUES DES RAMEAUX ET DES JEUNES PLANTS DE PEUPLIER. [FUNGUS DISEASES OF TWIGS AND YOUNG PLANTS OF POPLAR.] [Docum.] Int. Poplar Comm., 2nd Sess. Wkg. Party on Diseases, Rome 1959 No. FAO/CIP/MAL/10, 13 pp. [F.]

Toth, I. 1958. UJABB MEGFIGYELESEK A "NYARFARAKROL." [NEW OBSERVATIONS ON POPLAR CANKER.] Erdo 7(11): 420-4. [Hu.russ.g.] Reports 2 years' studies on the effect of plant handling, banding and individual resistance to the spread of the disease. Cutting back is useful; banding has no effect; the connection between bark necrosis and frost is quite undetermined. The resistance of 38 clones is tabulated.

Toth, J. 1957. MEGFIGYELESEIM A NYARFARAKROL. [OBSERVATIONS ON DOTHICHA CANKER OF POPLARS.] Erdo 6(7): 251-6. [Hu.] From abstr. in Hung. Agric. Rev. 7(1):11-12. 1958. [E.]

Urošević, B. 1961. [THE CAUSE OF 'BRAUNFLECKENGRIND' OF POPLARS.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 7(7): 605-18. 21 refs. [Cz.cz.russ.g.]

Organisms isolated from infections were: (a) *Corynebacterium* sp., (b) semiparasitic fungi, e.g., *Dothichiza populea*, *Phomopsis putator*, and (c) epiphytic fungi. No antagonism was found between (a) and fungi of (b) in culture. A new *Corynebacterium* sp., distinct from (a), was isolated from necrotic tissues of *Populus berolinensis*, *P. simonii* and *P. robusta* and this needs further study. [Cf. Oldenkamp, 1961; Meiden, 1961; and Stefanov, Zasev, and Canova, 1961; all this subject classification.]

Vanderwalle, R. 1953. NOTE SUB L'ETIOLOGIE DU CHANCRE DU PEUPLIER. [THE ETIOLOGY OF POPLAR CANKER.] Parasitica, Gembloux 9(4): 119-24. 4 refs. [F.]

Veldeman, R., and Welvaert, W. 1960. SCHORSBRAND BIJ POPULIER. [POPLAR CANKER.] Meded. Landb. Hogesch. Gent 25(3/4): 1107-15. [Du.du.f.e.g.]

Vlasov, A. A. 1956. RAKOVYE ZABOLEVANIJA JASENJA, DUBA, KLENA I TOPOLJA. [CANKERS OF ASH, OAK, MAPLE, AND POPLAR.] Sborn. Rabot. Lesn. Hoz., VNIILM, Moskva No. 32: 243-57. [Russ.]

Types of cankers, predisposing factors, control, etc.

Waterman, A. M. [1954.] SEPTORIA CANKER OF POPLARS IN THE UNITED STATES. Circ. U. S. Dep. Agric. No. 947, 24 pp. 24 refs.

1957. CANKER AND DIEBACK OF POPLARS CAUSED BY DOTHICHA POPULEA. For. Sci. 3(2): 175-83. 20 refs.

Wettstein, W. von, and Donaubaue, E. 1958. SURVEY OF DOTHICHA POPULEA. Austria. [Docum.] 14th Sess. Stand. Exec. Comm. Int. Poplar Comm., Rome 1958 No. FAO/CIP/CP/16-A, 6 pp.

Discusses distribution, symptoms, time of occurrence and location of the disease, types of poplar most susceptible, sites and water balance, prevention and control, including experiments. Spraying with Cu_2OCl_2 in May and mid-August reduced mortality of *Populus robusta* saplings from 13% (controls) to 1%. A Dutch preparation, Kankerdoed, and Agromycin 100 are also being tested.

Zivojinovic, D. 1956. SUŠENJE TOPOLA NA DELIBLATSKOJ PESČARI. [POPLAR MORTALITY ON THE DELIBLATA PESCARA.] Sumarstvo 9(11/12): 721-4. 5 refs. [Serb.e.f.]

Records heavy mortality in 1956 of 3- to 5-year poplar plantations as a result of attack by *Dothichiza populea*. The trees had suffered frost damage 3 months earlier. Damage was greatest to *P. robusta*, *P. serotina*, and *P. nigra* var. *italica*. The most resistant were *P. alba*, *P. nigra*, and *P. 'Bachofeni'*.

416.4/5

Lekander, B. 1963. [XYLEBORUS CRYPTOGRAPHUS (COL. IPIDAE): ITS DISTRIBUTION [IN SCANDINAVIA] AND BIOLOGY.] Ent. Tidskr., Stockh. 84(1/2): 96-109. 17 refs. [G.]

Mocanu, V. 1957. CONTRIBUTII LA STUDIUL BIOLOGIEI CIUPERCII TRAMETES GALLICA FR. F. TROGII BERK. [STUDIES OF THE BIOLOGY OF T. GALLICA F. TROGII.] An. Inst. Cerc. Silv., Bucuresti (Ser. 1) 18: 95-108. 7 refs. [Rum.russ.f.]

Detailed report on laboratory cultures and successful inoculation of healthy poplars with them. [Cf. F.A. 20, No. 2010.1]

[New Zealand: Soil Conserv. Rivers Control Coun.] 1959. POPLAR INVESTIGATIONS. Extr. from Report, Soil Conservation and Rivers Control Council. Wellington 1958/1959: 26-9.

Peno, M. 1962. [THE BROWN SCAB DISEASE OF POPLARS AND WILLOWS.] Topola, Beograd 6(25/26): 19-21. [Serb.] Discusses symptoms, susceptibility of clones, and (silvicultural) control by using plants propagated from young stock rather than from old stools, by avoidance of clones highly susceptible to fungal diseases and by early cutting of infected stands.

Raeder-Roitzsch, J. E., and Khattat, A. R. 1962. EPIDEMIC OUTBREAK OF MELANOPHILA PICTA PALL. IN IRRIGATED POPLAR PLANTATIONS IN IRAQ. [Docum.] 2nd FAO Near East Poplar Conf., Turkey 1962 No. FAO/NEPC/62/6, 13 pp. [E.e.]

Yang, Y. -C., Chou, S. -H., Li, C. -L., and others. 1957. [PRELIMINARY INVESTIGATIONS ON THE SMALL POPLAR AEGERIID (PARANTHRENE TABANIFORMIS RTT.) IN THE ENVIRONS OF THE CITY OF PEKING.] Acta Entomologica Sinica, Peking 7(1): 89-104. 8 refs [Chin.chin.russ.]

416.5

Arru, G. M. [1952.] [THE INFLUENCE OF SOIL CONDITIONS ON THE SUSCEPTIBILITY OF POPLARS TO AGRILUS VIRIDIS VAR. POPULNEAE IN NORTHERN ITALY.] Proc., 5th World For. Congr., Seattle 1960, Vol. 2, Sect. 3C: 948-50. [F.e.span.]

Black, R. L. 1953. A WHITE TRUNK ROT OF POPLAR CAUSED BY "FUNGUS A." Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 9(5): 2. About 10% of poplars in Whiteshell Forest Reserve, Man., were found to be infected with this so-far-unidentified fungus; it is generally prevalent in the Prairie Provinces and has also been found in Ontario. In cross section the incipient decay is light to rusty red with an undulating margin. In longitudinal section the advanced decay is made up of streaks of dark firm wood mixed with pockets of yellow rotten wood. The rot has a faint cheese-like odor.

Brizzi, G. 1962. [DAMAGE TO YOUNG POPLARS BY PARANTHRENE [SCIAPTERON] TABANIFORMIS.] Informatore Fitopatologico, Bologna 12(6): 81-5. [It.] Reports extensive damage to young poplar (1-4 years) in the neighborhood of Florence, with details of the injuries caused and of the life history of the insect. Control in the nursery is easily carried out by spraying repeatedly with synthetic chlorides with or without the addition of parathion. Preliminary trials indicate that control in the field can be obtained by brushing on to the stems a mixture of paraffin and parathion and repeating at weekly intervals.

Ceianu, I. 1961. PARANTHRENE TABANIFORMIS ROTT., UN DAUNATOR AL PLOPULUI PUTIN CUNOSCUT IN R.P.R. [P. TABANIFORME, A PEST OF POPLAR LITTLE KNOWN IN ROMANIA.] Rev. Padurilor 76(4): 242-5. 11 refs. [Rum.russ.g.f.e.] A general account of the pest, its distribution, species attacked, and control measures, largely drawn from Russian literature.

Clausen, V. H., and Kaufert, F. H. 1952. OCCURRENCE AND PROBABLE CAUSE OF HEARTWOOD DEGRADATION IN COMMERCIAL SPECIES OF POPULUS. J. For. Prod. Res. Soc. 2(4): 62-7. 14 refs.

Cramer, H. H. 1954. UNTERSUCHUNGEN UBER DEN GROSSEN PAPPELBOCK, SAPERDA CARCHARIAS L. [INVESTIGATIONS ON S. CARCHARIAS.] Z. Angew. Ent. 35(4): 425-58. Many refs. [G.g.]

Ende, G. van den. 1951. DE KLEINE POPULICRENBOKTOR (SAPERDA POPULNEA L.) EN ZIJN BESTRIJDING. [S. POPULNEA AND ITS CON-

TROL.] Ned. Boschb.-Tijdschr. 23(5): 145-7. 5 refs. [Du.] Summarizes the main points in a paper by Breny [1950, Populus sp., 453].

Georgopoulos, A. 1957. BESTEHT ZWISCHEN LANGE DERFRASSGANGE, DICKE DER BEFALLENE STELLEN UND DEM GEWICHT DER RAUPEN "ON SCIAPTERON TABANIFORME EINE BEZIEHUNG? [IS THERE A CORRELATION BETWEEN THE LENGTH OF THE LARVAL GALLERIES, DIAMETER OF THE STEM PORTION ATTACKED AND THE WEIGHT OF LARVAE OF S. TABANIFORME?] Anz. Schadlingsk. 30(5): 74-6. 2 refs. [G.] No correlation could be found between length of larval galleries, diameter of the stem portion attacked and weight of larvae, nor yet between the height of the stem portion attacked and length of larval galleries.

Good, H. M. 1959. FUNGI ASSOCIATED WITH FOMES IGNIARIUS IN DECAY OF POPLAR. Abstr. in Proc. 9th Int. Bot. Congr., Montreal, Vol. 2: 136.

Guasp, J. T. 1955. LUTTE CONTRE LES PARASITES TEREBRANTS D'PEUPLIER. [CONTROL OF POPLAR BORERS.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955. No. FAO/CIP/75-K Add. 5, 3 pp. [F.]

A plantation of 60,000 poplars (3-4 cm. diam.), of which 18,000 were infested by borers, mainly Sesia apiformis and Saperda populnea (averaging two larvae/tree) was successfully treated by injecting a preparation containing 2.5% DDT plus 2.5% BHC, into the larval holes. Using a crew of three men-two to clear the holes with a piece of wire and one to inject the insecticide—the total cost per tree was 0.3 pesetas.

Kailides, D. S. 1962. [THE BIOLOGY AND CONTROL OF SCIAPTERON TABANIFORMIS IN GREECE.] [Pub.] For. Res. Inst., Minist. Agric., Athens No. 6, 15 pp. 22 refs. [G.k.e.]

Klug, W. 1954. DIE BALSAMPAPPELN ALS FANGBAUME. [BALSAM POPLARS AS TRAP TREES.] Allg. Forstztg. 65(11/12): 155-6. [G.] The author's suggestion is based on an observation made on individual trees of Populus simonii, interspersed in stands of P. robusta and P. angulata. The former were heavily infested with Saperda carcharias and Cossus cossus, and were riddled with woodpecker holes from base to man's height, while the latter were hardly affected.

Kudler, J., and Hochmut, R. 1958. KOZLICEK OSIKOVY A MOZNOSTI BOJE PROTI NEMU. [SAPERDA POPULNEA AND ITS CONTROL.] Lesn. Prace 37(4): 174-9. [Cz.] Describes the effects of S. populnea attack on Populus spp. in Czechoslovakia and briefly discusses various methods of chemical and biological (involving a parasite, Billaea irrorata) control.

Temlova, B., and Hochmut, R. 1961. ZUR FRAGE DES PAPPELSORTIMENTS "ND DEB INTENSITAT DES BEFALLS DURCH DEN KLEINEN ASPENBOCK SAPERDA POPULNEA L. [INTENSITY OF ATTACK BY S. POPULNEA IN RELATION TO POPLAR SPECIES AND HYBRIDS.] Commun. Inst. For. Csl. 2: 179-83. [G.]

Kurir, A. 1959. HOLZINSEKTEN-HOLZSCHUTZ. DER GROSSE PAPPELGLASFLUGLER (AEGERIA APIFORMIS) EIN PHYSIOLOGISCHER UND TECHNISCHER SCHADLING ALLER PAPPELARTEN. [Sesia APIFORMIS, A PEST OF ALL POPLARS AND POPLAR WOOD.] Allg. Holzrundschaue, Wien 15(305/306): 3 pp. [G.] Describes biology, hosts, injuries, etc., and discusses control. On park or roadside trees, the injection into flight holes of insecticides acting by inhalation is recommended.

Morani, V., and Arru, G. M. 1958. ACCUMULO DI GAS ENTRO PIOPI IN VEGETAZIONE. [GAS ACCUMULATION IN GROWING POPLARS.] Ricerca Scientifica, Roma 28(1): 146-51. 15 refs. [It.it.f.e.g.]

Negru, S. 1951. CROITORUL RAMURILOR DE PLOP. [THE POPLAR SHOOT BORER [SAPERDA POPULNEA].] Rev. Padurilor 66(6): 7-9. [Rum.rum.russ.] A short account of the life history, damage caused by, and control of this insect.

Pagony, H. 1955 and 1956. A NYARDUGVANOK ALGESZTESEDESE [I], II. [THE DEVELOPMENT OF FALSE HEART IN POPLAR CUTTINGS. I & II.] Erdomern. Foisk. Kozl., Sopron 1955: 111-29. 1956(1): 97-125. 19 refs. [Hu.hu.russ.g.]

1955. A NYARDUGVANYOK ALGESZTESEDESE III. [THE DEVELOPMENT OF FALSE HEART IN POPLAR CUTTINGS. III.] Erdomern. Foisk. Kozl., Sopron 1956(2):103-17. 6 refs. [Hu.hu.russ.e.]

1957. NYARFAALLOMANYOK EGESZSEGI ALLAPOTANAK VIZSGALATA, KULONOS TEKINTETTEL A Z ALGESZTESEDEARE. [THE HEALTH OF POPLAR STANDS IN RESPECT TO "RED HEART" INJURIES.] Erdomern. Foisk. Kozl., Sopron 1957(1): 51-63. 3 refs. [Hu.hu.russ.f.russ.f.]

1960. EGESZSEGES ALGESZT—BETEG ALGESZT? [FALSE HEART—SOUND OR DISEASED?] Erdo 9(11):409-13. 8 refs. [Hu.g.russ.]

Petrova, I. A. 1958. O FORMIROVANII I RAZMESCENII "CA" SAPERDA CARCHARIAS L. V SAVAL'SKOM LESNICESTVE. [THE FORMATION AND DISTRIBUTION OF FOC OF INFESTATION BY S. CARCHARIAS IN SAVALSK FOREST DISTRICT.] Trudy Vsesojuznogo Instituta Zashchity Rastenij, Leningrad No. 11: 74-84. 23 refs. [Russ.]

1960. O ROL SAPERDA CARCHARIAS L. V USYHANIITO-POLEVNIKOV SAVAL'SKOGO LESNICESTVA I PUTI ULUCSENIIJA SOSTOJANIJANASAZDENIJ. [THE ROLE OF S. CARCHARIAS IN THE DYING OF POPLAR STANDS IN THE SAVALA FOREST DISTRICT. AND WAYS OF IMPROVING STAND CONDITION.] Trudy Vsesojuznogo Instituta Zashchity Rastenij, Leningrad No. 14: 31-42. 23 refs. [Russ.]

Postner, M. 1962. DER HORNISSENGLASFLUGLER, AEGERIA APIFORMIS CLERCK (AEGERIIDAE, LEPIDOPTERA) AN JUNGPAPEL N IN PFLANZGARTEN- UND BAUMSCHULEN. [ATTACK OF A. APIFORMIS ON YOUNG POPLARS IN NURSERIES.] Anz. Schadlingsk. 35(6):81-6. 47 refs. [G.g.e.f.]

Regnicr, R. 1952. IMPORTANCE DES DEGATS DE LA MINEUSE DU CAMBIUM DU PEUPLIER POUR L'INDUSTRIE DU DEROUlage. [THE IMPORTANCE OF DAMAGE BY A CAMBIUM BORER IN POPLAR IN THE VENEER INDUSTRY.] Trans. 9th Int. Congr. Ent., Amsterdam 1951(1): 711-4. 7 refs. [F.e.]

Schneider, Z. 1959. Z BIOLOGII PRZEZIERNIKA OSOWCA (AEGERIA APIFORMIS CL.). [THE BIOLOGY OF A. [SESIA] APIFORMIS.] Prace Inst. Bad. Lesn. No. 190. 63-100. [Pol.russ.e.] Gives full details of the biology and some information on the few natural enemies and silvicultural significance of S. apiformis, the larvae of which feed between the cambium and sapwood of poplars.

Srot, M. 1961. [RESULTS OF CHEMICAL CONTROL OF SAPERDA CARCHARIAS.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 7(7):635-52. 38 refs. [Cz.cz.russ.e.]

Templado, J. 1960. [THE BIOLOGY OF SAPERDA POPULNEA.] Boletín de la Real Sociedad Espanola de Historia Natural, Madrid 58: 135-44. 24 refs. [Span.span.e.] Presents brief data on geographical distribution, life cycle in the Madrid area, damage caused and natural enemies.

Turcek, F. J. 1954. MECHANICKY SPOSOB NZIZOVANIA STAVU OSIKOVNIKADRENEHONATOPOLOCH. [MECHANICAL METHOD OF REDUCING POPLAR INFESTATION BY SAPERDA CARCHARIAS.] Les, Bratislava 1(11):19-21. 3 refs. [Slovak.]

Vasic, M. 1961. SASTOJINE STARIH TOPOLA I VRBA—ZARISTA OPASNIH PARAZITA. [STANDS OF OLD POPLARS AND WILLOW—FOCI OF DANGEROUS PARASITES.] Topola, Beograd 5(24):16-21. [Serb.f.]

Vujic, P., and Jodal, I. 1960. SUZBIJANJE MALOG TOPOLINOG STAKLOKRILCA PRIMENOM METODE UBRIZGAVANJA. [CONTROL OF SCIAPTERONTABANIFORME BY THE INJECTION METHOD.] Topola, Beograd No. 15: 21-4. [Serb.f.]

The insects, which cause serious damage to young poplars in nurseries and plantations, can be controlled by winter injection of CCl₄ or benzine into the openings of the galls formed on the stem by the larvae. Three types of syringe suitable for the purpose are illustrated.

Zivojinovic, S. 1954. MALA TOPOLINA STRIZIBUBA I TOPOLINI STAKLOKRILCI OZBILJNO UGROZAVAJU OPSTANAK KULTURA TOPOLA U VOJVODINI. [SAPERDA POPULNEA AND SESIIDAE PRESENT A SERIOUS MENACE TO THE EXISTENCE OF POPLAR STANDS IN THE VOJVODINA.] Sumarstvo 7(5): 273-7. [Serb.f.g.]

Describes the outbreaks in 1953 and 1954 of S. populnea and

Sciapterontabaniforme (and other Sesiidae) in two places in Vojvodina (500 and 150 ha., respectively).

1961. [BIOLOGY AND CONTROL OF SAPERDA POPULNEA IN YUGOSLAVIA.] Z. Angew. Ent. 48(4):410-22. 11 refs. [G.g.e.]

42 INJURIES FROM INORGANIC AGENCIES (EXCLUDING FIRE)

421.1

Forbes, R. S., and Davidson, A. G. 1962. EXAMINATION OF WIND-THROWN POPLAR TREES IN NEW BRUNSWICK. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. 18(6):2.

Two years after hurricane 'Donna,' most of the wind-thrown poplars (Populustremuloides, P. grandidentata, and 'Balsam' poplar) in pulpwood stands in Charlotte County, N. B., were still alive and apparently free from borer and fungus attack and could still be salvaged.

Joachim, H.-F., and Wachter, H. 1957. UBER STURM-UND WINDSCHADEN AN PAPPELN. [GALE AND WIND DAMAGE TO POPLARS.] Forst u. Jagd 7(10):468-70. 2 refs. [G.]

Mainly observations after severe gales in 1956 and 1957 in E. Germany. Most to suffer were trees on sites with high water-tables, older or densely planted stands, and trees on the east side of roads or watercourses. Populustrichocarpa had been thrown, and P. × robusta and P. × berolinensis broken, more easily than other poplars, but differences were small.

422.1

Eichbaum, K. 1956. UBER DIE FROST-RESISTENZ UNSER WIRTSCHAFTSPAPPELN. [FROST HARDINESS OF OUR COMMERCIAL POPLARS.] Allg. Forstzeitschr. 11(27-28): 354-5. [G.]

Discusses observations made after the hard winters of 1954-55 and 1955-56, including frost cracks, chiefly of Populus × robusta and discolorations of bark, stem, and pith, most severe on 2-year-old nursery stock. P. "deltoides missouriensis" and Italian cultivars suffered most. It was noted that plants which had been treated with B-containing fertilizer remained sound, while others from the same clones in similar sites, but untreated, were injured.

Morgeneyer, W. 1960. BEOBACHTUNGEN UBER FROSTSCHADEN UND CYTOSPORE-BEFALL IM PAPPELSORTENREGISTER IN GRAUPA NACH DER ANOMALEN WITTERUNG DER WINTER 1954/55 UND 1955/56. [FROST DAMAGE AND CYTOSPORE INFECTION IN THE POPLAR VARIETIES COLLECTION AT GRAUPA AFTER THE ABNORMAL WINTERS 1954.55 AND 1955-56.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 44 (Beitr. Pappelforsch. No. 4): 23-49. 13 refs. [G.g.russ.e.]

422.12

1960. UBER SPATFROSTSCHADEN IM PAPPELSORTENREGISTER GRAUPA IM FRUHLJAHRE 1959. [DAMAGE BY LATE FROST IN THE SPRING OF 1959 IN THE POPLAR VARIETIES COLLECTION AT GRAUPA.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 47 (Beitr. Pappelforsch. No. 5): 43-56. 9 refs. [G.g.russ.e.]

422.15

Stawecka, W. 1961. WPLYW PRZEMARZNIENIA PEDOW TOPOLOW YCH W MATECZNIKACH ZIMA 1955-56 NA ICH PRZYDATNOSC DO PRODUKCJI SADZONEK. [EFFECT OF FREEZING OF POPLAR SHOOTS IN STOOL-BEDS IN THE 1955-56 WINTER ON THEIR SUITABILITY FOR PRODUCTION OF CUTTINGS.] Prace Inst. Bad. Lesn. No. 217: 53-69. 14 refs. [Pol.russ.g.]

422.3

Zahariev, B. J. 1947/1948. VRAHNO PREGARJANE NA ZASADENI ZA VKORENJAVANE TOPOLOVI STABLOVI REZNICI. [TOP SCORCH OF ROOTED POPLAR CUTTINGS.] Godisn. Sofijsk. Univ. (Les. Fak.) 1: 347-60. 24 refs. [Bulg.f.f.]

A study of the phenomenon, caused by too much heat in the first summer. Shading or watering reduced this form of damage considerably.

424.2

Gunzl, L. 1953. FORSTKULTURSCHADEN DURCH EIS BEI HOCHWASSER. [INJURY TO FOREST PLANTATIONS BY ICE ON FLOODWATER.]

Allg. Forstztg. 64 (19.20) : 252-3. [G.]

Reports on the breaking and barking of all poplar saplings in a riverain forest conversion project in the March Valley by thick ice forming on water from a 2-m. flood-rise. This happened when the floods receded rapidly, cawing the ice to break up and move.

424.5

Vergnano, O. 1953. CARATTERISTICIEFFETTI DEL BOROSUPIANTE DI OLMO E PIOPO NELLA ZONA DEI SOFFIONI BORIFERI DI TRAVALE. [TYPICAL EFFECTS OF BORON ON ELMS AND POPLARS IN THE ZONE OF THE BORON-BEARING STEAM VENTS OF TRAVALE.] Nuovo G. Bot. Ital. (n.s.) 60(1/2) : 225-9. 5 refs. [It.e.]

The high B content of the soil in this area produces symptoms of injury in the leaves of poplars and elms but not of oaks. The symptoms are described and the B concentration of elms recorded -1,000 p.p.m. B_2O_3 in leaf dry matter.

424.7

Meiden, H. A. van der. 1962. KOPERGEBREK BIJ POPULIER. [COPPER DEFICIENCY IN POPLAR.] Ned. Boschb.-Tijdschr. 34(1) : 29-33. 1 ref. [Du.c.e.]

Describes the symptoms (observed first on 2-year *Populus X gelrica*) occurring if the Cu content of the leaves drops below 4 p.p.m. dry matter (optimum 7 or over). Application of P, especially in combination with N, tends to cause Cu deficiency. This was controlled by application of 500 kg. Cu slag/ha. or, until July, by spraying with Cu preparations.

44 DAMAGE BY HARMFUL PLANTS. VIRUS DISEASES

Anonymous. 1943. RESULTADOS DE LOS ESTUDIOS DE UNA ENFERMEDAD DE LOS ABAMOS EN LA PROVINCIA DE BUENOS AIRES. [RESULTS OF STUDIES ON A DISEASE OF POPLARS IN THE PROVINCE OF BUENOS AIRES.] Maderil 16(186) : 23 [Span.]

Benben, K. 1957. BADANIA NAD CHOROBIAMI TOPOL W POLSCE WYWOLANYMI PRZEZ CZYNNIKI ORGANICZNE. [STUDIES ON POPLAR DISEASES CAUSED BY ORGANIC AGENTS IN POLAND.] Roczn. Nauk Lesn. No. 19: 63-122. 61 refs. [Pol.russ.e.] (Prace Inst. Bad. Lesn. No. 170.)

Citerri, R. 1944. MALATTIE DEL PIOPE. [DISEASES OF POPLAR.] Bosco, Sept., p. 2. [It.]

Lansade, M. 1946. RECHERCHES SUR LE CHANCER DU PEUPLIER EN FRANCE. [RESEARCH ON POPLAR CANCER IN FRANCE.] Ann. Epiph., Paris 12(1) : 23-39. 28 refs. [F.]

Peace, T. R. 1939. THE RESISTANCE OF POPLARS TO CANCER AND OTHER DISEASES. NOTES ON THE SPECIES COMMONLY PLANTED IN GREAT BRITAIN. Inst. Leaf. Imp. For. Inst., Oxf. No. 1, 5 pp.

Riley, C. G. 1948. POPLAR DISEASE IN RELATION TO THINNING. For. Chron. 24(4) : 321.

44 45

Bazzigher, G., Fischer, F., and Martignoni, M. E. 1957. DEGATS CAUSES AUX PEUPLIERS PAR DES INSECTES ET "ES CHAMPIGNONS. [DAMAGE TO POPLARS BY INSECTS AND FUNGI.] Forêt, Neuchatel 10(6) : 130-40. [F.]

Dafauce, C. 1960. LAS PLAGAS DE LOS CHOPOS EN ESPAÑA. [PESTS AND DISEASES OF POPLAR IN SPAIN.] Bol. Serv. Plagas For., Madrid 3(5) : 47-95. 24 refs. [Span.]

Brief descriptions of (1) fungus diseases, and (2) sap-sucking, defoliating, bud-mining, and stem-boring insects, with recommendations for control.

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443 FUNGI AND BACTERIA

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[International: FAO/Int. Poplar Comm.] 1959. REPORT, 2ND SESSION, WORKING PARTY ON DISEASES. [Docum.] Int. Poplar Comm. 2nd Sess Wkg. Party on Diseases, Rome 1959 No. FAO/CIP/MAL/11, 6 pp. [E.] Summarizes statements on *diseases made in the* reports of National *Poplar Commissions. covering Dothichiza populea, Septoria populiperda, Cytospora chrysosperma, Melampsora rusts, "sweating" [bleeding] canker* [cf. F.A. 20, No. 734] and *Venturia tremulae*.

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Shear, C. L., and Davidson, R. W. 1940. A NEW SPECIES OF DOTHIORA ON ASPEN AND WILLOW. Mycologia 32: 105-11. Rev. Appl. Mycol. 19: 444. 1940.

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[Switzerland: Schweiz. Anst. Forstl. Versuchsw.] 1955. INSEKTEN UND PILZKRANKHEITEN DER PAPPELN. [INSECTS AND FUNGUS DISEASES OF POPLARS.] Kurzmitt. Schweiz. Anst. Forstl. Versuchsw. No. 4, 11 pp. [G.]

Contains a **classified list of 259** insect species occurring on poplars. Of the 26 species known to be injurious, the 8 most serious pests are discussed, with notes on control. Forty-two pathogens, mostly **fungi, are also** discussed with reference to the diseases **caused and (where possible) suggested control measures and the susceptibility of various poplar varieties.**

Taris, B. 1956. PREMIERE MISE AU POINT DES RECHERCHES ACCOMPLIES EN FRANCE SUR LES MALADIES CRYPTOGAMIQUES DU PEUPLIER. [A PRELIMINARY REPORT ON STUDIES OF POPLAR DISEASES IN FRANCE.] [Docum.] 12th Congr. Int. Union For. Res. Organ., Oxford 1956 No. IUFRO 56 24 102, 12 pp. [F.]

Includes notes on lay-out and technique of experimental study of *Dothichiza populea* and *Cytospora chrysosperma*, covering artificial inoculation, meteorological factors, **method of infection, resistant and susceptible strains of poplar, and work both in plantations and in the laboratory.**

Tartakowsky, S. G., and Arentsen, S. T. 1941. LA ROYA DEL ALAMO EN CHILE. [THE POPLAR RUST IN CHILE.] Bol. Sanid. Veg., Santiago 1(2): 21-32. [Span.] Biol. Abstr. 17: 22548. 1943. Rev. Appl. Mycol. 22: 229. 1943.

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Vloten, H. van. 1938. INVESTIGATIONS INTO THE SUSCEPTIBILITY OF POPLARS TO DOTHICIZA POPULEA SACC. ET BRIARD. Comm. Wageningen Inst. Pathology No. 80, 18 pp. Bblg. [Dut.]

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Tree-breeding for resistance to fungus attack is made **more difficult by the possibility of introducing new species of fungus from abroad and of the formation of new hybrids.** The appearance in laboratory experiments of several **physiologic races and a white variety of Melampsora larici-populina not present in previous years** is discussed.

Wallwitz, G. von. 1959. DIE PAPPELKRANKHEITEN, NACH DEN NEUESTEN UNTERLAGEN DER FAO "UND DER BUNDESREPUBLIK ZUSAMMENGESTELLT. [DISEASES OF POPLAR. COMPILED FROM THE LATEST FAO AND W. GERMAN SOURCES.] Allg. Forst- u. Jagdztg. 130(11/12): 281-4. 7 refs. [G.]

Waterman, A. M. 1946. CANKER OF HYBRID POPLAR CLONES IN THE UNITED STATES, CAUSED BY SEPTORIA MUSIVA. Phytopathology 36(2): 148-56. Bblg.

——— and Cash, E. K. 1950. LEAF BLOTCH OF POPLAR CAUSED BY A NEW SPECIES OF SEPTOTINIA. Mycologia 42(3): 374-94. 5 refs.

443.2

Chiba, O., and Kobayashi, T. 1957. [SOME OBSERVATIONS ON THE DISEASE OF POPLAR SEEDLINGS.] J. Jap. For. Soc. 39(2): 74-8. 12 refs. [Jap.]

Sections cover *Melampsora* (5 spp.) and *Sphaceloma* sp., *Phyllosticta populorum*, *Mycosphaerella togashiana* (*Cercospora populina*) and *Guignardia* sp.

Magnani, G. 1954. FUSARIUM SPP. ALCUNI CASI DI DEPERIMENTO DI PIOELLE IN VIVAIO. [SOME CASES OF DIE-BACK OF POPLAR IN THE NURSERY.] Cellulosa e Carta 5(12): 14-5. [It.f.e.]

Pesante, A. 1957. SECCUME DI PIOPI IN VIVAIO. [DIE-BACK OF POPLARS IN THE NURSERY.] Notiz. Malatt. Pianta (n.s.) No. 18:

65-6. [It.]

Describes a die-back of poplar occurring in nurseries near Turin at the end of September. No fungus infection was found, and inoculation with gram-negative bacteria isolated from affected plants failed to produce symptoms. It was noted that some plants that had been cut right back after hail damage in June, were unaffected.

Shea, K. R., and Kuntz, J. E. 1956. PREVENTION OF DAMPING-OFF OF POPLAR SEEDLINGS. For. Sci. 2(1): 54-7. 8 refs.

443.3

Fernandez Valiela, M. V. 1951. RESUMEN DE UN ESTUDIO SOBRE EL ESTADO SANITARIO DE LOS ALAMOS DEL DELTA. [THE STATE OF HEALTH OF POPLARS [AND WILLOWS] IN THE [PARANA] DELTA.] Idia 4(32/43): 1-3. [Span.]

Krstic, M., Marinkovic, P., and Smit, S. 1958. PRILOG POZNAVANJU MIKOFLORE NA TOPOLAMA U SRBIJI. [NOTES ON THE MYCOFLORA OF POPLARS IN SERBIA.] Topola, Beograd No. 6: 437-46. 4 refs. [Serb.f.]

Lists, with short morphological descriptions, 23 species of fungi isolated from leaves, bark, and wood of poplars during field studies in 1956-57; attention is drawn to the species causing most damage.

Vlasov, A. A., and Krangauz, P. A. 1956. GRIBNYE BOLEZNI, SPOSOBSTVUJUSCHIE OSLABLENIJU I USYHANIJU JASENJA I TOPLJA V STEPNYH NASAZDONIJAH. [FUNGUS DISEASES CAUSING WEAKENING AND DEATH OF ASH AND POPLAR IN STEPPE PLANTATIONS.] Sborn. Rabot Lesn. Hoz. Vsesojuz. Nauc.-Issled. Inst. Lesovod. No. 33: 91-111. [Russ.]

Gives detailed descriptions of stem and branch diseases, including Cytospora foetida sp. nov., a serious disease of poplar.

Zasev, B., and Canova, P. 1960. PRINOS KAM IZUCAVANETO NA GABNATA FLORA PO STABLOTO I KLONITE NA TOPOLITE V BULGARIJA. [THE FUNGAL FLORA OF POPLAR STEMS AND BRANCHES IN BULGARIA.] Nauc. Trud. Lesoteh. Inst., Sofija No. 8: 237-46. 21 refs. [Bulg.g.]

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[International: FAO/Int. Poplar Comm.] 1961. REPORT OF THE WORKING PARTY ON DISEASES, THIRD SESSION. VIENNA 1961. [Docum.] Int. Poplar Comm. 3rd Sess. Wkg. Party on Disease No. FAO/CIP/MAL/14, 22 pp. 10 refs. [E.] Includes, as annexes: **An application of the clinical approach for expressing the degree of tree vigor and vulnerability to disease (J. E. Bier) [by measuring bark turgor]; a report on a meeting on trunk scab disease at Stuttgart-Weilendorf, Aug. 6, 1961; and a virus disease of poplars (T. M. Berg) [in the Netherlands].**

45 DAMAGE BY ANIMALS

451 MAMMALS

Grechkin, V. P. 1950. MLEKOPITAYUSHCHIE VREDITELI LESNYKH KULTUR. [MAMMALS CAUSING INJURIES TO FOREST PLANTATIONS.] Lesn. Hoz. 1950(1): 54-7. [Russ.]

451.1

Kebbel, R. 1956. SCHUTZ JUNGER PAPPELN GEGEN WEIDEVIEH. [PROTECTION OF YOUNG POPLARS AGAINST CATTLE.] Holz-Zbl. 82 (38-39): 511. [G.]

451.2

Shadle, R. 1957. SIZES OF BEAVER CHIPS CUT FROM ASPEN. J. Mammal. 38(2): 268.

Maximum measurements from Populus tremuloides and P. grandidentata were: (1) wood chips, length 6-2/16, width 28/16 and thickness 9/16 in.; (2) bark chips, length 8-1/16, width 33/16, and thickness 8/16 in.

Vasic, M. 1959. OGLEDI HEMISKE ZASTITE KULTURA TOPOLE I VRBE OD STETNOG DELOVANJA VISOKE DIVLJACI. [EXPERIMENTS IN THE CHEMICAL PROTECTION OF POPLAR AND WILLOW PLANTATIONS AGAINST GAME DAMAGE.] Sum. List 83(8/9): 326-32. 5 refs. [Croat.g.]

Anthropin, HT, and HT, were applied to trees in young plantations in the Danube and Tisza basins. All three chemicals failed to prevent extensive deer damage.

453 INSECTS

Anonymous. 1947. TWO POPLAR APHIDS. Bull. Brooklyn Ent. Soc., Lancaster (n.s.) 42(2): 71.

Acatay, A. 1959. PAPPESCHADLINGE IN DERTURKEI. [PESTS OF POPLAR IN TURKEY.] Anz. Schadlingsk. 32(9): 129-34. 11 refs. [G.]

Presents brief notes on three species of *Acarina*, 15 *Coleoptera*, and 16 *Lepidoptera*, their habits, injury caused, and occurrence in Turkey.

———. 1959. MELANOPHILA DECASTIGMA (= PICTA PALL.) UND GYPSONOMA (= SEMASIA) DEALBANA FROEL (= INCARNANA HW.) IN DER TURKEI. [M. DECASTIGMA AND G. DEALBANA IN TURKEY.] Anz. Schadlingsk. 32(5): 65-8. 4 refs. [G.]

M. decastigma attacks 3- to 25-year poplar, and *G. dealbana* mainly young poplar plants. Observations are presented on the damage they inflict and on their life-history, and brief recommendations are made for their control.

Barbey, A. 1935. HOW TO CHECK THE EXTENSION OF DAMAGE TO POPLAR BY PESTS (MAINLY INSECT). Bull. Corn. For., Paris 23 (64/65): 473-9. [F.]

——— and Bovey, P. 1943. OBSERVATIONS SUR LA BIOLOGIE ET LES DEGATS D'UNE TORDEUSE DU PEUPLIER. [NOTES ON THE BIOLOGY AND DAMAGE OF A POPLAR TORTRICID (GYPSONOMA NEGLECTANA).] Bull. Soc. Vaud. Sci. Nat. 62(259): 221-8. Bblg. [F.]

Beffa, G. D. 1936. ON THE POPLAR WOOLLY APHID, PHLOEOMYZUS PASSERINII SIGN. Boll. Lab. Sper. R. Oss. Fitopat., Torino 13 (3/4): 17-23. Rev. Appl. Ent. 25(2): 100. 1937.

Bleton, C. A., and Fienzet, L. 1940. LES PARASITES DU PEUPLIER AU MAROC. II. SUR LA BIOLOGIE DE PARANTHRENE TABANIFORMIS, ROTT. "AR. INTERMEDIA LE CERF (LEPIDOPT. SESIIDAE). [PARASITES OF MOROCCAN POPLAR. II. ON THE BIOLOGY OF PARANTHRENE TABANIFORMIS ROTT. VAR. INTERMEDIA LE CERF (LEPIDOPT. SESIIDAE).] Bull. Soc. Sci. Nat. Maroc No. 20: 57-9. [F.] Biol. Abstr. 17: 10414. 1943.

Breny, R. 1950. PETITE SAPERDE (SAPERDA POPULNEAL.) ET BOUTURES DE PEUPLIER. [S. POPULNEA ON POPLAR CUTTINGS.] Bull. Inst. Agron. Gembloix 18(1/2): 33-8. 7 refs. [F.flem.g.e.]

Bytinski-Salz, H., and Neumark, S. 1955. [PLANT PROTECTION PROBLEMS IN FORESTRY AND AFFORESTATION.] La-Yaaran 5(3/4): 20.3, 29. 8 refs. [Heb.e.]

Lists the main insect-pests of pine, eucalypts, tamarisk, acacias, and poplars in Palestine. Control measures except to maintain the very existence of plantations are excluded as costing more than the value of a single year's increment.

Ceballos y Fernandez de Cordoba, G., and Dafaue Ruiz, C. 1960. PRINCIPALES PLAGAS DE LOS CHOPOS EN ESPANA. [PRINCIPAL PESTS OF POPLARS IN SPAIN.] Montes, Madrid 16(94): 327-42. [Span.]

Brief notes on the pests, the type of damage they inflict, and the best methods of control.

Charvat, K., and Capek, M. 1954. SKEDY SPOSOBENE CHROBAKMI NA TOPOL' OCH ZITNEHO OSTROVA. [DAMAGE BY LARVAE TO POPLARS ON ZITNY ISLAND.] Les, Bratislava 1(9): 20-8. 9 refs. [Slovak.]

Chrystal, R. N. 1919. THE POPLAR BORER, SAPERDA CALCARATA SAY. Agric. Gaz. Can. 6 333-6.

Dafaue, C. 1959. PLAGAS DE INSECTOS DEL CHOPYSUCOMBATE EN EL AÑO 1958. [INSECT PESTS OF POPLAR AND THEIR CONTROL IN 1958.] Bol. Serv. Plagas For., Madrid 2(4): 141-55. [Span.] A summary of the work achieved in Spain during the year.

———. 1962. [TREATMENT OF POPLAR PLANTING STOCK IN THE NURSERY AS A CONTRIBUTION TO THE PREVENTION OF PEST OUTBREAKS IN PLANTATIONS.] Bol. Serv. Plagas For., Madrid 5(9): 33-45. 32 refs. [Span.]

Daskalova, I. 1962. [THE DISTRIBUTION AND IMPORTANCE OF SOME POPLAR INSECT PESTS IN BULGARIA.] Nauc. Trud. Lesotekh. Inst., Sofia 10: 89-94. 11 refs. [Bulg.g.]

Presents notes on 42 species (5 *Homoptera*, 14 *Coleoptera*, 21 *Lepidoptera*, 2 *Hymenoptera*).

Daviault, L. 1941. LA CHRYSOMELE DU SAULE CALLIGRAPHA MULTIPUNCTATA "AR. BIGSBYANA KBY. [THE CHRYSOMELID BEETLE OF WILLOW, CALLIGRAPHA MULTIPUNCTATA VAR. BIGSBYANA KBY.] Nat. Canad. 68(3/4): 57-81, 89-112. Bblg. [F.] Rev. Appl. Ent. A29: 626.

Eliescu, G. 1937. LITHOCOLLETIS POPULIFOLIELLA TR. (DEFOLIATING POPLARS NEAR BUCHAREST). Rev. Padurilor 49(4): 397-401. [Rum.f.]

Fernandez de Cordoba, L.C., and Zarco, D. E. 1955. FAUNE ENTOMOLOGIQUE DU PEUPLIER. [INSECT FAUNA OF THE POPLAR.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 6, 10 pp. [F.]

Lists the species found on poplars in Spain.

Georgijevic, E., Fice, K., and Vclav, V. 1961. [INSECT PESTS ON SOFT-WOODED BROADLEAVED TREES IN BOSNIA AND HERCEGOVINA.] Rad. Sum. Fak. i Inst. Drvnu Industr., Sarajevo No. 6: 153-70. 12 refs. [Serb.g.]

Gives dates and places of identification of 63 species of insects on poplars and willows and notes severity of infestation. *Saperda populnea* and *Melasoma populi* were the most important pests.

Georgopoulos, A. 1956. PAPPESCHADLINGE IN GRIECHENLAND ZUGLEICH EIN BEITRAG ZUR BIOLOGIE "AN SCIAPTERON TABANIFORME UND MELANOPHILA DECASTIGMA. [PESTS OF POPLAR IN GREECE, WITH NOTES ON THE BIOLOGY OF S. TABANIFORME AND M. DECASTIGMA.] Anz. Schadlingsk. 29(8): 127-31. 16 refs. [G.]

An annotated list of pests, with fuller notes on *S. tabaniforme* and *M. decastigma* and their control.

Hochmut, R. 1962. MSICE SKODICI NA TOPOLECH A BOJ PROTI NIM. [POPLAR APHIDS AND THEIR CONTROL.] Lesn. Cas. 8(2): 115-36. 21 refs. [Cz.russ.g.]

Horiuchi, R. 1940. [OBSERVATIONS ON GYPSONOMA MINUTANA HUBNER (EUCOSMIDAE).] Nojikairyoshiryo Minist. Agric., Japan No. 152: 86-8. [Jap.] Rev. Appl. Ent. A30: 13.

Jodal, I. 1962. [ATTACK ON POPLARS BY BUPRESTID PESTS.] Topola, Beograd 6(29/30): 43-5. 3 refs. [Serb.]

Gives interim results of observations on *Agrilus* and *Buprestis*, covering damage, and counter-measures.

———. 1962. [PLANNING PROTECTION AGAINST INSECT PESTS ON POPLARS.] Topola, Beograd 6(29/30): 36-9. [Serb.f.]

Makes recommendations on the number and timing of spraying operations to control insects in nurseries and young and older plantations.

Kailidis, D. S. 1961. PARATERESEIS EPI TON SCIAPTERON TABANIFORMIS ROTT. KAI SEMASIA SPP., DYDIOPIKINDYNON ECHTHRON TES LEUKES EN HELLADI. [OBSERVATIONS ON S. TABANIFORME ROTT. AND SEMASIA SPP., TWO DANGEROUS ENEMIES OF POPLAR IN GREECE.] Das. Chron. 3(12): 490-9. 23 refs. [Gk.e.]

Kovacevic, Z. 1957. DIE PROBLEME DES FORSTSCHUTZES IN JUGOSLAWIEN—UBERSICHT DES WICHTIGSTEN FORSTSCHADLINGE. [THE PROBLEM OF FOREST PROTECTION IN YUGOSLAVIA—REVIEW OF THE MOST IMPORTANT FOREST PESTS.] Anz. Schadlingsk. 30(5): 65-9. [G.]

An enumeration of species with brief notes, and an appendix listing all insects observed hitherto on poplar in Yugoslavia.

Laszlo, T. 1939. UBER DIE BIOLOGIE DER BLATTLAUS PEMPHIGUS SPIROTHECAE PASS. [ON THE BIOLOGY OF THE APHID P. SPIROTHECAE.] Z. Angew. Ent. 26(2): 297-311. Bblg. [G.g.]

MacDougall. 1912. WILLOW AND POPLAR LEAF BEETLES. Extr. J. Bd. Agric., Oct., pp. 555-60.

Maheux, G. 1940. LE LIPARIS DU SAULE (STILPNOTIA SALICIS L.) DANS QUEBEC. [THE WILLOW LIPARID MOTH (STILPNOTIA SALICIS L.) IN QUEBEC.] Nat. Canad. 67(2/3): 73-8. Bblg. [F.] Rev. Appl. Ent. A29: 626.

Miklos, I. 1960. PRILOG POZNAVANJU STETNIH INSEKATA NA TOPOLAMA UN.R. HRVATSKOJ. [INSECT PESTS OF POPLAR IN CROATIA.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 2: 55-67. 19 refs. [Serb.g.]

Lists some 69 insects found on poplar in studies in 1956-57. Besides known pests, a number of insects rarely found on poplar were noted, including *Ceresa bubalus*, *Mamestra persicariae*, and *Cimex femorata*.

Morris, R. C. 1960. CONTROL OF COTTONWOOD INSECTS WITH A SYSTEMIC INSECTICIDE. J. For. 58(9): 718.

[Netherlands: Itbon] 1962. POPULIERENINSEKTEN. [POPLAR INSECTS.] Meded. Inst. Toegep. Biol. Onderz. Nat. No. 57: 42-4, 49. [Du.e.]

Discusses damage by *Cryptorrhynchus lapathi*, *Stilpnotiasalicis*, and *Phloeomyzus redelei*.

Nishiguchi, C. 1963. [PESTS OF POPLAR IN JAPAN.] Anz. Schädlingssk. 36(6): 85-8. [G.]

Nogueira, C. D. S. 1957. ALGUNS INSECTOS DA BIOCENOSE DOS CHOPOS EM PORTUGAL. [SOME INSECTS OF THE POPLAR BIOCOENOSIS IN PORTUGAL.] Publ. Serv. Flor. Aquic. Portugal 24(1): 41-1'77. 99 refs. [Port.port.e.]

Patocka, J. 1955. POZNAMKY O SKODCOCH NA TOPOL' OCHR. 1953. [NOTES ON POPLAR PESTS, 1953.] Lesn. Sborn. Slov. Akad. Vied No. 1: 45-69. 13 refs. [Slovak.slovak.russ.g.]

Discusses larvae of several species of insect found damaging leaves, and gives a morphological key to the adult larvae of the genus *Pygaera*.

Rafes, P. M. 1960. NASEKOMYE-VREDITELI TOPOLEJ, "SIN I IV, PROIZRASTAJUSCHIH NA NARYNSKIH PESKAH POLUPUSTYNNOGO ZAVOLZJA. [INSECT PESTS OF POPLARS, ASPENS AND WILLOWS GROWING ON THE NARYN SANDS IN THE TRANS-VOLGA SEMI-DESERT.] Trud. Inst. Les. No. 48: 102-28. 51 refs. [Russ.]

Regnicr, R. 1969. POPLAR INSECT PESTS. SURVEY NO. 4, CRYPTORRHYNCHUS LAPATHI. SURVEY NO. 5, SCIAPTERON TABANIFORME SURVEY NO. 6, CAPNODIS. [Docum.] Int. Poplar Comm. Wkg. Party on Insects Nos. J 6838; J 6838a; J 6838b. 2 pp. each. [E.] Three questionnaires, each preceded by brief notes.

Rohrig, E. 1955. UBERSICHT UBER DIE BISHER BEOBSACHTETEN INSEKTEN AN DER PAPPEL. [REVIEW OF INSECTS FOUND ON POPLAR.] Anz. Schädlingssk. 28(3): 33-40. [G.]

The review is based on literature and is presented in the form of a table showing species, date, and locality of discovery, and by whom discovered.

Romanyk, N. 1958. LA SITUACION DE PLAGAS DE INSECTOS FORESTALES EN ESPANA EN 1958. [THE SITUATION WITH REGARD TO FOREST INSECT PESTS IN SPAIN, 1958.] Bol. Serv. Plagas For., Madrid 1(2): 89-93. [Span.]

A short review of the situation including lists of species attacking poplar and pine.

Silver, W. H. 1942. THE FUNGUS FLORA OF AN INSECT GALL. Abstr. in Proc. Ind. Acad. Sci. 1941(51): 75.

Soules, B. 1961. KATAPOLEMESIS ASTHENEION LEUKES. [CONTROL OF POPLAR PESTS.] Das. Chron. 3(2): 104-7. [Gk.]

The author presents a table to assist poplar cultivators in Greece, and particularly Macedonia, to identify the various insect pests (26 are listed) and control their attacks.

Stefanov, D., and Daskalova, I. 1962. [SOME UNSTUDIED AND NEW INSECT PESTS OF POPLARS IN BULGARIA.] Nauc. Trud. Lesoteh. Inst., Sofia 10: 73-7. 8 refs. [Bulg.g.]

Discusses 8 species of Lepidoptera, 8 Coleoptera, and 2 Coccidae.

[Switzerland: Schweiz. Anst. Forstl. Versuchsw.] 1955. INSEKTEN UND PILZKRANKHEITEN DER PAPPELN. [INSECTS AND FUNGUS

DISEASES OF POPLARS.] Kurzmitt. Schweiz. Anst. Forstl. Versuchsw. No. 4, 11 pp. [G.]

Contains a classified list of 259 insect species occurring on poplars. Of the 26 species known to be injurious, the eight most serious pests are discussed, with notes on control. Forty-two pathogens, mostly fungi, are also discussed with reference to the diseases caused and (where possible) suggested control measures and the susceptibility of various poplar varieties.

Vivani, W. 1955. "CCORRE PROTEGGERE FIN DALL'INIZIO I NUOVI PIOPPETI VENETI DAGLI INSETTI XILOFAGI. [THE PROTECTION OF YOUNG VENETIAN POPLAR PLANTATIONS FROM WOOD-EATING INSECTS.] Cellulosa e Carta 6(7): 7-10. [It.]

Summarizes current methods of controlling *Cossus cossus*, *Saperda* spp., and *Cryptorrhynchus lapathi* on young poplars.

Wettstein, O. 1959. ZUR BIOLOGIE "ON PAPPELSCHADLINGEN IN WINDSCHUTZSTREIFEN. [THE BIOLOGY OF POPLAR PESTS IN SHELTERBELTS.] Cbl. Ges. Forstw. 76(2): 84-106. 9 refs. [G.]

Zarco, E., and Ceballos, G. 1956. INSECTOS PERJUDICIALES AL CHOPO EN ESPANA. [INSECTS DAMAGING POPLAR IN SPAIN.] Servicio de Plagas Forestales, Direccion General de Montes, Cazay Pesca Fluvial, Ministerio de Agricultura, Madrid. 125 pp. [Span.] Illustrated descriptions with notes on the life history of a large number of Coleoptera and Lepidoptera and also a few Hemiptera and Diptera.

Zivojinovic, S. 1957. NAJZNACAJNIJI STETNI INSEKTI MEKIH LISCARA U TOKU 1956 "DINE. [THE MOST IMPORTANT INSECT PESTS OF POPLAR AND WILLOW IN 1956.] Topola, Beograd 1(2): 81-92. 4 refs. [Serb.serb.f.]

Lists 14 species of insect pests occurring in dense populations in Serbia in 1956 and causing damage to poplar and willow plantations. Species belong mainly to the Coleoptera and Lepidoptera, with one species each from the Homoptera, Hymenoptera and Acari. Some notes are given on the extent of the damage, and the biology of the insects.

——— and Tomic, D. 1956. STETNI INSEKTI MEKIH LISCARA. (PRVI PRILOG.) [INSECT PESTS OF WILLOWS AND POPLARS. (FIRST CONTRIBUTION.)] Suppl. to Zast. Bilja No. 34, 22 pp. 24 refs. [Serb.serb.e.]

Lists 69 species of various orders found in 1953-55 along the rivers Danube and Tisa, with notes on type and extent of damage by the more important of them.

459 OTHER ANIMALS

Jodal, I. 1962. [SOME EXPERIMENTS IN THE CONTROL OF TETRANYCHIDS ON POPLARS.] Topola, Beograd 6(28): 88-90. 4 refs. [Serb.f.]

Mass outbreaks of a so-far unidentified tetranychid mite have occurred during recent years in poplar nurseries in Vojvodina. They have been successfully controlled by spraying with 0.15% diazinon.

48 INJURIES DUE TO UNKNOWN OR COMPLEX CAUSES

Moriondo, F. 1955. ALTERAZIONI SU PIANTE DI PIOPPO IN SEGUITO A CRISI DI ATTECCIMENTO. [A DIE-BACK OF POPLARS FOLLOWING TRANSPLANTATION SHOCK.] Ann. Accad. Ital. Sci. For. 4: 345-86. 22 refs. [It.f.]

A detailed study, illustrated by 30 photomicrographs, of a disorder occurring in hybrid poplars transplanted when 4 m. high. In the following spring they developed stem cankers caused by a fungus of the Sphaeropsidales, and in the following autumn extensive top-dying above hypertrophy of the bark in the neighborhood of epicormic shoots. This disorder is ascribed to inadequate root development due to transplantation shock. Anatomical changes in the affected parts are described in detail.

5 FOREST MENSURATION

52 MEASUREMENTS OF THE STEM DIMENSIONS AND VOLUME OF TREES, STANDS, FORESTS, AND TIMBER

52/56

[Germany : Dtsch. Akad. Landw. Wiss.] 1960. FRAGEN DER ERTRAGSKUNDE UND DER HOLZMESSKUNDE BEI DER ARBEIT MIT FORSTLICHEN VERSUCHSFLACHEN. [YIELD AND MENSURATION STUDIES BASED ON FOREST SAMPLE PLOTS.] Tagungsbericht, Dtsch. Akad. Landw. Wiss., Berlin No. 26, 175 pp. 15 refs. [G.g.russ.e.]

524 DETERMINATION OF THE VOLUME OF TREES AND STANDS

[Germany: Forst- u. Holzw.] 1962. SONDERHEFT PAPPEL. [SPECIAL NUMBER: POPLARS.] Forst- u. Holzw. 17(12): 225-44. 28 refs. [G.]

524.12

Bryndum, H. 1957. FORMTAL FOR POPPEL. [FORM FACTORS FOR POPLAR.] Dansk Skovforen. Tidsskr. 42(3): 193-6. [Dan.] (Kort Meddelelse fra Statens Forstlige Forsogsvaesen No. 25.)

Form factors for total volume and for merchantable volume for different diameters and heights are shown in graphs. Because of the smallness and heterogeneous nature of the material (6 species and hybrids were included) the results can only be indicated.

524.3

Sopp, L. 1957. HAZAI NYARASAINK FATOMEG- ES TORZALAK-VIZSGALATANAK EREDMENYEI. [RESULTS OF INVESTIGATIONS ON THE VOLUME AND STEM FORM OF HUNGARIAN POPLAR STANDS.] Erdo 6(11): 429-38. [Hu.]

From abstr. in Hung. Agric. Rev. 7(2): 9. 1958. [E.]

524.315

Kubita, S., and Roupec, J. 1956. ZJIST'OVANI HMOTY TOPOLU NA STOJATE. [ASSESSMENT OF THE VOLUME OF STANDING POPLAR TREES.] Lesn. Prace 35(1): 21-7. [Cz.]

sopp, L. 1957. A HAZAI NYARAK FATOMEGE. [VOLUME TABLES FOR POPLARS IN HUNGARY.] Erdesz. Kutatas., Budapest 1957(3/4): 15-72. 13 refs. [Hu.russ.g.e.]

Volumes tables were constructed for (a) *Populus canescens* and *P. alba*, and (b) *P. nigra*, based on 2,683 trees of (a) and 835 of (b).

54 ASSESSMENT OF SITE QUALITY

541 BASED ON HEIGHT, DIAMETER, VOLUME, ETC.

Keresztesi, B. 1960. NEHANY ADATNYARASAINKROL. [SOME DATA ON OUR POPLAR STANDS.] Erdo 9(5): 171-4. [Hu.russ.g.]

The county working-plan statistics and Magyar's poplar yield table (compiled for local conditions), show that $\frac{1}{4}$, $> \frac{1}{2}$, and almost $\frac{1}{4}$ of Hungary's indigenous poplar stands are respectively good, moderate, and poor. Of the exotic species the proportions are $> \frac{1}{2}$, almost 1.6 and 1/3. The good-quality stands of both categories are on the flood-plains, the moderate quality of indigenous poplars in the sand regions between Danube and Tisza, while poor qualities are generally in the hills and mountains.

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Anonymous. 1918. GROWTH OF POPLARS. Quart. J. For. 12: 132.

Ahmad, G. 1962. POPLARS IN WEST PAKISTAN. Pakistan J. For. 12(1): 80-3.

Gives some growth data for native and introduced poplars, including the indigenous *Populus ciliata*, *P. alba*, *P. nigra*, and *P. euphratica*, and the introduced *P. x euramericana 'eugenii'*, 'canadense', 'l-21 4', 'I-154', and *P. wislizenii*.

Bergogne, L., and Parde, J. 1963. [THE PRODUCTIVITY OF THE POPLAR PLANTATIONS OF THE GARONNE VALLEY.] Rev. For. Franc. 14(4): 261-79. [F.]

Gives data in increment and yield for a number of varieties and clones, and soil analyses for some sample plots.

Korsun, F. 1954. TAXATEUR SUR LA CULTURE DES PEUPLIERS. [A MENSURATION OFFICER ON POPLAR-GROWING.] FAO typescript translation, [n.d.] 5 pp. [F.]

Transl. from Les, Bratislava 1954(12): 12-5. Presents a table of stocking showing number and volume of trees removed in thinning, reserve volume at 30 years, total production and m.a.i. over 30 years, based on 258 sample plots from different parts and representing the main poplar species grown in Czechoslovakia, and five site classes.

Piccarolo, G. 1950. QUALCHE DATO SULLA PRODUZIONE LEGNOSA CORMOMETRICA DI FUSTAIE COETANEE DI PIOPPI, CRESCIUTE NEI TERRENI GIGOLENALI DEL CASEALE (PROV. DI ALESSANDRIA). [SOME MENSURATIONAL DATA ON THE GROWTH AND YIELD OF EVEN-AGED STANDS OF POPLAR IN THE FLOODLANDS OF CASEALE (ALEXANDRIA PROVINCE).] Monti e Boschi No. 6: 266-8. [It.]

Pratt, E. R. 1918. THE INITIAL GROWTH OF VARIOUS POPLARS. Quart. J. For. 12: 132-5.

Schletter, A. 1954. BETRACHTUNGEN ZUR WECKSCHEN METHODE DER WACHSTUMSDIAGNOSE. [WECK'S METHOD OF GROWTH ANALYSIS.] Arch. Forstw. 3(3/4): 193-205. 8 refs. [G.]

Susmel, L. 1953. CAPACITA' PRODUTTIVA DELLE SPECIE LEGNOSE. [THE PRODUCTIVE CAPACITY OF WOODY SPECIES.] Monti e Boschi 4(2): 51-8. 14 refs. [It.f.e.]

Compares the yield of three typical, pure, even-aged stands of spruce, poplar, and eucalypt (*E. rostrata*) having respective rotations of 150, 15, and 12 years. M.a.i. in volume is in the ratio 1:2.9:3.6, but increment in drywood weight is in the ratio 1:2.8:5.

Trifunovic, D., and Popovic, C. 1960. PROIZVODNOSPOSOBNOST SASTOJINA NAJRASIRENIJIH VRSTA TOPOLA U AP VOJVODINI. [THE PRODUCTIVE CAPACITY OF STANDS OF THE MOST WIDELY USED POPLAR SPECIES IN VOJVODINA.] Sumarstvo 13(7/8): 359-73. 19 refs. [Serb.f.f.]

Presents data on c.a.i./ha. for *Populus robusta*, *P. serotina*, *P. nigra*, and *P. alba* plantations calculated from 320 sample stems cut on 22 plots in the Danube, Sava, and Tisa River areas. Regression equations derived from these data are given for height, b.a., and volume increment. An equation is also given for bark thickness.

561.21

Herbignat, A. 1952. ACROISSEMENTS ANNUELS MOYENS DE QUELQUES TYPES DE PEUPLIER EN BELGIQUE. [MEAN ANNUAL [GIRTH] INCREMENT OF SOME POPLARS IN BELGIUM.] Bull. Soc. For. Belg. 59(7): 335-7. [F.]

Gives preliminary data for several clones of *Populus serotina*, *P. deltoides* f. *virginiana*, *P. robusta*, *P. regenerata*, and *P. marilandica*.

Nitu, G. 1962. [DIAMETER INCREMENT OF POPLAR STANDS DURING THE GROWING SEASON.] Rev. Padurilor 77(11): 658-61. 4 refs. [Rum.]

Poskin, A. 1955. ACCROISSEMENTS ANNUELS EN CIRCONFERENCE DE PEUPLIERS DE CULTURE EN BELGIQUE. [ANNUAL GIRTH INCREMENT OF POPLARS GROWN IN BELGIUM.] Spec. Pap. 8th Sess. Int. Poplar Comm., Madrid 1954 No. FAO/CIP/75-D Add. 1: 93-6. [F.]

Tabulates girth increment data for 15 years, for *Populus virginiana*, *P. robusta*, *P. regenerata*, *P. serotina*, and *P. marilandica*. [Cf. Herbignat, above.]

562.2

Darbellay, 1914. ON THE VOLUME YIELD OF THE ITALIAN POPLAR. J. For. Suisse 65: 114-9.

566 YIELD TABLES AND THEIR CONSTRUCTION

Christie, J. M. 1959. PRELIMINARY YIELD TABLE FOR POPLAR. For. Rec. For. Comm., Lond. No. 40, 14 pp. 2 refs.

Dawany. 1867. NOTES ON THE YIELD OF POPLAR. Monatschr. F. & J. 9: 197-8.

Hoffmann, A. 1937. THE YIELD OF POPLAR IN NORTHERN ITALY. L'Alpe 24(7): 261-67.

Schmitz-Lenders, B. 1948. PAPPEL-ERTRAGS- UND MASSEN-TAFELN. [YIELD AND VOLUME TABLES FOR POPLAR.] Verlag von M. & H. Schaper, Hannover. 29 pp. [G.]

6 FOREST MANAGEMENT

De Lotbiniere, H. G. J. 1948. POPLAR FOR QUICK RETURNS. Quart. J. For. 42(1): 27-31.

Discusses possibilities of *commercial growing of poplar in Britain*.

[Italy: Ente Naz. Cellulosa] 1954. ATTI DEL CONGRESSO NAZIONALE DEL PIOppo (ROVIGO 15 NOVEMBRE 1953). [PROCEEDINGS OF THE (ITALIAN) NATIONAL POPLAR CONFERENCE (ROVIGO 15 NOV. 1953).] Pubbl. Ente Naz. Cellulosa Carta, Roma 1954. 257 pp. [It.]

The papers and discussions deal mainly with the economic *aspects of poplar growing in Italy*. An exception *is a paper* by D. Rui, G. Giraldo, and F. Bellavito on poplar *pests* in *Veneto*, dealing with outbreaks of (1) *Phloeomyzus passerinii*, and (2) *Dothichiza populea*.

Koltay, G. 1949. A NYARFA ERDOGAZDASAGI JELENTOSEGE. [THE SIGNIFICANCE OF POPLARS IN FORESTRY.] Erdesz. Lap. 85(8): 172-7. [Hu.russ.f.e.g.]

Razzetti. 1929. POPLAR PRODUCTION IN THE "ALLEY OF THE PO. L'Alpe 16: 249-54.

1929. POPLAR PRODUCTION IN THE "ALLEY OF THE PO. L'Alpe 16: 393-9.

613 EXPLOITABILITY AND ROTATION

Allegri, E. 1955. DETERMINATION DE L'EPOQUE D'ABATTAGE DES PEUPLIERS EN FONCTION DE LA FORME DU FUT. [DETERMINATION OF EXPLOITABLE AGE OF POPLARS AS A FUNCTION OF STEM FORM.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/79-F, 3 pp. [F.]

Discusses the *factors* involved, in general terms.

Giordano, G. 1959. DE LA DETERMINATION EXACTE DE LA ROTATION DE PRODUCTION MAXIMUM DES PLANTATIONS DE PEUPLIER. [THE EXACT DETERMINATION OF THE ROTATION OF MAXIMUM VOLUME PRODUCTION IN POPLAR PLANTATIONS.] [Docum.] 10th Sess. Int. Poplar Comm., Italy 1959 No. FAO/CIP/95-F Add. 1, 5 pp. [F.]

1959(1960). STUDIO ANALITICO DEL TURNODI MASSIMA PRODUZIONE LEGNOSA APPLICATO A I PIOPPETI DI IMPIANTO ARTIFICIALE. [ANALYTICAL STUDY OF THE ROTATION OF MAXIMUM VOLUME PRODUCTION IN POPLAR PLANTATIONS.] Pubbl. Cent. Sper. Agric. For., Roma No. 3: 181-91. [It.it.e.e.]

Gonet, B. 1952. ZAGADNIENIE WIEKU REBNOSCI W UPRAWACH TOPOLOWYCH DLA PRODUKCJI DREWNA CELULOZOWEGO. [THE PROBLEM OF FELLING AGE IN POPLAR PULPWOOD PLANTATIONS.] Sylwan 96(4): 387-433. 29 refs. [Pol.pol.russ.e.]

651 CALCULATION OF COSTS AND PROFITABILITY

Bornand, G. -H. 1956. LA RENTABILITE DU PEUPLIER. [THE FINANCIAL YIELD OF POPLARS.] Schweiz. Z. Forstw. 107(8/9): 458-66. [F.g.]

An analysis of quantities *cut, assortments* obtained and prices realized *from poplars grown* in a mixed bottom-land forest bordering Lake *Murten (Neuchatel)*, over a number of years, *and* recommendations *for* making poplar-growing more profitable.

651.6

[Netherlands: Landbouw-Economisch Instituut] 1951. KOSTPRIJSBEREKENING VOOR HOUT VAN GROVEDEN, DOUGLAS, POPULIER, EN INLANDSE EIK. [CALCULATING THE COST PRICE OF TIMBER OF SCOTS PINE, DOUGLAS FIR, POPLAR, AND NATIVE OAK.] Rapport, Landbouw-Economisch Instituut, Den Haag No. 144, 47 pp. [Du.]

1952. HERBEREKENINGEN. "AN DE KOSTPRIJZEN VOOR HOUT "AN GROVEDEN, DOUGLAS POPULIER EN INLANDSE EIK (RAPPORT NR. 144) IN VERBAND MET DE GEWIJZIGDE LOONKOSTEN. [A FRESH CALCULATION OF COST PRICE OF TIMBER OF SCOTS PINE, DOUGLAS FIR, POPLAR, AND NATIVE OAK (REPORT NO. 144) IN CONNECTION WITH THE REVISED WAGE SCALES.] Nota, Landbouw-Economisch Instituut, Den Haag No. 98, 21 pp. [Du.]

651.71

Madas, A. 1961. A NYARFATERMESZTES GAZDASAGOSAGA. [THE PROFITABILITY OF POPLAR CULTURE.] Erdo 10(5): 174-80. [Hu.g.russ.]

A thorough *logging* study with calculations based on yield tables *shows* that poplar raising on *the best* sites is, even by industrial standards, a *very* profitable investment. Its importance in soil utilization is also illustrated. Dollar *and forint* data are *tabulated*.

Schutze, G. [1959?] ZIELE UND GRENZEN DES PAPPELANBAUES IN WESTDEUTSCHLAND. [TARGETS AND LIMITS OF POPLAR CROWING IN WEST GERMANY.] Deutscher Pappelverein und Lignikultur, Bonn. 52 pp. 42 refs. [G.g.]

Examines supply of and demand for wood in W. Germany and Europe, and for poplar wood in W. Germany. Concludes that within this century demand is likely to exceed supply, and that *the only limitation to poplar growing is* the availability of suitable sites. [Cf. Volkmann, 1958, P. *robusta* to P. *sukashewi*, 566, *and* Stegmann, 1959, *Populus sp.*, 2.]

653 VALUE INCREMENT OF THE STEM; DEVELOPMENT AND STRUCTURE OF THE STAND AS REGARDS VALUE

Darbellay. 1914. FINANCIAL YIELD OF ITALIAN POPLAR. J. For. Suisse 20: 50-4.

7 MARKETING OF FOREST PRODUCTS.
ECONOMICS OF FOREST TRANSPORT AND THE WOOD INDUSTRIES

73 PRICES

Anonymous. 1931. NEED FOR MORE POPLAR TIMBER. Dtsch Forstw. 13: 771.

8 FOREST PRODUCTS AND THEIR UTILIZATION

[International: FAO Near East Poplar Conf.] 1954. LOGGING AND UTILIZATION OF POPLAR WOOD. NOTE OF THE SECRETARIAT. [Paper] Near East Poplar Conf. 1954, FAO, Rome. No. FAO/NEPC/7, 14 pp. [E.]

Suggests possible uses **and** recommends desirable lines of research. **Forms** for recording measurements of **sample trees and** tests on wood samples are annexed.

Kanzler. 1953. VERWERTUNGSMÖGLICHKEITEN "ON PAPPELHOLZ. [POSSIBILITIES OF USE OF POPLAR WOOD.] Holz-Zbl. 79(57): 641-2. [G.g.]

Najera y Angulo, F. 1960. APLICACIONES INDUSTRIALES DE LA MADERA DE CHOPO: ESTUDIO TECNICO Y ECONOMICO. [INDUSTRIAL USES OF POPLAR WOOD: TECHNICAL AND ECONOMIC STUDY.] In Conferencias sobre el chopo y sus aplicaciones, Sección de Publicaciones de la Escuela Técnica Superior de Ingenieros de Montes, Madrid. Pp. 67-97. [Span.]

Reviews (1) **the** properties and characteristics of poplar wood, (2) its industrial uses, **and** (3) its management in various **parts of** the world.

1962. LAS MADERAS DE CRECIMIENTO RAPIDO Y LA EXPANSION INDUSTRIAL DE ESPANA. [FAST-GROWING TIMBERS AND INDUSTRIAL EXPANSION IN SPAIN.] Inst. For. Invest. Exp. Madrid. 72 pp. 4 pp. of refs. [Span.]

Reviews briefly **the Spanish** situation **with reference to the** production and consumption of wood, **states the need for** establishing quick-growing species, **and** summarizes information on the properties **and uses of** poplar, and on its management.

Van Tilt. 1929. NOTE ON COMMERCIAL USES OF POPLAR IN BELGIUM. Bull. Soc. For. Belg. 32: 410.

81 WOOD AND BARK: STRUCTURE AND PROPERTIES

[International: FAO Conf. Mech. Wood Technol.] [1952.] REPORT OF SECOND CONFERENCE ON MECHANICAL WOOD TECHNOLOGY, 6-18 AUGUST 1951. Iglis, Austria. FAO, Rome No. FAO/52/5/2789, 71 pp.

Reports include: (1) recommended methods of test for evaluating **the** properties of fibre building boards; (2) proposed standard procedure for **the** mechanical testing of veneer, **plywood, and** allied materials; (3) progress reports on timber tests; (4) **stress-grading of** structural timber; and (5) nomenclature of commercial timbers; **with an** appendix: Mechanical **and** industrial testing of poplar **wood**, by G. Giordano.

Kubinsky, E. 1955. PRIEMYSELNA SPRACOVATEL'NOST' TOPOL'OV AZ TOHO VYPLYVAJUJE POZNATKY PRE ICH PESTOVANIE. [INDUSTRIAL UTILIZATION OF POPLARS AND ITS EFFECT ON SILVICULTURAL PRACTICE.] Les, Bratislava 2(1,2,3): 24-S; 86-93. [Slovak.]

Launprecht. 1870. BRANCH WOOD OF POPLAR AND BIRCH. Allg. Forst- u. Jagdztg. 46: 449-51.

810 GENERAL INFORMATION ON WOOD

Anonymous. 1941. PAPPEL. [POPLAR] Holz 4: 231. 9 refs. [G.]

1941. SPECIMEN WOODS NO. 65: POPLAR (POPULUS SPP.). Wood 6(4): 95-96.

Betts, H. S. 1945. AMERICAN WOODS: COTTONWOOD. U. S. For. Serv. 8 pp.

Clonaru, A., Ocskay-Clonaru, S., and Bindiu, C. 1961. INSUSIRI TEHNOLOGICE ALE LEMNULUI SI CELULOZEI PLOPILOR DIN R.P.R. [TECHNICAL PROPERTIES OF WOOD AND PULP FROM POPLARS GROWN IN RUMANIA.] Rev. Padurilor 76(8): 490.6. 7 refs. [Rum.russ. g.f.e.]

Cox, H. A. 1942. HOME-GROWN POPLAR. Wood 6(7): 117.

Gonet. 1927. QUALITIES AND USES OF POPLAR. J. For. Suisse 78: 217.

Henderson, F. Y. 1950. HOME-GROWN POPLAR. J. Land Agents' Soc. 49(2): 47-8.

Irwin, J. D., and Doyle, J. A. 1961. PROPERTIES AND UTILIZATION OF CANADIAN POPLARS. Tech. Note For. Prod. Res. Br. Can. No. 24, 28 pp. 14 refs.

Deals with *Populus tremuloides*, *P. grandidentata*, *P. balsamifera*, *P. deltoides*, *P. trichocarpa*, *P. acuminata*, *P. angustifolia*, and *P. sargentii*.

Mayer-Wegelin, H. 1951. POPLAR WOODS PROPERTIES AND USES. Transl. For. Prod. Lab., Can. No. 63. 1953. 11 pp.

Transl. by O. Feihl from *Das Pappelbuch* (editor H. Hesmer). [See Hesmer, 1951, *Populus* sp., 0.]

Stojanov, V., and Enceev, E. 1950. PRINOS KAM IZUCAVANE TEHNOLOGICESKITE KACESTVA NA TOPOLOVATA DARVESINA OT CUZDOZEMNITE VIDOVE TOPOLI, KULTIVIRANI U NAS. [THE TECHNOLOGICAL PROPERTIES OF THE WOOD OF EXOTIC POPLAR SPECIES CULTIVATED IN BULGARIA.] Izvestijana Biologiceskija Institut, Otdelenie za Biologiceski i Medicinski Nauki, Balgarska Akademija na Naukite, Sofia No. 1: 157-202. [Bulg.bulg.f.]

Species tested are *P. prjewalski*, *P. canadensis*, and *P. pyramidalis*.

Zircher. 1936. POPLAR WOOD-ITS TECHNICAL QUALITIES AND USES. Allg. Forst- u. Jagdztg. 112(10): 335-41. [G.]

811 STRUCTURE. IDENTIFICATION

Johnston, D. R. 1952. STRUCTURE DRAWINGS TO "SPECIMEN WOODS." Sheet 16. Wood 17(10): 391.

Poplar (*Populus* spp.), **greenheart** (*Ocotea rodiaei*), **coachwood** (*Ceratopetalum apetalum*), **and** **robinia** (*R. pseudoacacia*).

Reno, J., and Kukachka, B. F. 1950. RENO-KUKACHKA WOOD IDENTIFICATION CHART NO. 1. COMMERCIAL HARDWOODS PART 5. (COTTONWOOD AND ASPEN; YELLOW-POPLAR.) Wood, Chicago 5(5): 26-7.

Sarkany, S., Stieber, J., and Fillo, Z. 1957. A QUANTITATIVE XYLOTOMICAL ANALYSIS OF POPULUS SPECIES IN HUNGARY. Abstr. in Acta Biol., Budapest, Suppl. No. 1: 40-1. [E.]

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Herrmann, H. 1922. COMPARATIVE WOOD ANATOMY OF POPLARS AND WILLOWS. Extr. Trans. Bot. Archiv, p. 60.

Sarkany, S., Stiever, J., and Fillo, Z. 1957. INVESTIGATIONS ON THE WOOD OF HUNGARIAN POPULUS SPECIES BY MEANS OF QUANTITATIVE XYLOTOMY. Annales Universitatis Scientiarum Budapestinensis (Sect. Biol.) No. 1: 219-29. 10 refs. [E.g.russ.]

Schulz, H. 1962. [ON THE EFFECT OF EXTREME GROWTH CONDITIONS ON THE WOOD OF VARIOUS POPLAR CLONES.] Holz Roh- u. Werkstoff 20(9):347-51. 16 refs. [G.g.e.]

1962. THE EFFECT OF EXTREME GROWTH CONDITIONS ON THE WOOD OF VARIOUS POPLAR CLONES. Transl. Commonw. Sci. Industr. Res. Organ. Aust. No. 6555, 11 pp. 1963. 16 refs. Transl. by E. Bolza from Holz Roh-u. Werkstoff 20(9): 347-51.

81.1.2

Traynard, P., and Ayroud, A. M. 1952. ETUDE DE LA REPARTITION DE LA LIGNINE DANS LA MEMBRANE PAR ACTION DU CHLORE SUR LE BOIS DE PEUPLIER. [DISTRIBUTION OF LIGNIN IN THE CELL WALL, STUDIED BY MEANS OF THE ACTION OF CHLORINE ON POPLAR WOOD.] Rev. Gen. Bot. 59(706): 561-79. 34 refs. [F.]

and Ayroud, A.M. 1952. ACTION DU CHLORE EN MILIEU ANHYDRE SUR LE BOIS DE PEUPLIER. [ACTION OF CL IN AN ANHYDROUS MEDIUM ON POPLAR WOOD.] Bull. Soc. Chim. France 19: 1001-5. 23 refs. [F.f.]

and Ayroud, A. M. 1953. ETUDE DE LA CELLULE VEGETALE DE BOIS DE PEUPLIER AU MOYEN DE LA CHLORATION. [INVESTIGATION OF THE POPLAR WOOD CELL BY MEANS OF CHLORINATION.] Bull. Ass. Tech. Industr. Pap. 1953(6): 153.63. 36 refs. [F.f.]

81 1.142

Braun, H. J. 1959. DIE VERNETZUNG DER GEFASSE BEI POPULUS. [VESSEL NETWORK IN POPLAR WOOD.] Z. Bot., Stuttgart 47 (5) : 421-34. 11 refs. [G.g.e.]

1959. THE PLEXUS [NETWORK] OF VESSELS IN POPLAR WOOD. Transl. Commonw. Sci. Industr. Res. Organ. Aust. No. 5216, 11 pp. 1961. 11 refs.

Transl. by W. Harkins from Z. Bot., Stuttgart 47(5):421-34.

81 1.156

Koziel, S. 1953. RECHERCHES SUR LA LONGUEUR DE FIBRES DU BOIS. [LENGTH OF WOOD FIBRES.] Bull. de la Soc. des Sci. et des Lettres de Lodz. Classe III de Sci. Mathematiques et Naturelles 4(13). 2 pp. [F.]

Meyer-Uhlenried, K. H. 1959. UBER DIE VERERBUNG DER HOLZ-FASERLANGEN BEI VERSCHIEDENEN ARTEN DER GATTUNG POPULUS. [INHERITANCE OF WOOD-FIBRE LENGTHS IN VARIOUS SPECIES OF POPULUS.] Zuchter 29(3) : 117-23. 20 refs. [G.g.]

81 1.158

Buggenhoudt, M. "an. 1954. BOIS. CONTRIBUTION A L'ETUDE DES FIBRES GELATINEUSES. [WOOD. CONTRIBUTION TO THE KNOWLEDGE OF GELATINOUS FIBRES.] Union Allumettiere, Overboelare, Belgium. 19 pp. [F.]

81 1.22

Giovanni, M. U. di. 1953. DATI DIMENSIONALI SULLE FIBRE DI TENSIONE DEL LEGNO DI PIOPPO. [DATA ON THE DIMENSIONS OF TENSION-WOOD FIBRES OF POPLAR.] Nuovo G. Bot. Ital. (n.s.) 60(12) : 239-50. 5 refs. [Ite.]

Klauditz, W., and Stolley, I. 1955. UBER DIE BIOLOGISCH-MECHANISCHEN UND TECHNISCHEN EIGENSCHAFTEN DES ZUGHOLZES. [BIOLOGICAL-MECHANICAL AND TECHNOLOGICAL PROPERTIES OF TENSION WOOD.] Holzforschung, Berlin 9(1) : 5-10. 17 refs. [G.g.e.]

Patscheke, G., Kramer, W., and Berger, S. 1961. [THE DISTRIBUTION OF TENSION WOOD IN THE STEM AND IN COPPICE SHOOTS OF POPLAR.] Arch. Forstw. 10(4/6) : 586-602. 7 refs. [G.g.russ.e.]

Sacre, E. 1959. LE BOIS DE TENSION DES PEUPLIERS. [TENSION WOOD IN POPLARS.] Bull. Inst. Agron. Gcmloux 27(4) : 435-44. 10 refs. [F.]

812 PHYSICAL AND MECHANICAL PROPERTIES

Campredon, J., and Villiere, A. 1954. ETUDES SUR LE BOIS DE PEUPLIER ROBUSTA. [STUDIES ON THE WOOD OF $\times$ POPULUS ROBUSTA.] Rev. For. Franc. 6(5) : 311-5. [F.]

A preliminary report on studies made by the Centre Technique du Bois at the suggestion of the International Poplar Commission, in order to determine standard methods of testing poplar wood. The study was made on 14 logs of the hybrid *P. robusta* from seven trees of different provenances and included sawing, seasoning, and veneer peeling as well as mechanical strength tests.

Jayme, G., Schenck, U., and Rothamel, L. 1949. UBERGESETZMASSIGE ANDERUNGENDER EIGENSCHAFTEN INNERHALB DESSELBEN STAMMES "ON PAPPELHOLZERN. [ON THE REGULAR CHANGES OF PROPERTIES WITHIN THE SAME STEM OF POPLAR.] Papier, Darmstadt 3(112) : 1-7. 7 refs. [G.g.]

Klauditz, W. 1956. TECHNOLOGISCHE EIGENSCHAFTEN DES PAPPELHOLZES UND SEINE WIRTSCHAFTLICHE EIGNUNG ZUR HERSTELLUNG "ON HOLZWERKSTOFFEN. [THE TECHNOLOGICAL PROPERTIES OF POPLAR WOOD, AND ITS SUITABILITY, ECONOMICALLY, FOR THE MANUFACTURE OF WOOD-BASED WORKING MATERIALS.] Abstr. in Holz-Zbl. 82(30) : 391-2. [G.]

Contains data on green weight/c.c. of wood of individual annual rings of *P. regeneratagrandis*, their lignin and cellulose content in connection with the amount of tension wood they contain. Within each annual ring green weights are fairly stable, and each piece of timber is fairly homogeneous as regards strength properties, but there are great differences between various hybrids. Chipboards from poplar wood are stronger per unit weight than, e.g., spruce chipboard, but the low weight means lower output per cu.m. of wood.

Krzysik, F., and Gonet, B. 1952 and 1953. FIZYCZNE I MECHANICZNE WLASNOSCI DREW. 4 NIEKTORYCH GATUNKOW I KRZYZOWEK TOPOLI. [PHYSICAL AND MECHANICAL PROPERTIES OF THE WOOD OF SOME POPLAR SPECIES AND HYBRIDS [IN POLAND].] Sylwan 96(4) : 433-68; 97(1) : 28-46. 35 refs. [Pol.russ.e.]

Mayer-Wegelin, H. 1958. DIE VERWENDBARKEIT DES PAPPELHOLZES AUFGRUND SEINES AUFBAUES "ND SEINER KENNZEICHNENDEN EIGENSCHAFTEN. [UTILIZABILITY OF POPLAR WOOD ON THE BASIS OF STRUCTURE AND CHARACTERISTIC PROPERTIES.] Holzforschung, Berlin 11(5/6) : 130-9. 72 refs. [G.g.e.]

Pallay, N. 1957. AMAGYARORSZAGI TERMUHELYEKEN NOTT NYARFAJOK MUSZAKITULAJDONSAI. [THE [WOOD] PROPERTIES OF SOME POPULUS SPP. GROWN IN HUNGARY.] Erdomern. Foisk. Kozl. No. 2 : 33-78. [Hu.]

Tabulates and graphs physical and mechanical properties of samples of *P. alba*, *P. nigra*, *P. tremula*, *P. $\times$ marilandica*, *P. $\times$ serotina*, and *P. $\times$ robusta* grown in Hungary.

812.152

Stofko, J., and Adamca, M. 1956. PRISPEVOK K POZNANIU DIELEKTRICKYCH VLASTNOSTI NASICH DREVIN A GLEJOV. [DIELECTRIC PROPERTIES OF CZECHOSLOVAK TIMBERS AND GLUES.] Drev. Vyskum 1(1/2) : 69-82. 7 refs. [Slovak.slovak.russ.g.]

812.31

Gohre, K. 1958. UBER DIE VERTEILUNG DER ROHWICHT IM STAMM "ND IHRE BEEINFLUSSUNG DURCH WUCHSGEBIET "ND STANDORT. [THE DISTRIBUTION OF DENSITY THROUGH THE STEM, AND THE EFFECT ON IT OF GROWTH REGION AND SITE.] Holz Roh- u. Werkstoff 16(3) : 77-90. [G.g.e.]

1958. THE DISTRIBUTION OF THE SPECIFIC GRAVITY IN THE STEM AND THE INFLUENCE OF REGION OF GROWTH AND LOCALITY ON THE SPECIFIC GRAVITY OF WOOD. Transl. U. S. For. Serv. For. Prod. Lab., Madison No. 380, 16 pp. 1959. 14 refs. Transl. from the German by D. Pronin from Holz Roh- u. Werkstoff 16(3) : 77-90.

812.72

Giordano, G., and Curro, P. 1956. COMPRESSION STRENGTH IN THE WOOD OF THREE POPLAR STEMS WITH RESPECT TO THEIR SPECIFIC GRAVITY. [Docum.] 12th Congr. Int. Union For. Res. Organ., Oxford 1956 No. IUFRO/56/41/6 Rev. 10 pp. 2 refs. [E.] For all three poplars (two trees of *P. $\times$ euramericana* "I 214", one each from Alessandria and Pisa, and one tree of *P. tremula* from Cosenza), compression strength increased with specific gravity. Graphs show experimental and calculated results.

Walkenhorst, R. 1956. UNTERSUCHUNGEN AN PAPPELHOLZ. [INVESTIGATIONS INTO [STRENGTH PROPERTIES OF] POPLAR WOODS.] Holz-Zbl. 82(124) : 1507-9. 16 refs. [G.g.] Analysis of more than 2,000 samples taken from 12 stems (in all) of *Populus robusta*, *P. regenerata*, *P. serotina*, *P. trichocarpa*, and *P. berolinensis* from four German sites indicated that mean compressive strength was greatest in *P. robusta* and lowest in *P. trichocarpa*, tended to be higher on the better sites and to increase up the stem. The amount of tension wood present (greatest in *P. robusta*) and its distribution showed no connection with site or wind direction. Mean strength of samples containing tension wood was 2.3; less than that of samples without, but for samples from identical growth layers the difference was 18% oven-dry, and 45.2% green.

813 WOOD CHEMISTRY

[France] 1951. ETUDES CHIMIQUES DE DIVERSES ESPECES DE PEUPLIERS. [CHEMICAL STUDIES OF DIFFERENT SPECIES OF POPLAR.] Rapp. Fonds For. Nat. Jan.-Juin 1951: 52. [F.]

Guillemain-Gouvello, J. 1952 and 1954. ETUDE CHIMIQUE DE DIFFERENTS TYPES DE PEUPLIERS. [CHEMICAL ANALYSIS OF DIFFERENT TYPES OF POPLARS.] Memorial des Services Chimiques de l'Etat, Paris 37(4) : 293-6; 39(4) : 231-3. [F.] Presents the chemical analysis of the wood of several poplars of the sections *Aigeiros* and *Tacamahaca* or hybrids, giving cellulose and lignin content, extractives, furfural index and ash content in relation to dry weight, with data on site, age of tree, and

position of sample in tree. Research into effects Of variety, site factors, age, etc., continues.

Jayme, G. 1949. CHEMISCHE UNTERSUCHUNGEN AN PAPPELHOLZERN. [CHEMICAL RESEARCH ON POPLAR WOODS.] Papier, Darmstadt 3(17/18): 339-42. 10 refs.[G.]

Pearl, I. A., and Beyer, D. L. 1961. STUDIES ON THE CHEMISTRY OF ASPENWOOD. "II. FURTHER STUDIES ON THE ETHER EXTRACTIVES OF COMMERCIAL ASPEN SPENT LIQUOR. J. Organ. Chem. 26(2): 546-50. 15 refs.

Extractives of a liquor from the pulping of peeled mixed aspen (Populus tremuloides, P. grandidentata, and P. tacamahaca were investigated). [Cf. Pearl and Beyer, 1960, P. tremuloides, 813.1

— and Justman, O. 1961. STUDIES ON THE CHEMISTRY OF ASPENWOOD. XIII. FURTHER STUDIES OF THE NEUTRAL EXTRACTIVES OF COMMERCIAL ASPEN SPENT SULFITE LIQUOR. J. Organ. Chem. 26(9): 3563-4. 10 refs.

— and McCoy, P. F. 1961. STUDIES ON THE CHEMISTRY OF ASPENWOOD. "III. AN INVESTIGATION OF THE NEUTRAL EXTRACTIVES OF COMMERCIAL SPENT ASPEN LIQUOR. [FROM POPULUS TREMULOIDES, P. GRANDIDENTATA AND P. TACAMAHACA PULPED TOGETHER]. J. Organ. Chem. 26(2):550-2. 8 refs.

813.1

Jayme, G. 1951. UBER DIE BEDEUTUNG DES ZUGHOLZANTEILS IN PAPPELHOLZERN. [THE SIGNIFICANCE OF TENSION-WOOD IN POPLAR.] Holz Roh- u. Werkstoff 9(5): 173-5. [G.g.]

— 1951. ON THE SIGNIFICANCE OF TENSION WOOD IN POPLARS. Transl. Commonw. Sci. Industr. Res. Organ. Aust. [n.d.] 6 pp. 8 refs.

Transl. from Holz Roh- u. Werkstoff 9(5): 173-5.

813.1.1

Mozeiko, L., and Sergejeva, V. 1958. [THE NATURE OF EXTRACTS FROM YOUNG SHOOTS OF FAST-GROWING POPLARS.] Latvijas PSR Zinatnu Akademijas Vestis, Riga 1958(7): 51-56. [Russ.] From *abstr. in* Holzforschung, Berlin 14(1): 26. 1960. [G.]

Pearl, I. A., Beyer, D. L., and Hickey, E. E. 1958. STUDIES ON THE CHEMISTRY OF ASPENWOOD. II. LIGNANS FROM ASPEN SPENT SULFITE LIQUOR. J. Organ. Chem. 23(5):705-6. 5 refs. [Cf. Pearl and Beyer, 1957, P. tremuloides, 813.1

Read, D. E., and Purves, C. B. 1952. ISOLATION OF PENTA- AND 1,2,4,5-BENZENE-TETRACARBOXYLIC ACIDS FROM [BLACK SPRUCE AND POPLAR] WOOD LIGNINS OXIDIZED WITH ALKALINE PERMANGANATE. J. Amer. Chem. Soc. 74(1):120-3. 22 refs.

Traynard, P., and Eymery, A. 1955. DELIGNIFICATION DES VEGETAUX PAR LES SOLUTIONS HYDROTROPIQUES. [DELIGNIFICATION OF PLANT MATERIAL WITH HYDROTROPIC SOLUTIONS.] Holzforschung, Berlin 9(6): 172-7. 41 refs. [F.f.g.]

— and Eymery, A. 1956. DELIGNIFICATION PAR LES SOLUTIONS HYDROTROPIQUES. II. ETUDE DES LIGNINES HYDROTROPIQUES. [DELIGNIFICATION BY MEANS OF HYDROTROPIC SOLUTIONS. II. INVESTIGATION OF HYDROTROPIC LIGNINS.] Holzforschung, Berlin 10(1): 6-11. 7 refs. [F.f.g.]

A thorough chemical analysis of a hydrotropic lignin from poplar wood seems to indicate that it is a homogeneous preparation. The hypothesis is advanced that a diketone is present in its formula.

— and Robert, A. 1952. EXTRACTION DE LA LIGNINE DU PEUPLIER PAR L'ACIDE NITRIQUE. [EXTRACTING LIGNIN FROM POPLAR BY NITRIC ACID.] Bull. Soc. Chim. France 19(7/8):746-50. 11 refs. [F.f.]

813.13

Jame, G., and Koburg, E. 1958. UBER DIE SCHNELLBESTIMMUNG DES CELLULOSEGEHALTES IN PAPPELHOLZERN. III. EINE VERBESSERTE PARALLELBESTIMMUNGSMETHODE. [RAPID DETERMINATION OF CELLULOSE CONTENT IN POPLAR WOODS. III. AN IMPROVED METHOD OF PARALLEL DETERMINATION.] Holzforschung, Berlin 11(5/6): 142-50. 18 refs. [G.g.e.]

— and Schenck, U. 1948. UBER DIE SCHNELLBESTIMMUNG DES CELLULOSEGEHALTES "ON PAPPELHOLZERN. [A RAPID METHOD OF DETERMINING THE CELLULOSE CONTENT OF POPLAR WOOD.] Papier, Darmstadt 2(17/18): 323-7. 17 refs. [G.g.]

813.2

Grosjean, J. 1950. SUBSTANCES WITH FUNGICIDAL ACTIVITY IN THE BARK OF DECIDUOUS TREES. Nature, Lond. 165(4204): 853-4. 2 refs.

Jayme, G., and Rothamel, L. 1944. COMPOSITION OF THE EXTRACTIVES OBTAINED FROM BLACK POPLAR WOOD AND OF THOSE FOUND IN THE RESULTING SULPHITE AND SULPHATE PULPS. Cellulosechemie 2: 88-96. Chem. Abstr. 40: 2980. 1946.

Roudier, A., Roudier, A., and Eberhard, L. 1952. L'ESSAI D'EXTRACTION A L'EAU A" COURS DE L'ANALYSE DES MATIERES PREMIERES CELLULOSIQUES. [EXPERIMENT IN WATER EXTRACTION DURING THE ANALYSIS OF CELLULOSIC RAW MATERIALS.] APPENDICE. EXTRACTION D" BOIS DE PEUPLIER (X POPULUS ROBUSTA SCHNEIDER) PAR L'EAU A 140". [APPENDIX. EXTRACTION OF WOOD OF X P. ROBUSTA WITH WATER AT 140" C.] Memorial des Services Chimiques de l'Etat, Paris 37(2):109-32. 21 refs. [F.f.]

815 EFFECT OF GROWTH FACTORS ON STRUCTURE AND PROPERTIES

Jayme, G. 1947. UBER DEN EINFLUSS DER SORTEN UND DES STANDORTES AUF DIE CHEMISCHE ZUSAMMENSETZUNG UND EIGNUNG "ON PAPPELHOLZERN ZUR ZELLSTOFFGEWINNUNG. [THE INFLUENCE OF SPECIES AND SITE ON THE CHEMICAL COMPOSITION OF POPLAR WOOD AND ITS SUITABILITY FOR PULPING.] Papier, Darmstadt 1(9/10): 182-90. 15 refs. [G.g.]

Kennedy, R. W., and Smith, J. H. G. 1959. THE EFFECTS OF SOME GENETIC AND ENVIRONMENTAL FACTORS ON WOOD QUALITY IN POPLAR. Pulp Paper Mag. Can. 60(2):T35-T36. 9 refs. Also in Res. Note Fac. For. Univ. B. C. No. 19.

815.2

Johnson, L. P. V. 1942. STUDIES ON THE RELATION OF GROWTH RATE TO WOOD QUALITY IN POPULUS HYBRIDS. Canad. J. Res. 20, Sec. C: 28-40. Bblg.

82 CONVERSION, SHAPING, ASSEMBLY AND FINISHING OF WOOD: GENERAL

Fenchel, U. 1958. UNTERSUCHUNGEN UBER DIE ENTRINDUNGSFAHIGKEIT "ON PAPPELHOLZ BEI THERMISCHER VORBEHANDLUNG "ND NACHFOLGENDER TROMMELUNG. [EASE OF BARKING OF POPLAR IN DRUM BARKING AFTER HOT-WATER TREATMENT.] Wochenblatt fur Papierfabrikation, Biberach 86(18): 793-6. [G.g.]

Freshly felled poplar was drum-barked in 45 min. after receiving 4 hours' hot-water treatment at 90" C., whereas untreated poplar took 2 hours to bark.

825.71

Pahlitzsch, G., and Mehrdorf, J. 1963. [CHIP MANUFACTURE WITH FLAT-DISK CHIPPERS. 4. CHIPPING POPLAR AS COMPARED WITH PINE.] Holz Roh- u. Werkstoff 21(4): 144-9. 5 refs. [G.g.e.]

83 TIMBER MANUFACTURING INDUSTRIES AND PRODUCTS

Croce. 1932. "SE AND EXPLOITATION OF POPLARS. Biol. Abstr. 6: 17048.

Houtzagers, G. 1937. POPLAR AS A UTILITY WOOD. Ned. Boschb.-Tijdschr. 10(8): 289-96. [Du.]

Tessier. 1932. NOTE ON THE GENUS POPULUS USES AND QUALITY OF WOOD. Rev. Eaux For. 70: 288.

Thornewill. 1924. USES IN SOUTH AFRICA. J. Oxf. Univ. For. Soc. 5: 30.

83/86

[Germany: Holzzucht] 1961. PAPPELHOLZVERWERTUNG-FLURHOLZVERWERTUNG. [THE UTILIZATION OF POPLAR WOOD AND OF POPLAR OR OTHER WOOD GROWN OUTSIDE THE FOREST.] Holzzucht, Reinbek 15(3/4): 11-46. Many refs. [G.]

832.2

Liese, 1932. USE OF POPLAR WOOD IN PLYWOOD MAKING. Forstl. Rundschau 5: 47.

Millan, T. 1943. SWELLING OF POPLAR VENEER DURING AND AFTER PHENOLIC-RESIN IMPREGNATION. Plastics Trends 3 (3) : 5-6. Chem. Abstr. 37: 3528.

Paraschiv, E., Oradeanu, T., Marinescu, D., and others. 1961. [THE MANUFACTURE OF PLYWOOD AND BLOCKBOARDS FROM POPULUS X REGENERATA CV. CELEI, P. DELTOIDES VIRGINIANA CV. CETATE AND P. X MARILANDICA.] Stud. Cerc. Inst. Cerc. For., Bucuresti 22B: 209-31. 31 refs. [Rum.russ.g.e.]

Pilot- and semi-industrial-scale *experiments* indicated that only the first of these *three* poplars is suitable for this *purpose*; *logs of less* than 35 cm. diameter are *unsuitable*, but *larger* logs peel well and no difficulties arose over gluing or pressing.

Regnier, R. 1952. IMPORTANCE DES DEGATS DE LA MINEUSE DU CAMBIUM DU PEUPLIER POUR L'INDUSTRIE DU DEROULAGE. [THE IMPORTANCE OF DAMAGE BY A CAMBIUM BORER IN POPLAR TO THE VENEER INDUSTRY.] Trans. 9th Int. Congr. Ent., Amsterdam 1951 (1) : 711-4. 7 refs. [F.e.]

Rostler, G. 1943. STRESS-STRAIN IN COMPRESSION OF RESIN-BONDED PLYWOODS. Brit. Plastics 14(165) : 534.

[U.S.A.: For. Prod. Lab.] 1957. VENEER CUTTING AND DRYING PROPERTIES. ASPEN AND HYBRID POPLAR. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. 1766-13, 4 pp. 7 refs. Populus tremuloides, P. grandidentata, P. charkowiensis X P. robusta, P. charkowiensis X P. caudina.

832.3

Anonymous. 1925. POPULUS FOR MATCHES. Rep., For. Dep., Union Sth. Afr. 1924125: 23.

[Austria: Int. Holzmarkt] 1954. DIE PAPPEL IN DER ZUNDHOLZ-INDUSTRIE. [POPLAR FOR MATCH MANUFACTURE.] Int. Holzmarkt 45(2) : 16-7. [G.]

Discusses the relative *merits as* regards chemical and mechanical properties and ease of manufacture of *spruce and different poplar species*.

833 TIMBER IN BUILDINGS AND ENGINEERING STRUCTURES (MANUFACTURE AND USE)

Bell, L. E., and Jefferson, C. H. 1944. USING JACK PINE AND POPPLE FOR FARM BUILDING. Ext. Bull. Mich. St. Coll. No. 255, 23 pp. Bblg.

835 INDUSTRIAL AND DOMESTIC WOODWARE (MANUFACTURE AND USE)

Anonymous. 1936. POPLAR WOOD FOR STOPPERS. Dtsch. Forstw. 18(71) : 876. [G.]

Kullmann. 1936. [MARXEN STOPPERS--CORKS OF GERMAN WOOD, MADE OF POPLAR AND ASPEN WOOD; SUPERIOR TO CORK IN FREEDOM FROM CONTAMINATION AND IN DURABILITY.] Holztechnik 16(21) : 348-350. [G.]

836.1

Najera y Angulo, F. 1955. L'UTILISATION DU BOIS DE PEUPLIER EN ESPAGNE: SON EMPLOI EN EBENISTERIE. [THE UTILIZATION OF POPLAR WOOD IN SPAIN: ITS USE IN CABINET-MAKING.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 3, 7 pp. [F.]

838.7

Winter, H. 1956. PAPPELHOLZ ALS WERKSTOFF IM FLUGZEUGBAU UND LEICHTBAU. [POPLAR WOOD AS CONSTRUCTION MATERIAL IN AIRCRAFT AND OTHER LIGHT CONSTRUCTIONS.] Abstr. in Holz-Zbl. 82(30) : 392. [G.]

Contains a table of various strength properties for poplar wood of 12% m.c. It is suitable for cores of *plywoods* and sandwich constructions, and for parts of gliders, light aircraft, etc., not *subject to heavy stresses*.

839.1

Giordano, G. 1957. LE BOIS DE PEUPLIER AU SERVICE DE LA MODE FEMININE. [POPLAR WOOD IN THE SERVICE OF WOMEN'S FASHIONS.]

Rev. Bois Appl. 12(6) : 16-8. [F.]

Describes the *manufacture of very long, narrow shavings from the wood of American poplar hybrids*, used in Italy for making plaited articles (mainly hats).

Najera Angulo, F. 1959. SECCION DE MADERAS. CLASES DE MADERA MAS CONVENIENTES PARA SU EMPLEO COMO ELEMENTO COALESCENTE DEL AGUA QUE CONTIENEN LA GASOLINA Y OTROS CARBURANTES. [TIMBER SECTION. TYPES OF WOOD SUITABLE FOR USE AS A WATER ABSORBENT IN PETROL AND OTHER FUELS.] An. Inst. For. Invest. Exp., Madrid 31(4) : 51-3. [Span.]

Tronco, G. 1961. LA MODA SI FA COL PIOPO. [FASHION MAKES USE OF POPLAR.] Ital. Agric. 98(6) : 575-83. [It.] An account of the chip hat industry of *Carpi*, which chiefly uses poplar wood specially *grown for the purpose* and felled at not more than 8 years old. The clone "488 B" is considered the most suitable on account of its *erect* cylindrical stem and freedom from tension wood.

84 PRESERVATION AND OTHER TREATMENTS TO IMPROVE THE PROPERTIES OF WOOD. DAMAGING INFLUENCES.

844 ATTACK BY PLANT ORGANISMS

Martinez, J. B. 1955. HONGOS Y ENFERMEDADES DE LOS CHOPOS EN ESPANA, INCLUYENDO PUDRICIONES Y ALTERACIONES CROMOGENAS DE LA MADERA. [FUNGUS AND OTHER DISEASES OF POPLARS IN SPAIN, INCLUDING WOOD ROT AND STAINS.] [Pap.] 8th Sess. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 8, 17 pp. [Span.] Lists *the* causal organisms, with literature references.

844.1

Rogister, J. 1955. HET VERBLAUWEN VAN HOUT. [BLUE STAIN IN WOOD.] Meded. Lab. Houttechnol., Gent No. 13, '78 pp. 110 refs. [Flem.flem.f.e.g.]

844.2

Fritz, C.W. 1954. DECAY IN POPLAR PULPWOOD IN STORAGE. Canad. J. Bot. 32(6) : 799-817. 17 refs.

Lohwag, K. 1959. HOLZFAULEN AN PAPPELHOLZ. [WOOD-ROT-TING FUNGI ON POPLAR.] Istanbul Univ. Orm. Fak. Derg. 9A(1) : 1-10. 1 ref. [G.turk.g.turk.]

Discusses damage by *Fomesignarius* on standing trees, and by *Stereum purpureum*, *Polystictus hirsutus*, and *Schizophyllum commune* on logs in a *storage* depot. Preventive and control measures are also discussed.

844.4

Barbey, A. 1935. COMMENT LUTTER CONTRE L'EXTENSION DES DOMMAGES TECHNIQUES DU BOIS PEUPLIER. [HOW TO LIMIT THE SPREAD OF INSECT AND FUNGAL DAMAGE IN POPLAR TIMBER.] Bull. Corn. For., Paris No. 64: 473-79. [F.]

85 "GRADING" OF WOOD AND WOOD PRODUCTS

852.16

[International: FAO/Int. Poplar Comm.] 1955. BLACK HEARTWOOD: REPORT OF THE NATIONAL POPLAR COMMISSION OF THE NETHERLANDS. [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/78-A, 2 pp. [E.]

This defect is found mainly in poplars grown on excessively wet sites, e.g., with stagnant *groundwater*. Heartwood of X Populus gelrica and P. deltoides subsp. missouriensis is generally lighter in color than that of X P. marilandica, X P. serotina, and especially P. robusta. For the most part the defect does not cause serious loss in industry.

1955. COEUR NOIR DU PEUPLIER. [BLACK HEART IN POPLAR.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/78-C, 2 pp. [F.]

A report of the Belgian Poplar Commission on the *results of* their inquiry. Most users of poplar wood do not consider black heart *worthy of a mention*, but the Union Allumettiere considers it a *serious* defect, resulting either in matches and match boxes of inferior *quality*, or by *avoiding it*, an unsatisfactory output per unit of *timber*.

Jayme, G., and Harders-Steinhauser, M. 1953. ZUGHOLZ UND SEINE AUSWIRKUNGEN IN PAPPEL- "ND WEIDENHOLZ.[TENSION WOOD AND ITS EFFECTS IN POPLAR AND WILLOW WOOD.] *Holzforschung*, Berlin 7(2/3): 39-43. 10 refs.[G.g.e.]

Harders-Steinhauser, M., and Mohrberg, W. 1951. EINFLUSS DES ZUGHOLZANTEILS AUF DIE TECHNOLOGISCHE UND CHEMISCHE VERWENDBARKEIT " ON PAPPELHOLZERN. [EFFECT OF THE TENSION WOOD CONTENT ON TECHNOLOGICAL AND CHEMICAL UTILIZABILITY OF POPLAR WOOD.] *Papier*, Darmstadt 5(19120; 21122; 23124): 411-7; 445-7; 504-7. 18 refs. [G.g.]

Harders-Steinhauser, M., and Mohrberg, W. 1951. INFLUENCE OF THE TENSION-WOOD FRACTION ON THE CHEMICAL AND TECHNOLOGICAL USEFULNESS OF POPLAR. *Transl. Commonw. Sci. Industr. Res. Organ. Aust. No. 1683*, 13 pp. 1952. 11 refs. *Transl. by M. Slade from Papier*, Darmstadt 5(19/20):411-7.

Klauditz, W. 1958. ZUM CELLULOSE- UND ZUGHOLZGEHALT DES HOLZES "ON PAPPELN. [THE CELLULOSE AND TENSION-WOOD CONTENT OF POPLAR WOOD.] *Holzforschung*, Berlin 11(5/6): 158-69. 38 refs. [G.g.e.]

Peace, T. R. 1955. BLACK HEARTWOOD. [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/78-B, 2 pp. [E.] Reports on a preliminary inquiry on the occurrence of black heartwood in poplar grown in Britain. There appears to be evidence that trees grown on low, wet sites are particularly subject to this defect. On the other hand, trees grown in Herefordshire and Shropshire, on Old Red Sandstone, produce particularly pale heartwood. $\times$ *P. regenerata* is said to be particularly subject to dark heart.

852.18

Pacft, J. 1953. ODLUPCIVOST' TOPOL'OV A JEJ POVODCA. [RING-SHAKES IN POPLARS AND THEIR CAUSE.] *Pol'na* 9 (11): 255-6. [Slovak.]

In addition to *Trichotecium roseum*, preliminary studies have isolated a so far unidentified parasite *Deuteromyces (Sphaeropsidales?)*.

853 GRADING OF WOOD IN THE ROUGH

Meiden, H. A. van der. 1961. WENSEN VAN DE HOUTINDUSTRIE TEN AANZIEN "AN DE TEELT "AN POPULIER. [REQUIREMENTS OF THE TIMBER INDUSTRY AND POPLAR CULTIVATION.] *Ned. Boschb.-Tijdschr.* 33(5):126-30. 4 refs. [Du.due.]

Discusses briefly requirements of various industries (e.g., veneer, match, sawmilling, and clog) as regards clones (*Populus* $\times$ *mariandica* is preferred for matchboxes). pruning, a bark spot probably physiological in nature, etc., and stresses the need for grading rules. [Cf. Meiden, 1957, *Populus* sp., 245.13.]

86 PULP INDUSTRIES

861 PULP AND PAPER MANUFACTURE. TEXTILE AND OTHER CELLULOSE DERIVATIVES

Anonymous. 1927. POPLARS FOR PULP WOOD. *Nature* 119: 869.

1930. HYBRID POPLARS AND PULP PRODUCTION. *Nature* 126: 148.

Brecht, W. 1959. GROUNDWOOD AND CHEMIGROUNDWOOD FROM EUROPEAN POPLARWOOD [UNSPECIFIED]. *Tappi* 48(8) : 664.9. 16 refs.

Reviews and discusses previous European work, and presents data on laboratory tests using various "mild" (notably the *Weiss-huhn*) and "strong" (the *Libby-O'Neill*) chemical pretreatments. Reference is made to pioneer work being done in Canada and the U.S.A.

Bustamente Ezpeleta, L., Pedro Abello, S. de, Barbadillo Gomez, P., and others. 1961. [STUDY OF DIFFERENT POPLARS AS RAW MATERIAL FOR PULP PRODUCTION.] *An. Inst. For. Invest. Exp.*, Madrid 33(6):103-33. 25 refs. [Span.]

Komaroff. 1933. POPLAR AND ITS UTILIZATION FOR CELLULOSE SUPPLY. *Forstl. Rundschau* 6. 197.

McKee. 1931. POPLARS FOR CELLULOSE: PRODUCTION EXPERIMENTS. *Biol. Abstr.* 5: 11766.

861.0

Bialoblocki, B., and Borninski, J. 1954. GROUNDWOOD MANUFACTURE FROM POPLAR. *Przeglad. Papierniczy*, Lodz 10: 168-72. [Pol.]
From *abstr. in Chem. Abstr.* 49(8): 5830. 1955.

Bray, M. W., and Paul, B. H. 1942. PULPING STUDIES ON SELECTED HYBRID POPLARS. *Paper Tr. J.* 115(16): 33-8. *Abstr. in Bull. Inst. Pap. Chem.* 13 :115-6.

Brown, C. L., Saeger, G., and Weiner, J. 1957. CONSTITUTION AND PULPING OF ASPEN AND POPLAR WOODS. *Bibliographic Series*, Inst. Pap. Chem., Appleton, Wis. No. 184, 120 pp.
Contains 317 abstracts arranged alphabetically under authors; in preparing the bibliography. *Bulletins of the Institute of Paper Chemistry (Library Notes) and Chem. Abstr. up to and including 1956 and TAPPI bibliographies between 1900 and 1955 were examined. References to breeding have been omitted.*

Burki, M. 1957. L'UTILISATION DE PEUPLIER DANS L'INDUSTRIE SUISSE DU PAPIER. [THE USE OF POPLAR IN THE SWISS PAPER INDUSTRY.] *Schweiz. Z. Forstw.* 108(1):50-2. [F.]
The present demand is estimated at 37,000 cu.m., of which ca. 2,000 are supplied by Switzerland. Owing to the technical superiority of conifer pulps, demand will always be limited in Switzerland despite the greater cheapness of hardwoods for pulping, as Swiss industry is geared to quality, but a market exists for sound straight wood, not less than 10 cm. thick at the end, of *Populus nigra*, *P. alba*, *P. "canadensis"*, and, above all, *P. tremula*.

Chidester, G. H., Seidl, R. J., and Schafer, E. R. 1955. EXPERIMENTS IN THE MANUFACTURE OF NEWSPRINT FROM COTTONWOOD AND WILLOW. *Rep. U. S. For. Serv. For. Prod. Lab.*, Madison No. 2028, 10 pp. 5 refs.

Results of comprehensive pulping tests indicate that newsprint can be manufactured from a blend of cottonwood groundwood and semi-bleached softwood sulphate pulp in the usual proportions. Willow groundwood gave paper of good quality when forming up to 30% of the furnish.

Clark, D. J. 1957. THE USE OF COTTONWOOD FOR PULP. *Tappi* 40(1):133A-135A. 5 refs.

Craig, K. A. 1949. THE USE OF VARIOUS POPLAR MECHANICAL OR GROUNDWOOD PULPS CONTAINING ROT IN HIGH-GRADE BOOK PAPER. *U. S. Patent No. 2,474,034*, June 21, 1949. *Chem. Abstr.* 43(17): 6826. 1949.

[France] 1951. ESSAIS DE FABRICATION DE PATES A PAPIER A L'AIDE DE BOIS D'EMBALLAGE (PEUPLIER) : (PROCEDES NITRO-SODIQUES). [EXPERIMENTAL PULPING OF POPLAR WOOD FROM USED CRATES BY NITRIC-ACID/SODA PROCESSES.] *Rapp. Fonds For. Nat. Jan./Dec. 1950, Annexe 11 1951: 6-8.* [F.]

Jayme, G. 1948. POPLAR WOOD FOR PULP MANUFACTURE: FACTORS AFFECTING SUITABILITY. *Industr. Chem., Lond.* 24(283) : 545-9. 25 refs.

1955. L'ESAME DEI DIVERSI LEGNI DI POPPO COME MATERIA PRIMA PER LA PREPARAZIONE DELLA CELLULOSA. [THE EXAMINATION OF THE WOOD OF SEVERAL SPECIES OF POPLAR AS RAW MATERIAL FOR PULP.] *Cellulosa e Carta* 6(3) : 6-21. 25 refs. [It.it.]

Reviews in detail, with experimental data, the work of the author and others on the physical, mechanical, and chemical properties of poplar wood and their effect on pulping quality, including methods of analysis.

Jayme, J., Hindenburg, K. -G., Harders-Steinhauser, M., and Branschheid, F. 1943. UBER DIE EIGNUNG EIN-UND ZEHNJAHRIGEN PAPPELHOLZES ZUR ZELLSTOFFGEWINNUNG. [ON THE SUITABILITY FOR PULP MANUFACTURE OF 1- AND 10-YEAR-OLD POPLAR WOOD.] *Holz* 6(1) : 1-16. Bblg. [G.g.]

Klauditz, W., and Berling, K. 1951. UNTERSUCHUNGEN UND FESTSTELLUNGEN UBER DIE EIGNUNG EINIGER SCHNELLWUCHSIGER HOLZARTEN ZUR HERSTELLUNG " ON PAPIER, ZELLSTOFFEN, HOLZFASER-UND HOLZSPANPLATTEN. [RESEARCH AND CONCLUSIONS ON THE SUITABILITY OF SOME FAST-GROWING TREE SPECIES FOR THE MANUFACTURE OF PAPER, PULPS, FIBREBOARDS, AND CHIPBOARDS.] *Tagungsbericht des Vereins fur Technische Holzfragen*, Braunschweig, 1951: 23-39. 19 refs. [G.]

Krzysik, F., and Gonet, B. 1954. POPLAR AS A RAW MATERIAL FOR PULP AND PAPER. *Przegląd Papierniczy*, Lodz 10: 161-8. [Pol.] From *abstr.* in *Chem. Abstr.* 49(8): 5830. 1955.

Patt, K. F. 1961. PAPPEL UND BAUMWEIDE ALS FASERHOLZ. [POPLARS AND TREE WILLOWS AS PULPWOOD.] *Forstarchiv* 32(6): 122-4. 9 refs. [G.g.]

Schepp, R. 1956. DIE VERWERTUNGSMÖGLICHKEITEN DES PAPPELHOLZES IN DER ZELLSTOFF- UND PAPIERINDUSTRIE. [POTENTIAL USES OF POPLAR WOOD IN THE PULP AND PAPER INDUSTRIES.] *Abstr.* in *Holz-Zbl.* 82(30): 392. [G.]

Contains data on strength properties of unbleached sulphite and sulphate pulps from *P. tremula* and percents of poplar pulp usable in paper manufacture. As large-scale use will require special plant, sufficient steady supplies must be assured. Low pulp yield/cu.m. is a drawback, affecting prices.

Toth, L. B. 1950. THE UTILIZATION OF FAST-GROWING FOLIAGE TREES, PARTICULARLY POPLARS, IN THE PAPER AND PULPMANUFACTURING INDUSTRY. *Papir Nyomdatechnika* 2(6): 21-3.

From *Hung. Tech. Abstr.* 1951(4): 17. Pine and poplar may be used together in pulping. Poplar should be stored longer because of its higher water content. Pulp yield from poplar is affected by soil conditions. The cellulose content decreases towards the top of the tree. Up to 17 years of age the cellulose content increases, and then starts to decrease.

Vamos, G. 1963. THE UTILIZATION OF POPLAR IN HUNGARY. *Svensk PappTidn.* 66(8): 291-7. [E.e.f.g.]

Gives data on the forest area percent under poplars, the chemical composition of some of the more important species (*Populus alba*, *P. tremula*, *P. nigra*, *P. × euramericana*, *P. × robusta*, *P. × marilandica*, and *P. × serotina*), and characteristics of poplar pulps (groundwood and chemical) and their uses, and discusses the potential increase in the use of poplars for pulping.

861.11

Brecht, W., and Pulst, S. 1956. DIE HERSTELLUNG "ON CHEMISCHEN SCHLIFFEN AUS PAPPELHOLZ. [CHEMICAL GROUNDWOOD FROM POPLAR.] *Holz Roh- u. Werkstoff* 14(6): 234-41. 6 refs. [G.g.]

Craig, K. A. 1949. BLEACHING POPLAR GROUNDWOOD. U. S. Patent No. 2,474,034, June 21, 1949. *Abstr.* in *Paper Tr. J.* 129(21): 31. 1949.

861.12

Rozmej, Z., and Kowalski, J. 1960. WSTĘPNE BADANIA NAD OTRZYMANIEM MASY POLCHEMICZNEJ Z TOPOLI. [PRELIMINARY INVESTIGATIONS ON OBTAINING SEMI-CHEMICAL PULPS FROM POPLAR WOOD.] *Przegląd Papierniczy*, Lodz 16(5): 129-31. [Pol.]

From *abstr.* in *Pol. Tech. Abstr.* No. 1(41): 6858. 1961. Describes laboratory studies on neutral sulphite semi-chemical pulps from poplar wood. It was found that semi-chemical pulps with a yield of ca. 85% were not inferior in strength properties to unbleached sulphite pulps from spruce.

861.12/16

Molnar, L., and Morvay, S. 1952. VIZSGALATOK NYARFACELLULOZ ELOALLITASÁVAL KAPCSOLATBAN. [INVESTIGATIONS ON POPLAR PULP., PAPIR- es Nyomdatechnika, Budapest 4(2): 18-20. [Hung.]

From *Hung. Tech. Abstr.* 5(1): 82. 1953.

861.15

Kerr, W. D., and Hart, J. S. 1957. HIGH YIELD SULPHITE PULPING. PART 8. POPLAR. PART II. *Pulp Paper Mag. Can.* 58(4): 139-45. 4 refs.

Parkinson, L. 1939. SEASONING AS A CONTROL OF PITCH IN POPLAR SULPHITE PULP. *Paper Mill & Wood Pulp News* 62(5): 16-18, 20.

861.19

Pearl, I. A., and Beycr, D. L. 1959. SEPARATING LIGNOSULFONATES FROM CARBOHYDRATES IN ASPEN SPENT SULFITE LIQUOR BY ION EXCHANGE. *For. Prod. J.* 9(10): 381-3. 8 refs.

862.2

Klauditz, W., and Stegmann, G. 1958. UBER DIE EIGNUNG "ON PAPPELHOLZ ZUR HERSTELLUNG "ON HOLZSPANPLATTEN. [SUITABILITY OF POPLAR WOOD FOR THE MANUFACTURE OF CHIPBOARDS.] *Holzforschung*, Berlin 11(5/6): 174-9. 11 refs. [G.g.e.]

Discusses the effect of the low density of poplar wood on the properties of the resulting chipboard, compared with those of chipboards made from spruce, birch, and beech. Poplar may be considered a suitable raw material for chipboard manufacture.

Lazar, L., and Hadnagy, J. 1962. [STUDIES ON PARTICLE FORMATION WITH POPLAR, BEECH, AND QUERCUS CERRIS.] *Faipari. Kutatások*, Budapest 1962(1): 3-64. [Hu.]

Describes the comminuting and screening of chips and discusses their suitability for making particle board, with tabulated and graphed data comparing the physical and mechanical properties of board made from the species examined.

863 WOOD HYDROLYSIS. SACCHARIFICATION

Fries, K. W. 1946. EASILY HYDRATING PULP FROM POPLAR WOOD. *Paper Tr. J.* 122(21): 43-4. Bblg.

89 OTHER ("MINOR") FOREST PRODUCTS

892.49

Pearl, I. A. 1963. ASPEN BARK AS A SOURCE OF ORGANIC CHEMICALS. *For. Prod. J.* 13(3): 122-3. 10 refs.

Briefly summarizes results of research on the constituents of the bark of *Populus tremuloides* (used commercially for the extraction of salicin) and *P. grandidentata*.

——— Beyer, D. L., Laskowski, D., and others. 1960. STUDIES ON THE BARKS OF THE FAMILY SALICACEAE. III. THE ALKALINE HYDROLYSIS OF BARKS OF SEVERAL SPECIES OF THE GENUS *POPULUS*. *Tappi* 43(9): 756-B. 8 refs.

——— Darling, S. F., DeHaas, H., and others. 1961. STUDIES ON THE BARKS OF THE FAMILY SALICACEAE. I. PRELIMINARY EVALUATION FOR GLUCOSIDES OF BARKS OF SEVERAL SPECIES OF THE GENUS *POPULUS*. *Tappi* 44(7): 475-8. 11 refs.

[U.K.: *Gardeners' Chron.*] 1954. BARK FIBRE AND SAWDUST. *Gardeners' Chron.*, Lond. (Ser. 3) 135(3499): 41.

Mentions a pulverized bark product made from poplar bark fibre by a firm of match manufacturers, which has shown itself promising for mulching, as a compost component, a bulb-growing medium, etc.

9 FORESTS AND FORESTRY FROM THE NATIONAL AND INTERNATIONAL POINTS OF VIEW

906 DIRECT ECONOMIC SIGNIFICANCE OF FORESTS

Albisetti, C. 1941. LE PEUPLIER: DE SON IMPORTANCE FORESTIERE ET ECONOMIQUE. [THE POPLAR: ITS FORESTRY AND ECONOMIC IMPORTANCE.] *J. For. Suisse* 92(8): 173-5. [F.]

94 METHODS TO IMPLEMENT FOREST POLICY

945 ADVISORY SERVICES, PUBLICITY, EDUCATION, RESEARCH

945.4

Allegri, E. 1957. RAPPORT AU GOUVERNEMENT DE L'IRAN SUR L'ETABLISSEMENT D'UN CENTRE DE RECHERCHES FORESTIERES. [RE-

PORT TO THE GOVERNMENT OF IRAN ON THE SETTING UP OF A FOREST RESEARCH CENTER.] Expanded Technical Assistance Program, FAO, Rome FAO Report No. 541, 60 pp. [F.] Includes an appendix (40 pp.) on poplar breeding and research in Iran.

Camaiti, M. A. 1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES. ITALIE. [PROGRESS REPORTS OF NATIONAL (POPLAR) COMMISSIONS. ITALY.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-K, 43 pp. 104 refs. [F.] Includes data on organization, membership, and activities (research, breeding, planting programs), a bibliography, and annexes

ON the exchanges of *genetical* material by the Institute at *Casale Monferrato*, the statutes of the (co-operative) poplar *protection* societies, and extent, density, etc., of poplar plantations in the *PO Valley*.

Elorrieta, J. 1957. INFORMES SOBRE LAS ACTIVIDADES DE LAS COMISIONES NACIONALES, ESPAÑA. INVESTIGACIONES SOBRE LOS CHOPOS CULTIVADOS EN ESPAÑA. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. SPAIN. RESEARCH ON POPLARS CULTIVATED IN SPAIN.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-F. Add. 2, 2 pp. [Span.]

Includes a report on heterosis observed in *Populus tremula* x *P. alba* and *P. tremula* x *P. alba* var. *bolleana* hybrids, in contrast to the experience of W. Wettstein and C. Heimbürger, who obtained pool- results with the first combination.

Eren, T. 1957. (1) RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES. TURQUIE. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. TURKEY.] (2) THE IMPORTANCE OF POPLAR FOR TURKEY. [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-M; No. FAO/CIP/86-M. Add. 7 pp.; 5 pp. 5 refs. [F.,E.]

(1) Covers the activities of the Commission since its inception in 1954, including the plans for the erection of a Near-East Poplar Research Station, well under way. (2) Surveys present conditions and possibilities of poplar cultivation for the regions of Thrace, Marmora, the Aegean, Mediterranean, Black Sea, and Central and South Anatolian areas including the competing claims of eucalypts.

1958. FONDATION ET TRAVAUX DEL'INSTITUT DE POPULICULTURE POUR LA TURQUIE ET LE PROCHE-ORIENT. [FOUNDATION AND PROGRAM OF WORK OF THE POPLAR INSTITUTE FOR TURKEY AND THE NEAR EAST.] [Docum.] 14th Sess. Stand. Exec. Comm. Int. Poplar Comm., Rome 1958 No. FAO/CIP/CP/19, 9 pp. [F.] Describes the progress made at the site of the future institute at Izmit, including planting work completed, and future plans, listing the poplar varieties available at the experimental nurseries at Izmit and Ankara as 1- and 2-year-old plants and 1-year cut-back rooted cuttings.

Gaillard, E. 1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES. SUISSE. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. SWITZERLAND.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-C, 15 pp. 8 refs. [F.] A review of the activities of the last 10 years, including a list of clones at the poplar garden at Glanzenberg.

Gunther, H. 1955. BERICHT UBER DEN STAND DER PAPPELFORSCHUNG IN DEN DEUTSCHEN DEMOKRATISCHEN REPUBLIK. [REPORT ON PRESENT POSITION OF POPLAR RESEARCH IN THE D.D.R.] Arch. Forstw. 4(7/8): 662-88. 9 refs. [G.] Given before the Forestry Section of the Deutsche Akademie der Landwirtschaftswissenschaften Berlin, March 10, 1955.

Herbignat, A. 1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1955. BELGIQUE. [PROGRESS REPORTS OF NATIONAL POPLAR COMMISSIONS 1955. BELGIUM.] Docum. Int. Poplar Comm. No. FAO/CIP/82-H, 11 pp. [F.]

Lists varieties tried at the Populetum of Egenhoven and some growth data from trial plots, export and import statistics, etc.

Houtzagers, G., and Burger, F. W. 1956. PROGRESS REPORT OF NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1955: NETHERLANDS. [Pap.] Int. Poplar Comm. No. FAO/CIP/82-D, 8 p p. 11 refs.

[International: FAO/Int. Poplar Comm.] 1955. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1954: ALLEMAGNE. [REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1954: GERMANY.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-F, 8 pp. [F.]

1955. REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1954: NETHERLANDS. [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-G, 9 p p. [E.]

1955. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1954: ITALIE. [REPORTS ON THE ACTIVITIES

OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1954: ITALY.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-H, 10 pp. [F.]

1955. REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1954: TURKEY. [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-I, 10 p p. [E.]

1955. REPORTS OF THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1954: SWEDEN. [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-J, 2 pp. [E.]

1955. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1954: ESPAGNE. [REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1954: SPAIN.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K, 7 pp. [F.]

1956. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1955. FRANCE. [REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1955: FRANCE.] [Pap.] Int. Poplar Comm. No. FAO/CIP/82-A, 7 pp. 5 refs. [F.]

1956. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1955. SUISSE. [REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1955: SWITZERLAND.] [Pap.] Int. Poplar Comm. No. FAO/CIP/82-B, 11 p p. [F.]

1956. PROGRESS REPORT OF NATIONAL COMMISSIONS FOR THE YEAR 1955. EGYPT. [Pap.] Int. Poplar Comm. No. FAO/CIP/82-C, 2 pp. [E.]

Contains notes on poplar varieties introduced and on some local varieties.

1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES DEPUIS 1947 ou DEPUIS LEUR CREATION. RAPPORT DU SECRETARIAT. [PROGRESS REPORTS OF THE NATIONAL [POPLAR] COMMISSIONS SINCE 1947 OR SINCE THEIR FOUNDATION. SECRETARIAT REPORT.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86, 23 pp. [F.]

Summarizes reports of 10 European countries.

1957. RAPPORT D'ACTIVITE DES COMMISSIONS NATIONALES. ESPAGNE. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. SPAIN.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-F; No. FAO/CIP/86-F Add. 1, 8 pp.; 6 p p. [F.]

A report on the organization and activities of the Commission since its inception in 1952, plus a separate account of the activities for the year 1956.

1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES. YOUGOSLAVIE. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. YUGOSLAVIA.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-H, 19 pp. 44 refs. [F.] Covers organizational activities since its inception in 1955.

1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES. ALLEMAGNE. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. GERMANY.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-J, 28 pp. 15 refs. [F.] Contains a general account of organization and activities, with annexes on: the aims and activities of the German Poplar Society; the production of poplar pulpwood (F. Bauer) [cf. Bauer, 1956, *Populus* sp., 238]; biological research at the year 1956 carried out at Bruhl, Hann. Nunden, Munich, Schmalenbeck, and Stuttgart (R. Muller), and at Freiburg i. Br. (F. Bauer). [Cf. Bauer, 1956, *Populus* sp., 176.1.]

1958. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1957. [PROGRESS REPORTS OF THE NATIONAL [POPLAR] COMMISSIONS FOR 1957.1] [Docum.] Int. Poplar Comm. Nos. FAO/CIP/93-B-L & 0; 4 pp.; 7 pp.; 22 pp.; 2 pp.; 7 pp.; 6 pp.; 12 pp.; 13 pp.; 10 pp.; 2 pp.; 4 pp. [F.] Nos. FAO/CIP/93-A, M, & N; 7 p.; 3 pp.; 1 p. [E.] Switzerland; Spain; Italy; Austria; Greece; Turkey; Morocco; Yugoslavia; Germany; France; Lebanon; Syria; United Kingdom; Argentina; and Sweden.

1959. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES DU PEUPLIER. PERIODE 1958. TURQUIE. [REPORTS ON THE ACTIVITIES OF NATIONAL POPLAR COMMISSIONS FOR 1958: TURKEY.] [Docum.] 10th Sess. Int. Poplar Comm., Italy 1959 No. FAO/CIP/95-N, 20 pp. [F.] [Cf. Eren, 1957 and 1958, this subject classification.]

1959. RAPPORTS D'ACTIVITES DES COMMISSIONS NATIONALES DU PEUPLIER. REPUBLIQUE ARABE UNIE: REGION SYRIENNE. [REPORTS OF THE ACTIVITIES OF THE NATIONAL POPLAR COMMISSIONS: SYRIA.] [Docum.] 10th Sess. Int. Poplar Comm., 1959 No. FAO 591715626, 8 pp. [F.]

Populus euphratica was successfully propagated from cuttings without special treatment. Some information on pests and on the areas under various poplars is given.

1959. INFORMES SOBRE LAS ACTIVIDADES DE LAS COMISIONES NACIONALES DEL CHOPO, PERIODO: 1958. ARGENTINA. [REPORTS OF THE ACTIVITIES OF THE INTERNATIONAL POPLAR COMMISSIONS FOR THE PERIOD 1958. ARGENTINA.] [Docum.] 10th Sess. Int. Poplar Comm. No. FAO/CIP/95-L, 5 pp. [Span.]

Jobling, J. 1957. REPORTS OF THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS. UNITED KINGDOM. [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-D, 10 pp. [E.] A summary of the work of the last 10 years.

and Peace, T.R. 1956. PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS FOR THE YEAR 1955: UNITED KINGDOM. [Pap.] Int. Poplar Comm. No. FAO/CIP/82-E, 9 pp. With an appendix on the growing of willows for timber in the United Kingdom.

Johnsson, H. 1956. PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS: SWEDEN. [Pap.] Int. Poplar Comm. No. FAO/CIP/82-G, 1 pp. [E.]

1957. REPORTS OF THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS. SWEDEN. [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-E, 7 pp. 9 refs. [E.] Covering research and breeding over the last 10 years.

Kittani, H. 1957. REPORTS OF THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS. IRAQ. [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/186-L, 7 pp. 5 refs. [E.] Contains data on plantings and outturn of pulpwood and fuelwood, pests and diseases, and native or introduced species and varieties, including a description of *P. euphratica*.

Marion, J. 1958. UN EXAMPLE SPECTACULAIRE DE DEVELOPEMENT REGIONAL DES RESSOURCES ENBOIS: LA POLITIQUE DE PRODUCTION LIGNEUSE DE LA SOCIETE CARTIERE BURGO DANS LA VALLEE DU PO. [A SPECTACULAR EXAMPLE OF REGIONAL DEVELOPMENT OF TIMBER RESOURCES: THE WOOD-PRODUCTION POLICY OF THE CARTIERE BURGO COMPANY IN THE PO VALLEY.] Le Feuillu Francais de Papeterie, Paris. 20 pp. [F.]

Gives an account of the foundation, by a commercial firm (the Cartiere Burgo), of the Istituto di Pioppicoltura at Casale Monferrato for research into poplar cultivation in N. Italy, the results of research to date, and the economics of poplar growing for pulp production.

Muller, R. 1958. DAS WISSENSCHAFTLICHE INSTITUT DES DEUTSCHEN PAPPELVEREINS IN BRUHL BEI KOLN. [THE RESEARCH INSTITUTE OF THE GERMAN POPLAR SOCIETY, BRUHL/COLOGNE.] Forst- u. Holzw. 13(5): 98-9. 4 refs. [G.]

Briefly reviews the Institute's work, particularly on the clear distinction of varieties. In future it will also include comprehensive trial plantings, phenological, morphological, and resistance tests with different varieties, and the breeding of improved varieties.

Sanz-Pastor, M.J.M. 1956. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES POUR L'ANNEE 1955. ESPAGNE. [REPORTS ON THE ACTIVITIES OF THE NATIONAL [POPLAR] COMMISSIONS, 1955. SPAIN.] [Pap.] Int. Poplar Comm. No. FAO/CIP/82-F, 7 pp. 18 refs. [F.]

[Spain: Corn. Nac. Chopo] 1957. MEMORIA 1957. [REPORT FOR 1957.1 Mem. Corn. Nac. Chopo, Madrid 1957. 122 pp. 4 pp. refs. [Span.]

A report in four parts: (1) Work of the Spanish National Poplar Commission in 1957, including 5-year plans of work and research,

and a review of the present situation and possibilities for expansion in eight provinces, (2) projected work for 1958, (3) Spanish legislation governing the cultivation and exploitation of poplars, and (4) a list of Spanish publications on poplar up to the time of the report.

[1960.] [REPORT OF WORK DURING 1960.1 Mem. Corn. Nac. Chopo, Madrid. 10 pp. [F.]

Includes reports by this National Commission on progress in breeding, pest and disease control, and pulping experiments with poplar.

1961. [NATIONAL [POPLAR COMMISSION] REPORT ON ACTIVITIES RELATIVE TO THE EXPLOITATION AND UTILIZATION OF POPLARS AND WILLOWS.] Mem. Corn. Nac. Chopo, Madrid 1961. 13 p. [F.]

Deals mainly with poplar and includes reports on exploitation, breeding trials, the occurrence of insect pests, results of strength tests and pulping trials, and weed control in plantations.

Velay, L. 1957. RAPPORTS D'ACTIVITE DES COMMISSIONS NATIONALES. FRANCE. HISTORIQUE ET FONCTIONNEMENT DE LA COMMISSION. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. FRANCE. HISTORY AND FUNCTIONS OF THE COMMISSION.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-B Add. 1, 10 pp. 5 refs. [F.]

Covers briefly the organization of research and research projects for the last 10 years.

946.1

Gaillard, E. 1956. LA COMMUNAUTE SUISSE DU PEUPLIER. [THE SWISS POPLAR ASSOCIATION.] Schweiz. Z. Forstw. 107 (8/9): 441-3. [F.]

Notes on its membership, aims, and organization.

97 INTERNATIONAL FOREST POLICY AND OTHER INTERNATIONAL COLLABORATION

971 CONGRESSES AND CONFERENCES

Burger, F. W. 1958. INTERNATIONAAL POPULIEREN CONGRES TE PARIJS 16 APRIL TOT MEI 1957. [INTERNATIONAL POPLAR CONGRESS, PARIS 1957.1 Ned. Boschb.-Tijdschr. 30(1): 2-6. [Du.]

Brief reports on the congress as a whole and on the work of the different sections.

Heimbürger, C. 1952. THE FOURTH INTERNATIONAL POPLAR CONGRESS IN GREAT BRITAIN AND FOREST TREE BREEDING IN DENMARK. For. Chron. 28(3): 6-23.

Hellinga, G., and Broekhuizen, J. T. M. 1958. VERSLAG VAN DE EXCURSIES GEORGANISEERD IN HET KADER "AN HET ZESDE INTERNATIONALE POPULIERENCONGRES TE PARIJS "AN 16 APRIL TOT 1 MEI 1957. [REPORT ON THE EXCURSIONS ORGANIZED IN THE FRAMEWORK OF THE 6TH INTERNATIONAL POPLAR CONGRESS, PARIS 1957.1 Ned. Boschb.-Tijdschr. 30(1): 7-21. [Du.]

Herbignat, A. 1951. QUATRIEME CONGRES INTERNATIONAL DU PEUPLIER: CINQUIEME SESSION ANNUELLE DE LA COMMISSION INTERNATIONALE DU PEUPLIER. [FOURTH INTERNATIONAL POPLAR CONFERENCE: FIFTH ANNUAL SESSION OF THE INTERNATIONAL POPLAR CONFERENCE.] Bull. Soc. For. Belg. 58(12): 497-546. [F.]

Includes short abstracts of some of the papers presented to the Congress.

Houtzagers, G., and Burger, F. W. 1951. HET INTERNATIONALE POPULIEREN CONGRES IN ENGELAND. [THE INTERNATIONAL POPLAR CONGRESS IN ENGLAND.] Ned. Boschb.-Tijdschr. 23(7/8): 210-9. [Du.]

Describes some of the less usual varieties and hybrids seen, and discusses the cultivation of the cricket bat willow and the manufacture of cricket bats.

[Hungary: Erdesz. Kutatas.] 1957. NYARFA-KONFERENCIA. [REPORT ON THE POPLAR CONFERENCE.] Erdesz. Kutatas., Budapest 1957(1/2): 3-18. [Hu.]

Held 23-29 Sept. 1956 by arrangement with the Hungarian Academy of Sciences, and attended by delegates from the USSR, Bulgaria, China, E. Germany, Korea, Rumania, and also Austria and Belgium.

[International: FAO] 1952. REPORT OF THE 5TH SESSION OF THE INTERNATIONAL POPLAR COMMISSION AND PROCEEDINGS OF THE 4TH INTERNATIONAL POPLAR CONGRESS. FAO, Rome. 68 pp.

1953. REPORT OF THE 6TH SESSION OF THE INTERNATIONAL POPLAR COMMISSION, 1952. FAO, Rome. 74 pp.

[International: FAO/Int. Poplar Comm.] 1950. REPORT OF THE 4TH SESSION OF THE INTERNATIONAL POPLAR COMMISSION. FAO, Palais des Nations, Geneva. 33 pp.

Contains inter alia proposals on the nomenclature of the section Aigeiros, notes on field trips in France and Switzerland, notes on a poplar timber study in Switzerland, and observations on poplar growing in Iraq, Syria, and the Lebanon.

1953. LA SECONDA SESSIONE DELLA COMMISSIONE INTERNAZIONALE DU PEUPLIER DAL 20 AL 28 APRILE 1948. [THE SECOND SESSION OF THE INTERNATIONAL POPLAR COMMISSION 20-28 APRIL 1948.] Ente Nazionale per la Cellulosa e per la Carta, Rome. 247 pp.

1954. REPORT OF THE NEAR EAST POPLAR CONFERENCE (DAMASCUS, SYRIA 5-9 APRIL 1954). FAO, Rome. No. FAO/CIP/72, 35 pp.

Includes recommendations by the conference on policy, identification and cultivation, logging and utilization, sample forms relating to identification, cultivation and use and to measuring wood samples at time of felling, and a paper. Information gathered on the study tour (J. Pourtet), on poplars and other tree species in Syria and the Lebanon.

1954. REPORT OF THE 7TH SESSION OF THE INTERNATIONAL POPLAR COMMISSION: GERMANY, MAY 1953. FAO, Rome. 85 pp.

Includes reports on poplar identification, cultivation, diseases and pests based on a study tour in Western Germany; also notes on nomenclature—see Guinier, 1954, and Peace, 1954, both listed in Populus sp., 176.1.

1956. REPORT OF THE 8TH SESSION OF THE INTERNATIONAL POPLAR COMMISSION, SPAIN, APRIL-MAY 1955. FAO, Rome. No. FAO/CIP/81, 85 pp.

1957. RAPPORT DE LA CONFERENCE REGIONALE DU PEUPLIER POUR L'AMERIQUE LATINE, BUENOS AIRES, 1957. [REPORT OF THE LATIN AMERICAN POPLAR CONFERENCE, BUENOS AIRES, 1957.] [Docum.] Int. Poplar Comm. No. FAO/CIP/84, 36 pp. 56 refs. [F.]

Contains recommendations on sites, planting techniques, varieties, utilization, etc., and research needs, with annexed papers on fungus diseases (C. Jauch), insect pests (J. A. Pastrana) and identification (A. Ragonese) of poplars and willows in Argentina, the last dealing more particularly with the natural hybrids of *Salix humboldtiana* and exotic willows (*Salix* × *argentinensis*).

Mendes, J. L. 1962. [REPORT ON] THE 11TH SESSION OF THE INTERNATIONAL POPLAR COMMISSION. Estud. Inform. Serv. Flor. Aquic. Portugal No. 171-G 2, 25 pp. [Port.]

Peace, T. R. 1956. INTERNATIONAL POPLAR COMMISSION, 12TH SESSION OF THE PERMANENT EXECUTIVE COMMITTEE, BRUSSELS 24-28 JULY, 1956. REPORT BY U.K. DELEGATE. FAO National Committee Secretariat, London. 6 pp." Restricted.

[Spain: Minist. Agric.] 1955. VIII. SESION DE LA COMISION INTERNACIONAL DEL CHOPO EN ESPANA. [EIGHTH SESSION OF THE INTERNATIONAL POPLAR COMMISSION IN SPAIN.] Ministerio de Agricultura, Patrimonio Forestal de Estado, Madrid. 460 pp. [Span.F.E.]

POPULUS: SECTION AIGEIROS

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

165.3

Larsen, C. M. 1963. [POPLAR BREEDING WITH SPECIAL REFERENCE TO THE SECTION AIGEIROS.] [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63/-2b/9, 8 pp. [F.f.] General considerations on provenance trials, choice of parents, heterosis, polyploidy, etc.

165.62

Maisenhelder, L. C. 1961. SELECTION OF POPULUS CLONES FOR SOUTHERN BOTTOM LANDS. Proc., 6th Sth. Conf. For. Tree. Impr., pp. 110-5. 13 refs.

168 HISTOLOGY

Chardenon, J., and Taris, B. 1960. RECHERCHE SUR LA REPRISE DE L'ACTIVITE DU CAMBIUM DE CULTIVARS DE POPULUS, CULTIVE IN VITRO. [STUDIES ON THE RESUMPTION OF CAMBIAL GROWTH OF POPULUS CULTIVARS GROWN IN VITRO.] C. R. Acad. Sci., Paris 251(1): 120.1. [F.]

Results (tabulated) of studies on three cultivars of *P. × canadensis* and one of *P. deltoides* showed that in favorable conditions the resumption of cambial growth is independent of season. Proliferation was pronounced in May-June and October-November. Some difference between the cultivars was found.

176.1

Bugala, W. 1956. TOPOLE POLNOCNO-AMERYKANSKIE SEKCJI AIGEIROS DUBY I ICH WPPLYW NA UPRAWY TOPOLI W EUROPIE. [NORTH AMERICAN POPLARS OF THE SECTION AIGEIROS AND THEIR INFLUENCE ON THE CULTIVATION OF POPLARS IN EUROPE.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 11: 225-61. 30 refs. [Pol.russ.e.]

181.8

Broekhuizen, J. T. M. 1962. [THE GROWTH RHYTHM OF POPLARS.] Ned. Boschb.-Tijdschr. 34(10): 368-75. 8 refs. [Du.due.]

Tucovic, A. 1956. VAZNOST POZNAVANJA FENOLOGIJE CRNIH TOPOLA U NASOJ ZEMLJI ZA NJIHOVO DETERMINISANJE. [THE PHENOLOGY OF BLACK POPLARS IN YUGOSLAVIA AS A GUIDE TO IDENTIFICATION.] Sumarstvo 9(4/5): 251-7. 6 refs. [Croat.e.g.] [Cf. Tucovic, 1954, *P. lasiocarpa* to *P. nigra* and vars., 181.8.]

Gives a key based on sex and flushing date (in Belgrade and its environs), supplemented by some other characters. Includes *P. nigra* var. *pyramidalis*, *P. deltoides*, × *P. robusta*, × *P. marilandica*, *P. virginiana*, × *P. brabantica*, × *P. regenerata*, × *P. gelrica*, and × *P. serotina*.

2 SILVICULTURE

232.32

Peres, A. de Brito. 1962. [BEHAVIOR OF SOME HYBRID POPLARS IN THE MEALHADA FOREST NURSERY.] Estud. Inform. Serv. Flor. Aquic. Portugal No. 172-A 3, 23 pp. [Port.]

Presents information on the nursery soils and methods and costs

of raising plants, and gives figures for height and diameter growth of eight cultivars of *Populus* × *'canadensis'* and of *P. deltoides* cv. "Missouriensis."

Pourtet, J. 1963. QUELQUES REGLES POUR LA CULTURE DES PEUPLIERS NOIRS EN PEPINIERE ET LEUR MISE EN PLACO. [SOME RULES

FOR THE RAISING OF BLACK POPLARS IN THE NURSERY AND THEIR PLANTING OUT.] Rev. For. Franc. 1953(3): 352-9. [F.]

232.328.5

Braun, H. J. 1962. [SUITABLE GRAFTING PERIODS FOR WOODY PLANTS.] Allg. Forst- u. Jagdztg. 133(11) : 256-9. 23 refs. [G.g.e.]

263 IRRIGATED FORESTS

Regueral, A. G. 1955. LOS CHOPOS EN LOS NUEVOS REGADIOS DE ESPAÑA. [POPLARS IN THE NEW IRRIGATION AREAS OF SPAIN.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-K Add. 9, 8 pp. [Span.]

Gives some preliminary information on irrigated plantations of *poplar* ($\times$ *Populus regenerata*, $\times$ *P. serotina*, *P. deltoides* var. *missouriensis*, and *P. nigra*) established in recent years in various parts of Spain.

27 1 ARBORETA

Bugala, W. 1956(1957). KOLEKCJA TOPOLI W ARBORETUM KORNICKIM. CZESC II. SEKCJA AIGEIOS DUBY - TOPOLE CZARNE. [THE POPLARS IN KORNIK ARBORETUM. II. SECTION AIGEIOS.] Arbor. Kornickie, Poznan No. 2: 79-113. 53 refs. [Pol.e.russ.] The collection contains 26 species, varieties, and hybrids.

4 FOREST INJURIES AND PROTECTION

443.3

Stuart, B. E. St. L. 1954. POPLAR CANKER AND FROST. J. Oxf Univ. For. Soc. (Ser. 4) No. 2: 13-7.

444 VIRUS DISEASES

Berg, T. M. 1962. SOME CHARACTERISTICS OF A VIRUS OCCURRING IN POPLARS. Nature, Lond. 194(4835): 1302-3. 5 refs.

5 FOREST MENSURATION

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Pourtet, J., and Turpin, P. 1954. LE POULETUM NATIONAL DE VINEUIL (LOIR-ET-CHER). [THE NATIONAL POULETUM OF VINEUIL

(LOIR-ET-CHER).] Rev. For. Franc. 6(1) : 9-18. [F.] Describes the soil, Layout, etc.; of the arboretum and also gives some figures for increment of various hybrids (*P. serotina*, *P. robusta*, *P. regenerata*) and of *P. deltoides*.

8 FOREST PRODUCTS AND THEIR UTILIZATION

81 1.52

Meiden, H. A. van der. 1958. KERNHOUT BIJ POPULIEREN EN ZIJN PRAKTISCHE BETEKENIS. [HEARTWOOD OF POPLARS AND ITS PRAC-

TICAL IMPORTANCE.] Korte Meded. Bosbouwproefsta., Wageningen No. 32, 6 pp. [D.u.e.] (Repr. from Houtwereld Oct. and Dec. 1957, and Jan. 1958.)

POPULUS: SECTION TACAMAHACA

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

176.1

Rouleau, E. 1949. LES POPULUS DE LA SECTION TACAMAHACCA EN AMERIQUE. [POPULUS OF THE SECTION TACAMAHACCA IN AMERICA.] Annales de l'ACFAS, Montreal 15: 106. [F.] The section in America contains three spp. and five varieties. The species hybridize easily with those of the section *Aegirus* and have produced five hybrids.

Tkacenko, V. I. 1962. [NEW SPECIES OF PLANTS IN THE COLLECTION OF THE FRUNZE BOTANICAL GARDEN.] Bjull. Glavn. Bot. Sada, Moskva No. 45: 55-9. [Russ.latin]

Describes *Populus tianschanica* and *Lonicera sovetkinae* spp. nov. (in Russian and Latin), and *P.t. var. microphyll* var. nov. (in Russian only).

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Joachim, H. F. 1957. BEOBACHTUNGEN UND UNTERSUCHUNGEN AN BALSAMPAPPELN. [OBSERVATIONS AND INVESTIGATIONS ON BALSAM POPLARS.] Wiss. Abh. Dtsch. Akad. Landw. Berlin No. 2'7 (Beitr. Pappelforsch. No. 2): 35-73. 77 refs. [G.g.]

2 SILVICULTURE

232.1 1

Bugala, W. 1957(1958). POLNOCNOAMERYKANSKIE TOPOLE SEKCJI TACAMAHACA SPACH I ICH UPRAWA W EUROPIE. [N. AMERICAN POPLARS OF THE TACAMAHACA SECTION IN EUROPE.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 12: 359-81. 15 refs. [Pol.russ.e.]

271 ARBORETA

Bugala, W. 1959. KOLEKCJA TOPOLI W ARBORETUM KORNICKIM. CZESC III. [THE POPLAR COLLECTION AT THE KORNIK ARBORETUM. III.] Arbor. Kornickie, Poznan No. 4: 123-63. 26 refs. [Pol.russ.e.e.] The collection contains 12 species and 12 hybrids in Section *Tacamahaca*, and 3 species in Section *Leucoides*. All are described with notes on performance.

4 FOREST INJURIES AND PROTECTION

416.1

Dance, B. W. 1961. LEAF AND SHOOT BLIGHT OF POPLARS (SECTION TACAMAHACA SPACH) CAUSED BY VENTURIA POPULINA (VUILL.)

FABRIC. Canad. J. Bot. 39: 875-90. 25 refs. (Contr. For. Biol. Div. Dep. For. Can. No. 706.)

8 FOREST PRODUCTS AND THEIR UTILIZATION

892.52

Dull, G. G. 1957. THE INVESTIGATION OF CERTAIN ANTIBACTERIALS IN POPULUS TACAMAHACA MILL. AND HYPERICUM PROLIFICUM.

Abstr. of thesis, in Dissert. Abstr. 17(7): 1453.
Two *sesquiterpene* alcohols isolated from the buds of *P. tacamahaca* showed activity in vitro against *Mycobacterium tuberculosis*.

POPULUS: SECTION LEUCE

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

164.6

Bartkowiak, S. 1957/1958. PRZYSADKI KWIATOWE U TOPOLI SEKCJI LEUCE DUBY. [BRACTEOLES IN POPLARS OF THE SECTION LEUCE.] Arbor. Kornickie, Poznan No. 3: 221-36. 8 refs. [Pol.e.russ.] Describes, with illustrations, the differences in the shape of bracteoles of male and female flowers of *Populus alba*, *P. tremula*, *P. canescens*, and *P. tremuloides*.

1961. BIOMETRYCZNA CHARAKTERYSTYKA PRZYSADKI KWIATOWYCH TOPOLI SEKCJI LEUCE DUBY. [BIOMETRIC INVESTIGATION OF BRACTEOLES OF POPLARS OF SECTION LEUCE.] Arbor. Kornickie, Poznan 6: 117-30. 4 refs. [Pol.russ.e.e.] Presents, in tables and graphs, the results of biometric studies on floral bracteoles of poplars in section *Leuce*.

164.9

Larsen, C. M. 1954. ETUDE RELATIVE AUX VARIATIONS DE LA GRANDEUR DES STOMATES DANS LE GENRE POPULUS. [VARIATIONS IN THE SIZE OF STOMATA IN THE GENUS POPULUS.] [Pap.] 8th Int. Bot. Congr. Paris, Sect. 13: 26-7. [F.]

165.3

[Canada: Ont. Dep. Lds. For.] [1957?] ASPEN POPLARS. Rep. Ont. Dep. Lds. For. 1956/1957, Sect. No. 10(6).

165.41

Bouvarel, P., and Lemoine, M. 1959. HYBRIDATION DES TREMBLES ET PEUPLIERS BLANCS A LA STATION DE RECHERCHES DE NANCY. [HYBRIDIZATION OF ASPENS AND WHITE POPLARS AT THE RESEARCH STATION AT NANCY.] Rev. For. Franc. 11(10): 679-98. 8 refs. [F.]

Grehn, J. 1952. DASSAMENGEWICHT BEI KREUZUNGEN INNERHALB DER SEKTION POPULUS LEUCE ALS FUNKTION DES WEIBLICHEN UND MANNLICHEN PARTNERS. [SEED WEIGHT IN CROSSES WITHIN POPULUS SECTION LEUCE AS A FUNCTION OF THE MALE AND FEMALE PARENTS.] Z. Forstgenet. 2(1): S-16. Numerous refs. [G.g.e.]

1952. UBERSPALTUNGSERSCHINUNGEN UND PHOTOPERIODISCHE EINFLUSSE BEI KREUZUNGEN INNERHALB DER SEKTION POPULUS LEUCE DUBY. [SEGREGATION AND PHOTOPERIODIC INFLUENCES IN CROSSES WITHIN THE POPULUS SECTION LEUCE.] Z. Forstgenet. 1(3): 61-9. 20 refs. [G.g.]

1953. SAMENENTWICKLUNG UND JUGENDWACHSTUM BEI KREUZUNGEN IN DER SEKTION POPULUS LEUCE. [SEED DEVELOPMENT AND SEEDLING GROWTH OF CROSSES WITHIN POPULUS SECTION

LEUCE.] Proc., Congr. Int. Union For. Res. Organ., Rome 1953 [Pre-issue], Section 22 (No. 3), 7 pp. 6 refs. [G.g.]

Janson, L. 1960. PROBA ANALIZY STATYSTYCZNEJ CECH MORFOLOGICZNYCH U MIESZANCOWEGO POTOMSTWA TOPOLI PRZY ZASTOSOWANIU METODY WANKEGO. [STATISTICAL ANALYSIS OF THE MORPHOLOGICAL CHARACTERS OF POPLAR HYBRID PROGENY BY WANKE'S METHOD.] Prace Inst. Bad. Lesn. No. 195: 3-29. 2 refs. [Pol.russ.e.]

Schonbach, H. 1957. DIE BISHERIGEN ERGEBNISSE DER ZUCHTUNGSARBEITEN MIT VERSCHIEDENEN PAPPELARTEN DER SEKTION LEUCE. [BREEDING TRIALS WITH POPLARS OF THE SECTION LEUCE. RESULTS TO DATE.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 27 (Beitr. Pappelforsch. No. 2): 149-78. 22 refs. [G.g.]

Seitz, F. W. 1963. [BREEDING OF POPLARS OF THE SECTION LEUCE.] Holz-Zbl. 89(41): 623-4. 7 refs. [G.] Briefly discusses published results, along with some not yet published in detail, of extensive crossing and selection at Schmalenbeck, referring to a very promising *P. tremula* × *P. tremuloides* hybrid which showed excellent height growth in N. and S. Germany, triploid progeny of a grey poplar [cf. Seitz, 1954, *P. alba* to *P. bachofeni*, 165.41], etc.

Violen, H. van. 1954. JEUGDGROEI VAN NAKOMELINGSCHAPPEN "IT KRUISINGEN MET LEUCE-POPULIEREN, EEN GENERATIEVE TOETSING "AN DAARBIJ GEBRUIKTE OUDERS. [JUVENILE DEVELOPMENT OF PROGENIES FROM CROSSES BETWEEN POPLARS OF THE SECTION LEUCE, A BREEDING TEST OF THE PARENT TREES.] T.N.O.-Nieuws, 's Gravenhage No. 99: 195-200. (Reprinted as Korte Meded. Bosbouwproefsta. T.N.O., Wageningen No. 22. 1954. 6 pp.) 2 refs. [Du.e.]

176.1

Frohlich, H. J., and Baumeister, G. 1963. [METHODS OF IDENTIFYING POPLARS OF THE SECTION LEUCE.] Forstarchiv 34(10): 245-52. 4 refs. [G.g.]

From study of many clones of *Populus alba*, *P. × canescens* and *P. tremula* presents descriptions and identification keys based on morphological, color, and physiological characteristics. The method is similar to that for black-poplar identification [see Muller and Sauer, 1958, *P. canadensis* to *P. davidiana*, 176.1], but takes additional leaf and petiole characteristics into account.

[Germany: Forst- u. Holzw.] 1962. SONDERHEFT PAPPEL. [SPECIAL NUMBER: POPLARS.] Forst- u. Holzw. 17(12): 225-44. 28 refs. [G.]

Kobendza, R. 1952. TOPOLESEKCJI LEUCE DUBY W POLSCE. [POPLARS OF THE SECTION LEUCE IN POLAND.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 8: 32-98. 2 refs. [Pol.russ.e.]

Marcel, E. 1961. TAXONOMISCHE UNTERSUCHUNGEN IN DER SEKTION LEUCE DUBY DER GATTUNG POPULUS L. [TAXONOMIC INVESTIGATIONS OF THE SECTION LEUCE OF THE GENUS POPULUS.] Mitt. Schweiz. Anst. Forstl. Versuchsw. 37(4): 269-321. 53 refs. [G.g.f.it.e.]

181.32

Wilde, S. A., and Paul, B. H. 1951. RATE OF GROWTH AND COMPOSITION OF WOOD OF QUAKING AND LARGETOOTH ASPEN IN RELATION TO SOIL FERTILITY. Trans., Wisc. Acad. Sci., Arts & Letters, Madison 40(2): 245-50. 7 refs.

181.521

Larsen, C. M. 1953. FORMATION SPONTANEO DE FLEURS SUR DE JEUNES TREMBLES. [SPONTANEOUS FLOWERING OF YOUNG ASPENS.] Bull. Soc. For. Belg. 60(10): 448-58. 3 refs. [F.]

Lester, D. T. 1961. OBSERVATIONS ON FLOWERING IN THE ASPENS. Proc., 8th Northeast. For. Tree Impr. Conf., New Haven, Conn. 1960: 35-8.

181.8

Schlatzer, G. 1963. SOME OBSERVATIONS ON FOLIATION PHENOMENON. 4 IN ASPENS. Arsskr. Vet.-Landbohøjsk. 1963: 119-30. 11 refs. [E.e.]

Observations in 1959-62 on irregular foliation patterns, in which the bursting of one or more buds of a single shoot is delayed or accelerated compared with that of the immediate neighbors, on one or more shoots of Populus tremula, P. tremuloides and their hybrids, suggest that the irregularities may be connected with insufficiently low temperatures during dormancy.

2 SILVICULTURE

232.1

Martinez Mata, M. 1959. SECCION DE GENETICA FORESTAL. NOTA SOBRE LA SECCION LEUCE. [SECTION FOR FOREST GENETICS. NOTE ON [POPLARS OF] THE SECTION LEUCE.] An. Inst. For. Invest. Exp., Madrid 31(4): 21-4. [Span.] Comments are presented on the suitability of Populus tremula, P. tremuloides, P. grandidentata, P. alba, P. alba var. bolleana, and P. × canescens for cultivation in Spain. Particular reference is made to P. × canescens, its origin, characteristics, and suitability for Spain.

232.12/13

Church, T. W., Jr. 1963. SURVIVAL AND GROWTH OF 12-YEAR HYBRID ASPEN COMPARED TO NATIVE WISCONSIN STOCK. U. S. For. Serv. Lake St. For. Exp. Sta. Res. Note No. LS-22, 2 pp. 2 refs.

Pauley, S. S. 1963. PERFORMANCE OF SOME ASPEN SEED SOURCES AND HYBRIDS IN EASTERN MASSACHUSETTS. [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63/-2b/2, 17 pp. 17 refs.

Johnson, A. G., and Santamour, F. S., Jr. 1963. RESULTS OF ASPEN SCREENING TESTS. I, II, III, IV. Minn. For. Notes Nos. 136-139. Each 2 pp. 5 refs.

232.3

Benea, V. 1961. PRODUCEREA DIN SEMINTE A PUIETILOR DE POPULUS ALBA L., × POPULUS CANESCENS SMITH. SI POPULUS TREMULA L. [RAISING P. ALBA, × P. CANESCENS, AND P. TREMULA FROM SEED.] Rev. Padurilor 76(8): 455-9. 27 refs. [Rum.russ.g.f.e.] Notes on harvesting, storage, treatment, and sowing of seed, and protection of the seedlings.

232.312

Spalek, V. 1950. JAK PESTOVAT TOPOLY ZE SEMEN. [HOW TO RAISE POPLARS FROM SEED.] Sborn. Csl. Akad. Zemed. 22(3/5): 523-32. 3 refs. [Cz.russ.e.]

232.323.2

Marjai, Z. 1960. A MYAR-MAGCSEMETE NOVEKEDESE, FEJLODESE ES KIVALASZTODASA. [GROWTH AND NATURAL SELECTION OF POPLAR SEEDLINGS OF THE SECTION LEUCE.] Erdesz. Kutatas, Budapest 56(1/3): 233-53. 14 refs. [Hu.hu.russ.g.e.]

232.328

Pesina, K. 1962. [VEGETATIVE PROPAGATION OF POPLARS OF SECTION LEUCE BY WINTER CUTTINGS AND BY LAYERS.] Lesnictvi, Praha 8(12): 957-74. 27 refs. [Cz.cz.russ.e.f.]

Describes trials with stem cuttings, root cuttings, and layers, of eight different species, varieties, and hybrids.

Suszka, B. 1958. WEGETATYWNE ROZMAZANIE TOPOLI Z SEKCJI LEUCE DUBY. [VEGETATIVE PROPAGATION OF POPULUS SECTION LEUCE.] Sylwan 102(3): 66-77. 22 refs. [Pol.] A review of literature, mostly German.

232.328.1/2

Janson, L. 1962. [A NEW METHOD OF PROPAGATING POPLARS OF SECTION LEUCE.] Sylwan 106(5): 19-27. 10 refs. [Pol.russ.e.] The method is to take root cuttings 2-6 mm. thick and 5 cm. long, which will root and produce shoots in the same year; these shoots can then be taken as stem cuttings to form extra stock, without impairing the original root cuttings. By leaving a part of each root cutting above the soil, they remained healthier and could assimilate.

232.328.1/3

Kuchlenz, F. 1958. UNTERSUCHUNGEN UBER DIE GUNSTIGSTE WURZELSTECKLINGSLANGE UND -STARKE BEI DER VEGETATIVEN VERMEHRUNG VON PAPPELN DER SECTION LEUCE DURCH WURZELSTECKLINGE. [STUDY ON THE OPTIMUM LENGTH AND THICKNESS OF ROOT CUTTINGS IN VEGETATIVE PROPAGATION OF POPLARS OF THE SECTION LEUCE.] Zuchter 28(7): 336-43. 6 refs. [G.g.]

Suzka, B. 1959. MNOZENIE TOPOLI Z SEKCJI LEUCE DUBY Z SADZONEK ZIELNYCH UZYSKANYCH PRZEZ PODPEDZANIE KORZENI. [PROPAGATION OF POPULUS SECTION LEUCE BY SHOOTS FROM FORCED ROOT CUTTINGS.] Sylwan 103(9): 45-57. 8 refs. [Pol.russ.e.]

232.329.6

Vaage, T., and Borresen, E. 1962. INTERIM REPORT ON TESTS WITH JIFFY-POTS IN FORESTRY. Experimental Research, Jeffy-Pot Ltd., Bergen No. 47, 9 pp. 8 refs. [E.]

271 ARBORETA

Bugala, W. 1955. KOLEKCJA TOPOLI W ARBORETUM KORNIKIM. [THE POPLAR COLLECTION AT THE KORNIK ARBORETUM.] Arbor. Kornickie, Poznan No. 1: 43-59. 53 refs. [Pol.russ.e.] A general outline, with description of 15 species, varieties, and hybrids in the Section Leuce.

1959. KOLEKCJA TOPOLI W ARBORETUM KORNIKIM. CZESC III. [THE POPLAR COLLECTION AT THE KORNIK ARBORETUM. III.] Arbor. Kornickie, Poznan No. 4: 123-63. 26 refs. [Pol.russ.e.e.]

The collection contains 12 species and 12 hybrids in Section Tacamahaca, and 3 species in Section Leucoides. All are described with notes on performance.

4 FOREST INJURIES AND PROTECTION

443.3

Persson-Huppel, A. 1963. ENZYMATIC SPLITTING OF SUCROSE BY SOME STRAINS OF VALSA NIVEA FR. Stud. For. Suec. Skogshogsk, Stockh. No. 7, 29 pp. 34 refs. [E.e.sw.] Bark extracts of Populus tremula, P. tremuloides and the hybrid

varied in contents of sugars, sucrose being absent from the parents. Strains of V. nivea varied considerably in their ability to decompose the sucrose molecule enzymatically and to use the sugar. The relationship between this and pathogenicity is discussed.

8 FOREST PRODUCTS AND THEIR UTILIZATION

81 1.79

Haas, B. R., and Kremers, R. E. 1961. ANALYSIS OF STONE CELLS FROM BIGTOOTH AND QUAKING ASPENS. *Tappi* 44(10):747-8. 8 refs. Chemical analysis showed that the stone cells of *Populus grandidentata* and *P. tremuloides* barks are similar to the wood of these species, and since they were relatively free from the resins, tannins, proteins, and other plant constituents that make the study of bark lignins difficult, they appear to be good starting materials for further studies. [From the authors' summary.]

P. ALBA TO P. BACHOFENI

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

160.29

Kazarjan, V. O., and Avundzjan, E. S. 1956. FERMENTATIVNAJA AKTIVNOSTJ LISTJEV RAZNOVOZRASNYH DEREVJEV I EE IZMENENIE PRI VEGETATIVNOM RAZMNOZENII RASTENII. [LEAF ENZYME ACTIVITY IN TREES OF DIFFERENT AGES, AND CHANGE IN SUCH ACTIVITY AFTER VEGETATIVE PROPAGATION.] *Dokl. Akad. Nauk SSSR* 108(5): 958-61. 15 refs. [Russ.]

165 PHYLOGENY, EVOLUTION, HEREDITY, GENETICS AND BREEDING, VARIATION

Bugala, W. 1951. KILKA NOWYCH ODMIAN I MIESZANCOV POPULUS ALBA L. [SOME NEW VARIETIES AND HYBRIDS OF P. ALBA.] *Acta Soc. Bot. Polon.* 22(1/2): 43-57. 5 refs. [Pol.e.] Describes, with illustrations, examples of *P. alba* var. *angustifolia*, *P. alba* var. *macrophylla*, $\times P. canescens$ var. *pyramidalis*, and $\times P. rogalinensis$ (probably a hybrid *P. tremula* $\times$ *alba*) from the Arboretum at Kornik.

165.3

Johnson, L. P. V. 1946. A NOTE ON INHERITANCE IN F_1 AND F_2 HYBRIDS OF *POPULUS ALBA* L. $\times$ *P. GRANDIDENTATA* MICHX. *Canad. J. Res.* 24th(6): 313-7. Bblg.

165.41

Elorrieta, J. 1957. INFORMES SOBRE LAS ACTIVIDADES DE LAS COMISIONES NACIONALES. ESPANA. INVESTIGACIONES SOBRE LOS CHOPOS CULTIVADOS EN ESPANA. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. SPAIN. RESEARCH ON POPLARS CULTIVATED IN SPAIN.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-F Add. 2, 2 pp. [Span.] Includes a report on heterosis observed in *Populus tremula* $\times$ *P. alba* and *P. tremula* $\times$ *P. alba* var. *boileana* hybrids, in contrast to the experience of W. Wettstein and C. Heimbürger, who obtained poor results with the first combination.

Jablokov, A. S. 1956. PIRAMIDALNYE TOPOLI. [FASTIGIATE POPLARS.] *Goslesbumizdat*, Moscow & Leningrad. 58 pp. [Russ.] Discusses the importance of fastigate poplars for green-belt and street and roadside planting in the U.S.S.R.; their distribution in cultivation; trials in the breeding of quick-growing, frost-hardy varieties; and propagation.

Schlenker, G. 1953. BEOBSACHTUNGEN UBER DIE GESCHLECHTSVERHALTNISSE BEI LUNGENGRAUPAPPELN "ND ASPEN. [SEX DISTRIBUTION IN YOUNG WHITE POPLAR AND ASPEN.] *Z. Forstgenet.* 2 (5): 102-4. 3 refs. [G.e.]

Schonbach, H. 1960. EINIGE ERGEBNISSE ACHTJAHRIGER ZUCHTUNGSVERSUCHE MIT PAPPELARTEN DER SEKTION LEUCE. [SOME RESULTS OF EIGHT-YEAR-OLD BREEDING TRIALS WITH POPLAR VARIETIES OF THE SECTION LEUCE.] *Wiss. Abh. Dtsch. Akad. Landw.-Wiss.*, Berlin No. 44 (Beitr. Pnnpelforsch. No. 4): 7-21. 3 rtf. [G.g.russ.e.] [Cf. Schonbach, 1957, Section Leuce, 165.41.]

dentata and *P. tremuloides* barks are similar to the wood of these species, and since they were relatively free from the resins, tannins, proteins, and other plant constituents that make the study of bark lignins difficult, they appear to be good starting materials for further studies. [From the authors' summary.]

1962. ERGIBT DIE KREUZUNG *POPULUS TREMULA* $\times$ *POPULUS ALBA* (UND REZIPROK) LUXURIERENDE BASTARDE? (EIN BEITRAG ZUM HETEROSISPROBLEM BEI WALDBAUMEN). [DO CROSSES OF *P. TREMULA* AND *P. ALBA* AND RECIPROCAL CROSSES PRODUCE HYBRID VIGOR? (A CONTRIBUTION TO THE PROBLEM OF HETEROSIS IN FOREST TREES.)] *Silvae Genet.* 11(1): 3-11. 26 refs. [G.g.e.f.]

Seitz, F. W. 1954. UBER DEN SELBSTUNGS- UND KREUZUNGSERFOLG BEI VERWENDUNG DES POLLENS DER ZWITTRIGEN GRAUPAPPEL "ON DILLINGEN [RESULTS OF SELFING AND CROSSING USING POLLEN OF THE DILLINGEN ANDROGYNOUS GREY POPLAR.] *Abstr. in Z. Forstgenet.* 3(6): 141. [G.]

1954. UBER DAS AUFTRETEN "ON TRIPLOIDEN NACH DER SELBSTUNG ANOMALER ZWITTERBLUTEN EINER GRAUPAPPELFORM. [THE OCCURRENCE OF TRIPLOIDS AFTER SELF-POLLINATION OF ANOMALOUS ANDROGYNOUS FLOWERS OF A GREY POPLAR.] *Z. Forstgenet.* 3(1): 1-6. 13 refs. [G.g.e.]

Wettstein-Westersheim, W., and Minelli, H. 1962. DIE ZUCHTUNG "ON INTERSEKTIONELLEN PAPPELKREUZUNGEN. [BREEDING INTER-SECTIONAL POPLAR HYBRIDS.] *Allg. Forstztg.* 73(11/12), Suppl. (Informationsdienst No. 57). 2 pp. [G.]

Zurbin, A. I. 1951. POVYSENIESKRESCIVA EMOSTIV DVO TO POLEI PRI POMOSCI PREDVARITEL'NOGO VEGETATIVNOGO SBLIZENIJA. [INCREASING THE CAPACITY OF POPLAR SPECIES FOR HYBRIDIZATION BY PREVIOUS GRAFTING [OF ONE PARENT UPON A STOCK OF THE OTHER].] *Priroda*, Moskva 40(4): 66. [Russ.]

165.42

Kopecky, F. 1960. EXPERIMENTELLE ERZEUGUNG "ON HAPLOIDEN WEISSPAPPELN (*POPULUS ALBA* L.) [EXPERIMENTAL PRODUCTION OF HAPLOID WHITE POPLARS.] *Silvae Genet.* 9(4): 102-5. 27 refs. [G.g.e.f.]

1960. HAPLOID *POPULUS ALBA* L. KISERLETI ELOALITASA. [EXPERIMENTAL PRODUCTION OF HAPLOIDS IN *POPULUS ALBA*.] *Erdesz. Kutatas.*, Budapest 56(1/3): 151-8. 26 refs. [Hu.hu.russ.g.e.]

165.5

Anonymous. 1932. DIFFERENT GROWTH HABITS OF MALE AND FEMALE *P. ALBA*. *Mitt. Dtsch. Dendrol. Ges.* 44: 384.

Vojtus, M. 1961. NIEKTORYCH TYPOCH BIELYCH TOPOL'OV (*POPULUS ALBA* L. A *POPULUS CANESCENS* S.M.) V PODUNAJSKYCH LUZNYCH LESOCH CSSR. [SOME TYPES OF WHITE POPLARS (*P. ALBA* AND *P. CANESCENS*) IN THE DANUBE FLOOD-PLAIN FORESTS OF CZECHOSLOVAKIA.] *Lesn. Cas.* 7(3): 161-74. 8 refs. [Slovak.russ.g.]

165.71

Catalan, G. 1963. [CROSSES WITHIN THE SECTION LEUCE AND A NOTABLE HYBRID BETWEEN LEUCE AND AIGEIROS.] [Pap.] *FAO World Consult. For. Genet.*, Stockh. 1963 No. FAO/FORGEN 63-2b/8, 3 pp. [Span.span.]

Einspahr, D. W. 1962. EUROPEAN WHITE POPLAR-BIGTOOTH ASPEN HYBRID IN WISCONSIN. J. For. 60(5): 345. 3 refs.
Describes a natural hybrid developed under fairly open conditions on a **moist sandy** site. Height at 17 years was 70 ft., d.b.h. 13.7 in., sp. gr. 0.389, fibre length 0.96 mm., chromosome number 38. **The tree** is bisexual. Sprouts propagated from this tree are being studied.

Little, E. L., Jr., Brinkman, K. A., and McComb, A. L. 1957. TWO NATURAL IOWA HYBRID POPLARS. For. Sci. 3(3): 253-62. 16 refs.

McComb, A. L., and Hansen, N. J. 1954. A NATURALLY OCCURRING ASPEN-POPLAR HYBRID. J. For. 52(7): 528-9.
Cites map references in Iowa for two stands of *Populus grandidentata* × *alba* of good form, rapid growth and apparent disease resistance, for one of which a stand and stock table is given (800 trees and 3,500 cu.ft./acre, 3-9 in. diam., 34-74 ft. with m.a.i. of 145 cu. ft. at 24 yrs., 3-1/2 times as **fast as oak of same age**.

165.72

Saatcioglu, F. 1956. BOZKAVAK (POPULUS CANESCENS SMITH) MELEZINIM SUN'I CAPRAZLAMA METODIYLE ELDE EDILMESI. [ARTIFICIAL PRODUCTION OF POPULUS CANESCENS BY CROSSING.] Istanbul Univ. Orm. Fak. Derg. 6(2):70-91. 13 refs. [Turk.g.g.]
Gives details of the laboratory hybridization and culture of *P. alba* × *P. tremula* and *P. tremula* × *P. alba*, the **early nursery growth** of which was 20% greater than selfed *P. alba*. Leaves of the two crosses and of pure *P. alba* are illustrated.

Scepotjev, F. L. 1954. NOVE GIBRIDNJE FORMY OSINY. [NEW HYBRID FORMS OF ASPEN.] Dokl. Akad. Nauk SSSR 97(1): 161-4. 2 refs. [Russ.]

[Sweden: Foren. Vaxtforadl. Skogstrad] 1955. [RESISTANCE OF POPLAR HYBRIDS TO RUST.] Arsberatt. Foren. Vaxtforadl. Skogstrad 1954: 11. [Sw.]

Among plants at Ekebo where *Mercurialis perennis*, the alternate **host of Melampsora rostrupii**, was abundant, *P. tremuloides* was completely resistant, and *P. tremuloides* × *P. tremula* slightly, *P. tremuloides* × *P. davidiana* moderately, and *P. tremula* × *P. davidiana* very susceptible.

176.1

Anonymous. 1854. A GIANT WHITE POPLAR IN BOHEMIA. Vereinschr. F.-Ju. Naturk 18: 71.

Bugala, W. 1960. KRYTYCZNY PRZEGLAD ODMIAN GEOGRAFICZNYCH I MIESZANCOV POPULUS ALBA L. ORAZ STUDIA NAD TYM GANTUNKIEM W DOLINIE WISLY. [CRITICAL REVIEW OF GEOGRAPHICAL VARIETIES AND HYBRIDS OF P. ALBA, AND STUDIES ON THE SPECIES IN THE VALLEY OF THE VISTULA.] Arbor. Kornickie, Poznan No. 5: 5-138. 92 refs. [Pol.e.russ.e.]

Gambi, G. 1958. IL PIOPPO BIANCO DELLA LUCCHESIA. [THE WHITE POPLARS OF THE LUCCA REGION OF TUSCANY.] Monti e Boschi 9(12): 659-65. [It.f.e.]

Describes the two **local** varieties [*Populus albavars.nivea* and *peronea*], which are much more resistant to insect damage than the hybrid black poplars. and give a satisfactory yield (mean annual yield ea. 20-25 cu.m./ha.). Mixed stands of this poplar and *Alnus glutinosa* are recommended.

Jovanovic, B., and Tucovic, A. 1960. TAKSONOMSKA PROUCAVANJA JASIKE (POPULUS TREMULA L.) ODNOSNO T.Z.V. BAHOFENOVE TOPOLE NA DELIBLATSKOJ PESCARI. [TAXONOMIC STUDIES ON ASPEN (P. TREMULA) WITH REFERENCE TO THE SO-CALLED BACHOFEN POPLAR ON THE DELIBLATO SANDS.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 1: 5-41. 24 refs. [Serb.serb.g.]

Jozami, J.M. [1954?] EL ALAMO "ARNALDO MUSSOLINI" EN LA ARGENTINA. [POPULUS "A.M." IN ARGENTINA.] Gobierno de Entre Rios, Direccion de Agricultura y Colonizacion, Parana, Ministerio de Obras Publicas, Comercio e Industria, Gobierno de Entre Rios, Parana. 16 pp. 32 refs. [Span.]

Notes on the **poplar**, its nomenclature, **silvicultural** characters, cultivation, **growth** in Argentina, diseases in Argentina, and **properties and uses of the wood**.

Merendi, A. 1961. IL GATTICE O PIOPPO BIANCO. [POPULUS ALBA.] Ital. Agric. 98(8): 785-92. 2 refs. [It.]

Describes its **silvicultural** characters, and gives some data on the increment of Italian plantations.

Prosinski, S. 1954. Z BADAN NAD WYODREBNIANIEM MASY CELULOZOWEJ Z DREWNA TOPOLI CZARNEJ I BIALEJ. [INVESTIGATIONS ON THE PULPING OF POPULUS NIGRA AND P. ALBA.] Sylwan 98(3): 229-38. 19 refs. [Pol.pol.]

Von Solemacher-Antweiler. 1936. POPULUS BACHELIERI. Mitt. Dtsch. Dendrol. Ges. 48: 205-7. [G.]

18 PLANT ECOLOGY

Slavnic, z. 1952. O EKOLOGIJI BAHOFENOVE TOPOLE. [ECOLOGY OF POPULUS BACHOFENI.] Sum. List 76(1/3): 35-42. 5 refs. [Croat. croat.g.]

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Anonymous. 1865. NATURAL HISTORY OF P. ALBA. Monatschr. F. & J. 9: 60-61.

181.1

Crahay. 1901. THE P. ALBA IN BELGIUM. Bull. Soc. For. Belg. 8: 342.

Schroter. 1926. DISTRIBUTION OF P. ALBA. Bot. Abstr. 15: 9907.

181.521

Greguss, P. 1932. THE POLLEN OF P. ALBA. Biol. Abstr. 6: 3183.

Sauer, E. 1954. BEOBACHTUNGEN AN ZWITTRIGEN PAPPELN. [OBSERVATIONS ON ANDROGYNOUS POPLARS.] Z. Forstgenet. 3(5): 89-91. 6 refs. [G.g.e.] [Cf. Seitz, 1954, P. alba to P. bachofeni, 165.41.]
A study of the **androgynous flowers** of a young *Populus tremula* at Stuttgart. Mention is also made of the occurrence of androgynous **flowers on an** adult *P. alba* (or possibly *P. alba* × *P. canescens*) and a young *P. candicans*.

181.65

Anonymous. 1922. RAPID GROWTH OF WHITE POPLAR. Bull. Soc. For. Belg. 25: 401.

18 1.69

Enikeev, S. G. 1953. REDKII SLUCAI ESTESTVENNOI PRIVIVKI. [A RARE CASE OF NATURAL GRAFTING.] Priroda, Moskva 42(7): 110. [Russ.]

Of *Populus alba* var. *bolleana* and *Fraxinus potamophila* in *Frunze, Kirgiz S.S.R.*, a branch of the latter having formed a natural graft with the former's **trunk some** 30-40 years ago. [No sections appear to have been taken.]

181.71

Bogdanov, P. L. 1952. BELYI TOPOLJ-VELIKAN. [A GIANT POPULUS ALBA TREE.] Priroda 41(5): 117. [Russ.]

Illustrated description of a 35-m. high, 4.2-m. d.b.h. white poplar tree, probably 120-140 years old, growing in the valley of the **river** Khosta, on the **Black Sea shore of the Caucasus**. The tree seems to have coalesced from three lateral shoots following the destruction of the apical shoot.

182.21

Karpati, I., and Karpati, V. 1958. ELM-ASH-OAK GROVE FORESTS (QUERCETO-ULMETUM HUNGARICUM SOO) TURNING INTO WHITE POPLAR DOMINATED STANDS. Acta Agronomica Academiae Scientiarum Hungaricae, Budapest 8(3/4): 267-83. 66 refs. [E.e.f. russ.]

2 SILVICULTURE

232.1

Anonymous. 1919. WHITE POPLAR AS A SPECIES FOR AFFORESTATION IN FRANCE. *Rev. Eaux For.* 57: 93.

232.1.1

Bispe Lariguet, M. 1958. EL CRECIMIENTO DE POPULUS EURAMERICANA I-154 EN TIERRA FIRME DE LA PROVINCIA DE BUENOS AIRES, ARGENTINA. [GROWTH OF P. EURAMERICANA I-154 ON TERRA FIRMA IN BUENOS AIRES PROVINCE, ARGENTINA.] *Rev. For. Argent.* 2(2): 43-4. [Span.]

232.3 15.2

Füsz, J. 1957. A FEHERNYARMAG TÁROLÁSA. [STORAGE OF SEED OF POPULUS ALBA.] *Erdo* 6(1): 37-9. [Hu.]
From abstr. in *Hung. Agric. Rev.* 6(3): 7. 1957. [E.]

Polya, L. 1961. INJURY BY SOAKING OF POPULUS ALBA SEEDS. *Nature*, Lond. 189(4759): 159-60. 4 refs.
When air-dried seeds stored in closed vessels at +5°C. were soaked for 15, 35, and 60 min. in distilled or tap water, the percent of abnormal seedlings was 40.2, 40.0, and 45.9 vs. 11.8 in controls. The percent of seeds not germinating also rose slightly.

232.32

Dragomir, N., and Duran, v. 1959. CULTURA POPULUI ALB (POPULUS ALBA) DIN BUTASIPIRIN REPICARE A PUIETILOR DIN SEMINTISURI IN PEPINIERA. [PROPAGATION OF P. ALBA BY CUTTINGS AND BY WILDLING SEEDLINGS TRANSPLANTED IN THE NURSERY.] *Rev. Padurilor* 74(1): 26-9. [Rum.russ.g.f.e.]

232.323.2

Partos, G. 1955. FEHER-ES SZURKENYAR-CSEMETEK MAGROLNEVELESE. [RAISING WHITE AND GREY POPLAR SEEDLINGS.] *Erdesz. Kutatas.*, Budapest 1955(2): 155-63. [Hu.russ.e.g.]
To allow for culling, 0.5-0.7 g. (1.0-1.5 c.c.) per sq.m. should be sown, to yield 30 seedlings with a collar diameter of 4 mm. Natural suppression of the rest occurs early. If density is $\geq 70/\text{sq.m.}$, artificial thinning (to 20-25 stems/sq.m.) appears necessary only if particularly strong plants are required; it should be done when dominants are 25-35 cm. high.

232.328

Delevoy, G. 1940(1945). MULTIPLICATION DU PEUPLIER BLANC. [PROPAGATION OF POPULUS ALBA.] *Bull. Soc. For. Belg.* 47(7/12): 302-S. [F.]

232.328.1

Bindiu, C. 1959. IN LEGATURA C' INMULTIREA PE CALEVEGETATIVA A POPULUI ALB (POPULUS ALBA). [THE VEGETATIVE PROPAGATION OF P. ALBA.] *Rev. Padurilor* 74(4): 206-9. [Rum.russ.g.f.e.]

Bokor, R. 1954. ADATOK A FEHER-ES SZURKENYARVEGETATIV SZAPORITASANAK KERDESEHEZ. [CONTRIBUTIONS TO THE PROBLEM OF THE VEGETATIVE PROPAGATION OF POPULUS ALBA AND P. CANESCENS.] *Erdesz. Kutatas.*, Budapest 1954(1): 18-25. [Hu.?] From abstr. in *Hung. Agric. Rev.* 3(3): 8. 1954. [E.]

Samsiev, K. 1959. VLIJANIJE TEMPERATURY VOZDUHA I VLAZHNOSTI POCHVY NA OKORENJAJEMOST I ROST CERENKOV TOPOLJA BOLLE. [THE INFLUENCE OF AIR TEMPERATURE AND SOIL MOISTURE ON THE ROOTING AND GROWTH OF POPULUS ALBA "AR. PYRAMIDALIS" CUTTINGS.] *Lesn. Hoz.* 12(9): 66-7. [Russ.]

Trials at Tashkent with cuttings 25 cm. long and 1 cm. in diameter, showed that rooting and growth were better at air temperatures of 11-23°C. (glasshouse) or 13-28°C. (outdoors) than at 10-18°C. (indoors), and were better in soil kept at 75% of maximum water-holding capacity than in soil kept at 60 or 45%. [Cf. Samsiev, 1959, Populus sp., 232.328.1.]

Sipos, S. 1957. TAPASZTALATOK A FEHERNYARDUGVANYOZASAVAL. [EXPERIENCE IN PROPAGATING POPULUS ALBA BY CUTTING.] *Erdo* 6(3): 111-4. [Hu.]
From abstr. in *Hung. Agric. Rev.* 6(4): 8-9. 1957. [E.] In April,

planted cuttings were exposed to half their length in the soil, which was then rammed and irrigated twice. A week later the cuttings were buried under 2 cm. of soil and after a month, when new shoots were 2-3 cm., uncovered to expose 2-3 buds. In summer, irrigation was done as required. The rooted cuttings were 73% against 50% by normal methods.

Takagi, T. 1951. [MORPHOLOGICAL POLARITY OF STEM CUTTINGS OF POPLAR.] *Sci. Bull.*, Faculty of Agric., Kyushu Univ. 13(1/4): 248-53. 11 refs. [Jap.jap.e.]

Cuttings of P. alba were treated with different concentrations of potassium alpha-naphthalene acetic acid in lanolin. When treated with 5 and 1 mg./g. concentrations, normal cuttings treated at the apex produced roots at the apex and buds at the base, and inverted cuttings treated at the base produced buds at the apex and roots at the base. This did not occur with concentrations of 0.9 mg. or 20 mg./g., and the latter proved toxic.

232.328.4

Partos, G. 1956. A FENER-ES A SZURKENYARVEGETATIVSZAPORITASA. [THE VEGETATIVE PROPAGATION OF WHITE AND GREY POPLARS.] *Erdesz. Kutatas.*, Budapest 1956(4): 167-73. 4 refs. [Hu.russ.e.g.]

232.328.5

Gambi, G. 1959. PROMETTENTE RISULTATO DELL'INNESTO DEL "POPULUS TREMULA" L. SU "POPULUS ALBA" L. [PROMISING RESULTS FROM THE GRAFTING OF P. TREMULA ON TO P. ALBA.] *Monte e Boschi* 10(12): 623-7. 3 refs. [It.f.e.]

On March 31, 1959, P. tremula scions were grafted on to 39 one-year rooted cuttings of P. alba. By July 3, 26 of the grafts had taken, with a mean scion shoot length of 1.2 m. Crown grafts were more successful than slit grafts.

Jakovlev, P. K. 1961. [PROPAGATING POPULUS ALBA "AR. PYRAMIDALIS" BY GRAFTING.] *Bjull. Glavn. Bot. Sada, Moskva* No. 43: 87. [Russ.]

232.41 1.5

Rubbo, R. 1962. [THE ADVANTAGES OF "SING "PIOPELLE" AND SEMI-"PIOPELLE" PLANTING STOCK FOR HYBRID ITALIAN POPLARS.] *Silvicultura*, Uruguay No. 17: 5-14. [Span.span.e.f.]
Presents the 1st-year's results of trials in establishing plantations of Populus x 'A.M.' using different kinds of planting stock.

232.43

Tuset, R. 1962. [GROWTH DATA FROM WIDELY SPACED POPLAR PLANTATIONS.] *Silvicultura*, Uruguay No. 17: 15-27. [Span.e.f.]

233 AFFORESTATION

Lucke, H. 1956. VERSUCH EINER HEIDEODLANDAUFFORSTUNG MIT PAPPELN. [HEATHLAND AFFORESTATION TRIALS WITH POPLARS.] *Holzzucht*, Reinbek 10(2): 9-10. [G.]

Radulovic, S. 1958. OBAHOFENOVJ TOPOLINA DELIBLASKOM PESKU I REZULTATIM DOSADAS NJIH PROUCAVANJA. [POPULUS BACHOFENI ON THE DELIBLATO SANDS: RESULTS OF RECENT STUDIES.] *Topola*, Beograd No. 8: 673-9. 6 refs. [Serb.f.]

234 FORMATION OF FOREST BY NATURAL SUCCESSION

Babos, I. 1955. A NYARFASOK HOMO KBUCKANELOFORDULO MEGJELENESIFORMAI. [FORMS OF JUNIPER/POPLAR STANDS GROWING ON SAND HILLS.] *Erdesz. Kutatas.*, Budapest 1955(4): 31-86. 22 refs. [Hu.russ.e.g.]

236.1

Freyenhagen, H. 1955. DEREINFLUSS "ON BODENBEARBEITUNG UND DUNGUNG AUF DIE ERTRAGNISSE BEIM FLURHOLZANBAU. [THE EFFECT OF SOIL CULTIVATION AND FERTILIZING ON WOOD YIELDS OUTSIDE THE FOREST.] *Holzzucht*, Reinbek 9(1): 4-5 [G.]

238 TIMBER PLANTATION CROPS REQUIRING SPECIAL TREATMENT

Marchesin, L. 1957. LA MADERA DEL ALAMO Y SAUCE EN LA INDUSTRIA DEL FOSFORO. [POPLAR AND WILLOW WOOD IN THE MATCH INDUSTRY.] *Forestal*, B. Aires No. 3: 9. [Span.]

4 FOREST INJURIES AND PROTECTION

416.17

[U.S.A.: Rocky Mt. For. Range Exp. Sta.] 1961. BROOMING OF NARROWLEAF COTTONWOOD [POPULUS ANGUSTIFOLIA] AND ASPEN [POPULUS TREMULOIDES] MAY RESULT FROM WINTER INJURY. Extr. from Rep. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. 1960: 18.

Superficially the *brooms resemble brooms of parasitic origin*, but it is suspected that they are *regrowths* following the killing of the *original branches by severe spring frost. Brooms on both species are* characterized by unusually large leaves, e.g. 7 in. long on *aspen vs. 2-3 in. for normal leaves.*

443 SALVAGE AND DISPOSAL OF FIRE-DAMAGED TIMBER

Dupias, G. 1943. CONTRIBUTION A L'ETUDE DES UREDINEES DE LA HAUTE-GARONNE. [CONTRIBUTION TO THE STUDY OF THE UREDINEAE OF THE HAUTE-GARONNE.] Bull. Soc. Hist. Nat. Toulouse 78: 32-52. [F.] Abstr. in Rev. Appl. Mycol. 27(6): 257-8. 1948.

List of rusts of the Haute-Garonne including *Melampsoramed-usae* on *Populus angulata* and *Gymnosporangium juniperi* on *Sorbus domestica*.

Servazzi, O. 1938. CONTRIBUTIONS TO THE PATHOLOGY OF POPLARS. V. RECORDS OF CANCERS ON THE WHITE POPLAR. Boll. Lab. Sper. R. Oss. Fitopat. Torino 15(1/2): 30-3. [It.e.] Plant Sci. Lit. 8(9): 7. 1938.

443.3

Dance, B. W. 1957. A FUNGUS ASSOCIATED WITH BLIGHT AND DIEBACK OF HYBRID ASPEN. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 13(6): 1-2.

Throughout Ontario the progeny of Populus alba × *P. grandidentata* are severely attacked *by a blight and dieback* (symptoms described), *consistently* associated with an unidentified *species of Gloeosporium*. The disease has not *been* observed on either parent.

Domanski, S. 1954. BADANIA NAD BIOLOGIA FOMES IGNARIUS (LINN.) FR. NA BIALODRZEWIE (POPULUS ALBA L.). [THE BIOLOGY OF F. IGNARIUS AT TACKING WHITE POPLAR.] Acta Soc. Bot. Polon. 23(3): 589-616. 28 refs. [Pol.e.]

5 MENSURATION

524.12

Armasescu, S., and Decei, I. 1954. CERCETARI ASUPRA COEFICIENTILOR DE FORMA AI ARBORILOR DE PLOP ALB SI PLOP NEGRU. [FORM FACTORS FOR TREES OF POPULUS ALBA AND P. NIGRA.] Bull. Sti. Acad. Repub. Rom. (Sect. Sti. Biol.) 6(2): 475-90. 6 refs. [Rum.russ.f.russ.f.]

The form factor (tree volume/cylindrical volume) *does not vary between the two species, it varies in* both with diameter as well as height, *and is* constant (0.427) for all *trees of* ≥ 50 cm. d.b.h. These conclusions are drawn from analysis of *404 black and 1,100 white poplars* from different parts of Rumania.

8 FOREST PRODUCTS AND THEIR UTILIZATION

811 STRUCTURE. I IDENTIFICATION

Walek-Czernecka, A. 1952. ANATOMIA POROWNAWCZA DREWNA POPULUS ALBA L., POPULUS TREMULA L., POPULUS CANESCENS S M. [COMPARATIVE WOOD ANATOMY OF P. ALBA, P. TREMULA, AND P. CANESCENS.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 8: 1-31. 21 refs. [Pol.russ.f.]

811.142/143

Kasarian, W. O. [Kazarjan, V. O.], and Abramian [Abramjan], B.M. 1956. [CHANCES IN THE WATER-CONDUCTING SYSTEMS OF

Pagony, H. 1961. [HEART ROT OF POPULUS ALBA, PHELLINUS (FOMES) IGNARIUS (L. EX FR.) QUELET.] Erdeszettud. Kozl., Sopron 1961(1): 79-90. 12 refs. [Hu.hu.russ.g.e.]

Extension of a former report (see Domanski, above) with colored illustrations, both macro- and microscopic, of the affected tissues. The material examined was 2 trees of P. alba and 2 of P. canescens.

Pereda, F. C. 1955. HADROMICOSIS DEL ALAMO PRODUCIDA POR VERTICILLIUM ALBO-ATRUM (R.Y B.). [VERTICILLIUM WILT OF POPLARS PRODUCED BY V. ALBO-ATRUM.] Idia No. 96: 22-4. 9 refs. [Span.]

Sarasola, A. A., and Magi, A. O. 1951. ALGUNOS FACTORES AMBIENTALES EN CORRELACION CON LA CANCROSIS DE LOS ALAMOS (MYCOSPACRELLA POPULORUM THOMP.). [SOME ENVIRONMENTAL FACTORS RELATED TO POPLAR CANCER.] Phytion, B. Aires 1(1): 42-5. 1 ref. [Span.e.]

Sinadskii, Ju. V., and Bondarceva, M. A. 1956. MALOIZVESTNYE TRUTOVIKI NA POPULUS I TAMARIX I IH ZNACENIE V KARA-KALPAK-SKOI ASSR. [LITTLE KNOWN SPECIES OF INONOTUS ON POPLARS AND TAMARISK, AND THEIR SIGNIFICANCE IN THE KARA-KALPAK ASSR.] Bot. Z. 41(8): 1177-83. 3 refs. [Russ.]

453 INSECTS

Patocka, J. 1953. HOUSENKY SKODICI TOPOLECH VEL'KEHO ZITNEHO OSTREVA V ROKU 1952. [CATERPILLAR PESTS ON POPLARS ON VEL'KY ZITNY ISLAND [SLOVAKIA] IN 1952.] Pol'ana 9(6): 131-3. [Cz.]

Santoro, F.H. 1957. CONTRIBUCION AL CONOCIMIENTO DE LA BIOLOGIA DE PLATYPUS SULCATUS. [THE BIOLOGY OF P. SULCATUS.] Rev. Invest. For., B. Aires 1(3): 7-20. 11 refs. [Span.]

Tomic, D. 1958. PRILOG POZNAVANJU CIKLUSA RAZVICA MALOG TOPOLINOG STAKLOKRILCA. [THE LIFE-HISTORY OF SCIAPTERON TABANIFORME.] Zast. Bilja No. 49/50: 87-94. 7 refs. [Serbe.]

Presents data on the life-history of S. tabaniforme damaging *white poplar*, particularly in the *region of Vojvodina. All ages are* attacked, but most frequently *2- to 5-year-old trees. Stems,* particularly *the lower* part, suffer *more* than branches, though heavy attack on branches *has* been observed in old *overdense* stands. [From author's summary.]

Csiszar, I. 1955. FATOMEGTABLAK SZERKESZTESE. [A STEP TOWARDS THE] CONSTRUCTION OF POPLAR VOLUME TABLES.] Erdesz. Kutatas., Budapest 1955(4): 15-29. 8 refs. [Hu.russ.e.g.]

568 OTHER MENSURATIONAL STUDIES OF STAND CONSTITUTION AND CHANGES THEREIN. DISTRIBUTION OF GROWTH BY TREE CLASSES, ETC.

McComb, A. L., and Hansen, N. J. 1954. A NATURALLY OCCURRING ASPEN-POPLAR HYBRID. J. For. 52(7): 528-9.

Cites map references in Iowa for two stands of Populus alba × *P. grandidentata* of *good form, rapid growth and apparent disease resistance, for one of which a stand and stock table is given (800 trees and 3,500 cu.ft./acre, 3-9 in. diam., 34-74 ft. with m.a.i. of 145 cu. ft. at 24 years, 3½ times that of oak of same age.*

WOODY PLANTS WITH HEIGHT IN THE STEM.] Dokl. Akad. Nauk Armjanskoi SSR 22: 129-34. [Russ?] From abstr. in Holzforschung, Berlin 10(6): 190. 1956. [G.]

Describes an anatomical study of the frequency, distribution, and diameter of vessels in shoots and stems of Salix alba var. pendula and Populus alba.

812 PHYSICAL AND MECHANICAL PROPERTIES

Horvat, I. 1960. PRILOG POZNAVANJU NEKIH FIZICKIH I MEHANIČKIH SVOJSTAVA BIJELE I CRNE TOPOLOVINE (POPULUS ALBA L.,

POPULUS NIGRAL.). [SOME PHYSICAL AND MECHANICAL PROPERTIES OF THE WOOD OF P. ALBA AND P. NIGRA.] Sum. List 84(3/4): 95-115. 12 refs. [Croat.croat.e.]

Lenz, O. 1956. LE BOIS DES PRINCIPAUX PEUPLIERS ET D'UN SAULE INDIGENES EN SUISSE. [THE WOOD OF THE CHIEF POPLARS *ND OF A WILLOW NATIVE TO SWITZERLAND.] Mitt. Schweiz. Anst. Forstl. Versuchsw. 32(5):203-27. 12 refs. [F.f.g.it.e.]

812.2/3

Benic, R. 1960. RASPORED NEKIH FIZICKIH SVOJSTAVA DRVETA U DEBLU BELE TOPOLE I BELE VRBE. [THE DISTRIBUTION OF SOME PHYSICAL PROPERTIES OF WOOD IN THE STEM OF POPULUS ALBA AND SALIX ALBA.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 2: 83-123. 12 refs. [Serb.serb.e.e.]

Presents results of studies on variations, *either transversely (from periphery to pith) or longitudinally, in ovendry and nominal sp. gr., radial, tangential and volume shrinkage, and fibre-saturation point.*

813 WOOD CHEMISTRY

[Spain: Inst. For. Invest. Exp.] 1956. LABORATORIO GENERAL DE QUIMICA FORESTAL. QUIMICA DE LA MADERA. [GENERAL LABORATORY OF FOREST CHEMISTRY. WOOD CHEMISTRY.] An. Inst. For. Invest. Exp., Madrid No. 1: 69-70. [Span.]

Presents results of chemical analyses of wood of *Eucalyptus obliqua*, *Pinus pinaster*, and *Populus bolleana*.

827.1

Lawniczak, M., and Radlinski, A. 1957. BADANIA NAD MOZLIWOSCIA GIECIA DREWNA TOPOLOWEGO. [INVESTIGATIONS ON THE POSSIBILITY OF BENDING POPLAR WOOD.] Przem. Drewny 8(5): 12-4. 3 refs. [Pol.]

832.2

[U.S.A.: For. Prod. Lab.] 1950. VENEER CUTTING *ND DRYING PROPERTIES. COTTONWOOL. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. D1766-3, 4 pp. 4 refs.

[U.S.A.: Veneers & Plyw.] 1936. THE MYSTERY OF THE ASPEN. Veneers & Plyw. 30(12): 10.

Deals with the origin and incidence of silver poplar, the veneer from which is known as aspen, on the eastern shores of the United States.

861.0

Prosinski, S. 1954. Z BADAN NAD WYODREBNIANIEM MASY CELULOZOWEJ Z DREWNA TOPOLI CZARNEJ I BIALEJ. [INVESTIGATIONS ON THE PULPING OF POPULUS NIGRA AND P. ALBA.] Sylwan 98(3): 229-38. 19 refs. [Pol.pol.]

9 FORESTS AND FORESTRY FROM THE NATIONAL AND INTERNATIONAL POINTS OF VIEW

907.1

Heineck. 1930. PYRAMIDAL P. ALBA AVENUE. Mitt. Dtsch. Dendrol. Ges. 42: 364.

P. BALSAMIFERA TO P. BEROLINENSIS

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

160.22

Ibrahim, R. K., and Towers, G. H. N. 1960. THE IDENTIFICATION, BY CHROMATOGRAPHY, OF PLANT PHENOLIC ACIDS. Arch. Biochem. 87(1): 125-8. 9 refs.

A *method is* described for the separation and identification of 21 phenolic acids. A *very brief survey of species* [including *Populus tacamahaca*, *Betula dahurica*, and *Tsuga canadensis*] indicates that the distribution of some of these compounds is *much more* extensive than *has been supposed*. [From authors' summary.]

161.4

Brown, A. B. 1937. ACTIVITY OF THE VASCULAR CAMBIUM IN RELATION TO WOUNDING IN THE BALSAM POPLAR, P. BALSAMIFERA L. Canad. J. Res. (Bot.Sci.) 15: 7-31. Plant Sci. Lit. 5(7): 4. 1937.

1937. ON HETEROAUXIN *ND CAMBIAL ACTIVITY IN POPULUS BALSAMIFERA. Nature 140(3551): 898-99.

165.41

Li, S. -W. 1960. PRIMENENIE MNOGOKRATNOGO OPLYENIJA V SELEKCIITOPOLEJ. [REPEATED POLLINATION IN POPLAR BREEDING.] Vestn. Sel'-Hoz. Nauki 5(2):140-3. 5 refs. [Russ.e.g.f.]

Manzos, A. M. 1960. BYSTRORASTUSCAJA FORMA POPULUS BALSAMIFERA L., POLUCENNAJA OT OPLYENIJA ZENSKIH CVETKOV POPULUS BALSAMIFERA L. FRAKCIIONIROVANNOJ PYL'COJ ETOGO "IDA. [PAST-GROWING FORM OF P. BALSAMIFERA OBTAINED BY POLLINATING FEMALE FLOWERS WITH FRACTIONATED POLLEN OF THE SAME SPECIES.] Dokl. Akad. Nauk SSSR 131(2): 433-5. 8 refs. [Russ.]

176.1

Joachim, H. F. 1956. UNTERSUCHUNGEN UBER POPULUS BEROLINENSIS DIPPEL. [INVESTIGATIONS OF P. BEROLINENSIS.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 16 (Beitr. Pappelforsch. No. 1): 71-101. 22 refs. [G.g.]

Redman, K. 1942. NOMENCLATURE CONFUSION IN THE CASE OF THE BALSAM POPLAR OR TACAMAHAC. J. Amer. Pharm. Ass. (Sci. ed.) 31(7): 220-3. Bblg.

Rouleau, E. 1946. POPULUS BALSAMIFERA OF LINNAEUS NOT A NOMEN AMBIGUUM. Rhodora 48(569): 103-10. Bblg.

1948. TWO NEW NAMES IN POPULUS [P. BALSAMIFERA L. VAR. FERNALDIANA NOM. NO*. (= P. BALSAMIFERA VAR. MICHAUXII HENRY) *ND X P. GILEADENSIS STAT. ET NOM. NO*. (BALSAMIFERA X DELTOIDES "AR. MISSOURIENSIS?; P. CANDICANS SENSU MICHX.). Rhodora 50(597): 233-6.

Suringar. 1929. SYSTEMATY OF P. BALSAMIFERA. Mitt. Dtsch. Dendrol. Ges. 41: 29.

Tucovic, A. 1955. PRILOG POZNAVANJU BERLINSKE TOPOLE (X POPULUS BEROLINENSIS DIPPEL). [CONTRIBUTION TO THE KNOWLEDGE OF P. BEROLINENSIS.] Sumarstvo 8(6): 338-44. 11 refs. [Croat.e.g.]

A *general* description, with some details relating to P. berolinensis in Serbia.

181 MODE OF LIFE, AUTECOLOGY

Roe, E. I. 1958. SILVICAL CHARACTERISTICS OF BALSAM POPLAR (POPULUS BALSAMIFERA). U. S. For. Serv. Lake St. For. Exp. Sta., Sta. Pap. No. 65, 17 pp. 42 refs.

181.31 1'

Krolkowski, L., and Baranski, R. 1961. [EFFECT OF DIFFERENT SOIL MOISTURE CONTENT ON POPLAR GROWTH.] Roczn. Gleboznawcze, Warsz. 10 (Suppl.): 719-21. [Pol.] *P. maximowiczii* × *P. berolinensis* cuttings grew best at soil m.c. 75%, then 100%, then 50%, and finally 25%.

18 1.342

Krolkowski, L., and Baranski, R. 1961. [EFFECT OF SOIL ACIDITY ON THE GROWTH OF THE HYBRID POPULUS 277.] Roczn. Gleboznawcze, Warsz. 10 (Suppl.): 714-6. [Pol.] Cuttings of *P. maximowiczii* × *P. berolinensis* grew best at pH 6-8, less well at pH 4.5 and not at all at pH 3.

181.41

Junas, G. G. 1952. PROJAVLENIE MEZVIDOVOI VZAIMOPOMOSCI V LESNYH POSADKAKH NA SUHIH DJUNNYH PESKAKH BUZULUKSKOGO BORA. [MUTUAL ASSISTANCE AMONG SPECIES USED FOR THE AFFORESTATION OF THE DUNE SANDS OF THE BUZULUK PINE FOREST.] Lesn. Hoz. 5(2): 56-61. [Russ.]

2 SILVICULTURE

Day, M. W., and Vogel, F. H. 1944. SILVICULTURE AND UTILIZATION OF BALSAM POPLAR. J. For. 42(7): 512-4.

228 CONSTITUTION AND COMPOSITION OF STANDS; FORMS OF STAND

Godnev, E. D. 1950. O VZAIMOOTNOSHENIYAKH TOPOLYA I BUZYNY V LESOPOSADKAKH. [ON THE MUTUAL RELATIONS OF POPLAR AND ELDER IN FOREST PLANTATION.] Agrobiologija 1950(2): 101-4. 2 refs. [Russ.]

232.1

Pourtet, J. 1950. LES PEUPLIERS BAUMIERS ET LEURS HYBRIDES. [THE BALSAM POPLARS AND THEIR HYBRIDS.] Rev. For. Franc. No.

4 FOREST INJURIES AND PROTECTION

443.3

Wallin, W. B. 1954. WETWOOD IN BALSAM POPLAR. Minn. For. Note No. 28, 2 pp.

453 INSECTS

Morris, R. F. 1956. NOTE ON PARANTHRENE TABANIFORMIS ROTT., A MOTH NEW TO NORTH AMERICA (LEPIDOPTERA: AGERIIDAE). Canad. Ent. 88(11): 652. 4 refs. (Contr. Div. Ent. Dep. Agric. Can. No. 3456.)

Larvae were found at Mount Pearl, Newfoundland, in 1952, boring into the stem of an injured *Populus balsamifera*—probably the first record of this European species in N. America.

524.3 15

Young, H. E. 1957. MERCHANTABLE HEIGHT VOLUME TABLES FOR RED AND SUGAR MAPLE, WHITE BIRCH, AND POPLAR. Tech. Note Univ. Mc. For. Dep. No. 45, 4 pp. Volumes to a 4-in. top diameter u.b.

525.1

Georgiev, Z. 1956. OPITNO-SORTIMENTNI TABLICI ZA KANADSKATA TOPOLA. [ASSORTMENT TABLES FOR POPULUS × 'CANADENSIS' [IN BULGARIA].] Gorsko Stopanstvo 12(5): 231-3. [Bulg.] For ages 5, 10, 15, 20, 25, and 30 years, and site classes 1 b, la, and I.

532 QUANTITY AND AREA OF FOLIAGE

Danilov, M. D., and Stepanov, V. S. 1960. LISTOVAJA MASSA I EFFEKTIVNOST' EE DEJATEL'NOSTI V PJATNADCATILETNEM NASAZDENII TOPOLJA BAL'ZAMICKESKOGO. [THE LEAF MASS AND ITS EFFICIENCY IN STANDS OF POPULUS BALSAMIFERA 15 YEARS OLD.] Lesn. Z., Arhangel'sk 3(2): 8.12. [Russ.] [Cf. Rodionov, 1959, below.]

181.525

Buc, T. G. 1961. [COMPARATIVE STUDY OF THE BIOLOGICAL FEATURES OF SEEDS OF TUSSILAGO FARFARA, POPULUS [BALSAMIFERA] AND SALIX [NIGRICANS].] Bjull. Glavn. Bot. Sada, Moskva No. 41: 66-73. 9 refs. [Russ.]

Compares the dependence of germination on temperature; the change in the content of SH-groups during germination; and the distribution of physiologically active substances and of the activity of respiratory enzymes during germination.

181.63

Korovin, V. A. 1960. "VETKOPAD" U TOPOLJA. ["TWIG SHEDDING" IN POPLARS.] Priroda, Moskva 49(6): 68. [Russ.]

181.8

Marcet, E. 1956. DIE PHANOLOGIE ALS BESTIMMUNGSMERKMAL BEI PAPPELSORTEN. [PHENOLOGY AS A DISTINGUISHING CHARACTER OF POPLAR VARIETIES.] Ber. Schweiz. Bot. Ges., Zurich 66: 5-18. 8 refs. [G.g.]

6: 317-22. [F.]

A short account of this section of *Populus*, and an estimate of their suitability for planting in France.

234 FORMATION OF FOREST BY NATURAL SUCCESSION

Leisman, G. A. 1955. A VEGETATION AND SOIL CHRONOSEQUENCE ON THE MESABI IRON RANGE SPOIL BANKS, MINNESOTA. Abstr. Of thesis, in Dissert. Abstr. 15(11): 1987-8. [Univ. Minn.]

1957. A VEGETATION AND SOIL CHRONOSEQUENCE ON THE MESABI IRON RANGE SPOIL BANKS, MINNESOTA. Ecol. Monogr. 27(3): 221-45. 34 refs.

Rodionov, M. S. 1956. K METODIKE OPREDELENIJA KOLICESTVA LISTVY V MOLODYH POLEZASCITNYH LESNYH NASAZDENIJAH. [METHODS OF DETERMINING THE AMOUNT OF FOLIAGE IN YOUNG SHELTER-BELT STANDS.] Bot. Z. 41(4): 532-4. 8 refs. [Russ.]

1959. OB OPREDELENIJI MASSY LISTVY ZASCITNYH LES-OPOLOV. [DETERMINING FOLIAGE WEIGHT IN SHELTERBELTS.] Bot. Z. 44(3): 333-7. 9 refs. [Russ.]

551 IN SINGLE TREES WITH ANNUAL RINGS

Kirby, C. L. 1953. ACCURACY OF RING COUNTS ON POPLAR. Silv. Leaf. For. Br. Can. No. 85, 2 pp. Eighty-seven percent of ring counts in the field on 23 representative sample discs of *P. tremuloides* and *P. balsamifera* were below those made in the laboratory. This may be attributed to indistinct demarcation between early and late wood and to the presence of decay.

566 YIELD TABLES AND THEIR CONSTRUCTION

Armasescu, S. 1959. TABELE GENERALE DE PRODUCTIE PENTRU PLOPII NEGRI HIBRIZI DIN R.P.R. [GENERAL YIELD TABLES FOR HYBRID BLACK POPLARS IN RUMANIA.] Rev. Padurilor 74(10): 589-92. 11 refs. [Rum.]

Describes the data and construction of the tables, extracts from which are given for 3 out of the 5 yield classes. Some comparative data from Germany, Czechoslovakia, Bulgaria, and Hungary are also given. Tables cover ages 4-26. The poplars most frequently planted in Rumania are *Populus × marilandica* and *P. × regenerata*.

Avram, C. 1959. TABELE DE PRODUCTIE PROVIZORII PENTRU PRINCIPALELE SPECII FORESTIERE DIN LUNCA DUNARII. [PROVISIONAL YIELD TABLES FOR THE PRINCIPAL FOREST TREE SPECIES GROWING ON THE BANKS OF THE DANUBE.] Rev. Padurilor 74(3): 156.9. [Rum. russ.g.f.c.]

Gives tables of pollarded willows, osiers, hybrid black poplars, and *Fraxinus pennsylvanica*.

6 FOREST MANAGEMENT

613 EXPLOITABILITY AND ROTATION

Kallay, J. 1962. [ECONOMICS OF POPLAR GROWING, PARTICULARLY ON SHORT ROTATIONS.] *Erdo* 11(9): 394-402. [Hu.g.russ.]

Compares *data on volume, quality, and financial* yields of final *fellings* in robinia, *oak, and poplar*. Poplar rotations of 20 years, or possibly *even less, are* considered economic and it is recommended *to plant one or two short* generations of poplars after robinia *or oak on* suitable sites. [From author's summary.]

Toth, B. 1962. [POPLAR STANDS WITH SHORT ROTATIONS.] *Erdo* 11(9): 385-93. 3 refs. [Hu.g.russ.]

Argues, with some growth *and soil data for* illustration, that on a *number* of sites, frequently oak *sites, unsuitable for long* poplar rotations but whose *top* 50 cm. of soil can support poplars, *pulp-*

wood rotations of 12-15 years would be economic. *Populus* × 'Robusta' and, for wet *sites, P.* × 'marilandica' al-e suggested.

651.5

Schmitz-Lenders, B. 1958. HOHE ODER NIEDRIGE UMTRIEBE BEIM PAPPELANBAU. [LONG OR SHORT ROTATIONS FOR POPLAR PLANTATIONS?] *Allg. Forst- u. Jagdztg.* 129(7): 163-7. 1 ref. [G.e.]

653 VALUE INCREMENT OF THE STEM; DEVELOPMENT AND STRUCTURE OF THE STAND AS REGARDS VALUE

Gravenstedt. 1960. ERTRAGE AUS ALTEREN PAPPELANPFLANZUNGEN ALS HINWEIS FÜR ZUKUNFTIGEN ANBAU. [YIELDS FROM OLD POPLAR PLANTATIONS AS A POINTER FOR FUTURE PLANTING.] *Forst- u. Holzw.* 15(11): 213-4. [G.]

8 FOREST PRODUCTS AND THEIR UTILIZATION

810 GENERAL INFORMATION ON WOOD

Betts, H. S. 1942. AMERICAN WOODS: BALSAM POPLAR. U. S. For. Serv., 4 pp. Bblg.

81 1.156

Scaramuzzi, G. 1958(1959). VARIAZIONI DIMENSIONALI DELLE FIBRE NEL FUSTO IN POPULUS × EURAMERICANA CV. '214'. [VARIATION IN THE DIMENSIONS OF FIBRES IN A STEM OF P. × CANADENSIS CV. '214'.] *Pubbl. Cent. Sper. Agric. For., Roma* 2: 87-118. 34 refs. [It.it.e.e.]

1959(1960). INDAGINI TECNOLOGICHE SUL LEGNO DI ALCUNI IBRIDIEURAMERICANI DI PIOPPO. II. DATI ANATOMIC [TECHNOLOGICAL INVESTIGATIONS ON THE WOOD OF SOME HYBRID POPLARS [POPULUS × CANADENSIS]. II. Anatomical data.] *Pubbl. Cent. Sper. Agric. For., Roma* No. 3: 193-216. 38 refs. [It.it.e.e.]

The investigations already made on *clone 'I 214' have been extended to three other clones ('I 154', 'I 455', and 'I 488 b')*.

811.22

Messeri, A. 1953. ALCUNI DATI SULLA STRUTTURA SUBMICROSCOPICA DELLE FIBRE DI TENSIONE DI UN CAMPIONE DI LEGNO DI PIOPPO. [SOME DATA ON THE SUBMICROSCOPIC STRUCTURE OF TENSION-WOOD FIBRES FROM A SAMPLE OF POPLAR WOOD.] *Atti dell'Accademia Nazionale dei Lincei (Ser. 8), Roma* 14(2): 315-22. 6 refs. [It.]

81 1.59

Wallin, W. B. 1954. WETWOOD IN BALSAM POPLAR. *Minn. For. Note* No. 28, 2 pp.

812.7

Giordano, G., and Curro, P. 1962. EFFECT OF TEMPERATURE ON THE STRENGTH PROPERTIES OF WOOD IN STATE OF TOTAL SATURATION. *Proc., 13th Congr. Int. Union For. Res. Organ., Vienna* 1961, Pt. 2(2), Sect. 41112, 12 pp. 8 refs. [E.e.]

813 WOOD CHEMISTRY

Bagrova, R. H., Balakina, G. P., and Kozlov, V. N. 1962. [CHEMICAL COMPOSITION OF THE WOOD OF POPULUS BALSAMIFERA IN THE URALS.] *Lesn. Z., Arhangel'sk* 5(3): 155-9. 14 refs. [Russ.]

Jayme, G., and Harders-Steinhauser, M. 1950. UBER DIE CHEMISCHE ZUSAMMENSETZUNG DES ZUGHOLZES IN EINEM PAPPELHOLZ [CHEMICAL COMPOSITION OF TENSION WOOD IN A POPLAR.] *Papier, Darmstadt* 4(7/8): 104-13. 23 refs. [G.g.]

813.1

Runger, H. G., and Klauditz, W. 1953. UBER BEZIEHUNGEN ZWISCHEN DER CHEMISCHEN ZUSAMMENSETZUNG UND DEN FESTIGKEITSEIGENSCHAFTEN DES STAMMHOLZES VON PAPPELN. [RELATIONSHIPS BETWEEN THE CHEMICAL COMPOSITION OF POPLAR STEMWOOD

AND ITS STRENGTH PROPERTIES.] *Holzforschung, Berlin* 7(2/3): 43-58. 40 refs. [G.g.e.]

813.1.1

Brown, S. A. 1961. STUDIES OF LIGNIN BIOSYNTHESIS "SING ISOTOPIC CARBON. IX. TAXONOMIC DISTRIBUTION OF THE ABILITY TO UTILIZE TYROSINE IN LIGNIFICATION. *Canad. J. Bot.* 39(2): 253-8. 12 refs.

Presents and discusses results of tests of the ability to utilize L-tyrosine as a lignin precursor in 21 *species* (including *Populus balsamifera* and *Caragana arborescens*) representing 7 families of monocotyledons and 5 of dicotyledons. *Only grasses were able to convert* L-tyrosine and L-phenylalanine to *lignin with equal efficiency*.

and Neish, A. C. 1955. STUDIES OF LIGNIN BIOSYNTHESIS "SING ISOTOPIC CARBON. I". FORMATION FROM SOME AROMATIC MONOMERS. *Canad. J. Biochem. Physiol.* 33(6): 948-62. 37 refs.

Deals mainly with lignin biosynthesis in wheat, but also contains tabulated data on conversion of labelled compounds to lignin in Acer negundo, Populus balsamifera, and Caragana arborescens.

841.21

Chiani, R. G. 1961. [PRESERVATION OF POPLAR AND WILLOW BOARDS.] *Foll. Tec. For. Adm. Nac. Bosques, B. Aires* No. 14, 18 pp. [Span.]

841.3

Tinto, J. C. 1960. IMPREGNACION DE POSTES PARA "SO RURAL. EXPERIENCIAS REALIZADAS EN LA ARGENTINA CON MADERAS DE ESPECIES FORESTALES CULTIVADAS. [PRESERVATION OF POSTS FOR RURAL PURPOSES. TESTS CARRIED OUT IN ARGENTINA WITH WOODS OF INTRODUCED FOREST SPECIES.] *Foll. Tec. For. Adm. Nac. Bosques, B. Aires* No. 5, 13 pp. [Span.]

1961. [PRELIMINARY RESULTS OF DURABILITY TESTS WITH IMPREGNATED POSTS AND VINE PROPS.] *Foll. Tec. For. Adm. Nac. Bosques, B. Aires* No. 15, 12 pp. [Span.]

Presents an interim report on graveyard tests established in 1954.

852.1

Harzmann, L. J. 1957. DAS HOLZ ANBAUWÜRDIGER SCHWARZPAPPELHYBRIDEN. [THE WOOD OF WORTHWHILE BLACK POPLAR HYBRIDS.] *Holz-Zbl.* 83(123): 1503-6. 17 refs. [G.g.]

852.16

Larsen, C. M. 1955. COMPTE RENDU D'UNE ETUDE SUR LE BOIS PELUCHEUX D'UN PEUPLIER BELGE EN CONSIDERATION DE SON RÔLE DANS L'INDUSTRIE ALLUMETTIÈRE. [A STUDY OF "WOOLINESS" OF BELGIAN POPLAR IN RELATION TO ITS USE AS MATCH STOCK.] *Spec. Pap. 8th Sess. Int. Poplar Comm., Madrid* 1954 No. FAO/CIP/75-D Add. 1: 101-14. [F.]

P. CANADENSIS TO P. DAVIDIANA

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

160.29

Klopping, H. L., and Kerk, G. J. M. van der 1951. ANTIFUNGAL AGENTS FROM THE BARK OF *POPULUS CANDICANS*. *Nature*, Lond. 167(4259) : 996-7. 6 refs.

More detailed study of the bark of *P. candicans* resulted in the isolation of two actively fungistatic substances, *benzyl gentisate* and *another* not identified but *very* similar to *pentatriacontene-17*.

161.7

Eisbacher, H. 1962. ANWENDUNG DER KRYOSKOPIE IN DER FORSTLICHEN FORSCHUNG. [THE USE OF CRYOSCOPY IN FOREST RESEARCH.] *Proc. 13th Congr. Int. Union For. Res. Organ.*, Vienna 1961, Pt. 2(1), Sect. 23127, 3 pp. [G.g.e.f.]

164.3

Ruggeri, C. 1963. [ANATOMICAL DIFFERENCES IN THE ROOTS OF SOME EURAMERICAN POPLAR HYBRIDS.] *Pubbl. Cent. Sper. Agric. For.*, Roma 6: 131-40. 6 refs. [It.it.e.e.]

Of seven clones investigated, only "I 214" showed any striking difference, being distinguished by the constant presence of pith and the highest percent of bark.

164.5

Broekhuizen, J. T. M. 1961. VERANDERINGEN IN DE BLADVORM VAN ENIGE POPULIERKLONEN GEDURENDE DE VEGETATIEPERIODE. [VARIATIONS IN THE LEAF SHAPE OF SOME POPLAR CLONES DURING THE GROWTH SEASON.] *Commun. Inst. For. Res. Agric. Univ. Wageningen* No. 3, 35 pp. 4 refs. [Du.e.]

Fortunatov, I. K. 1949. MORFOLOGICKOE VYRAZENIE VOZRASTE POBEGOVU TOPOLJARAZNOLISTNOGO. [MORPHOLOGICAL EXPRESSION OF SHOOT AGE IN *POPULUS DIVERSIFOLIA*.] *Dokl. Akad. Nauk SSSR* 64(3) : 393-6. [Russ.]

A study of leaf-shape variation on various types of shoot.

164.9

Sauer, E. 1956. STACHELAHNLICHBILDUNGEN BEI EINEM BASTARD ZWISCHEN ZWEI BALSAMPAPPELN. [THORN-LIKE FORMATIONS ON A HYBRID BALSAM POPLAR.] *Z. Forstgenet.* 5(4):103-4. [G.e.f.] Describes thorn-like outgrowths on the corky ridges of the internodes on one seedling derived from the artificial cross *Populus candicans* × *P. trichocarpa*. [See also translation Oxford No. 237S.]

1956. THE THORN-LIKE FORMATION ON A HYBRID OF TWO BALSAM POPLARS. *Transl. U.S. For. Serv. For. Prod. Lab.*, Madison No. 402, 3 pp. 1960.

Transl. by D. Pronin from *Z. Forstgenet.* 5(4):103-4. [G.]

165.3

Koltay, G., and Kopecky, F. 1954. OSHONOS NYARAINK LEROMLOTT OROKLOTTSEGENEK MEGJAVITASA. [IMPROVEMENT OF THE DETERIORATED INDIGENOUS STOCK OF POPLAR IN HUNGARY.] *Erdesz. Kutatas.*, Budapest No. 2: 65-86. 15 refs. [Hu.]

Muller, R. 1957. ALTSTAMMSORTENDERSCHWARZPAPPELBASTARDE FÜR DEN ANBAU IN DEUTSCHLAND. I. A. GRUNDLAGEN DES SORTENBEGRIFFS. I. B. EIGENSCHAFTEN DER ALTSTAMMSORTEN. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS FOR CULTIVATION IN GERMANY. I. A. THE BASES OF THE CONCEPT OF 'VARIETY' I. B. THE CHARACTERISTICS OF THE 'OLD STOCK VARIETIES'.] *Holz-Zbl.* 83 (45; 73/74):611-3; 939-43. 67 refs. [G.g.]

165.41

Bugala, W. 1951. EURO-AMERYKANSKIE MICSZANCE TOPOLICZARNYCH, I C H ZNACZENIE ORAZ KROTKI PRZEGLAD DOTYCHCZASOWYCH OSIAGNIEC HODOWLI TOPOLI W ZSRR. [EURO-AMERICAN HYBRIDS OF BLACK POPLARS, THEIR PRACTICAL VALUE, AND A SHORT REVIEW OF ACHIEVEMENTS TO DATE IN POPLAR BREEDING IN THE USSR.] *Sylvan* 95(3/4) : 324-38. 24 refs. [Pole.]

Kopeczky, F. 1956. A SZURKENYARTELEPITESENEK GENETIKAI KERDESEI. [THE GENETIC PROBLEMS OF GREY POPLAR PLANTINGS.] *Erdo* 5(1) : 23-9. [Hu.]

From *abstr.* in *Hung. Agric. Rev.* 5(2):9. 1956. [E.]

Seitz, F. W. 1954. UBER DEN SELBSTUNGS-UND KREUZUNGSERFOLG BEI VERWENDUNG DES POLLENS DER ZWITTRIGEN GRAUPAPPEL "ON DILLINGEN. [RESULTS OF SELFING AND CROSSING "SING POLLEN OF THE DILLINGEN ANDROGYNOUS GREY POPLAR.] *Abstr. in Z. Forstgenet.* 3(6) : 141. [G.]

165.42

Seitz, F. W. 1954. UBER DAS AUFTRETEN "ON TRIPLOIDEN NACH DER SELBSTUNG ANOMALER ZWITTERBLUTEN EINER GRAUPAPPELFORM. [THE OCCURRENCE OF TRIPLOIDS AFTER SELF-POLLINATION OF ANOMALOUS ANDROGYNOUS FLOWERS OF A GREY POPLAR.] *Z. Forstgenet.* 3(1) : 1-6. 13 refs. [G.g.e.]

J65.43

Sekawin, M. 1963. [STUDY OF AN ARTIFICIALLY OBTAINED POPLAR TETRAPLOID AND ITS PROGENY.] [Pap.] *FAO World Consult. For. Genet.*, Stockh. 1963 No. FAO/FORGEN 63/-1/4, 11 pp. 7 refs. [F.f.]

The poplar, I 438 p, obtained by colchicine treatment from I 154, was of poor form and vigor, but much more fertile than I 154, and its fibre dimensions were superior. Its progeny, all triploid, were intermediate between their male tetraploid and female diploid parent.

165.5

Vojtus, M. 1961. ONIEKTORYCH TYPOCH BIELYCH TOPOL'OV (POPULUS ALBA L. A POPULUS CANESCENS SM.) V PODUNAJSKYCH LUZNYCH LESOCH CSSR. [SOME TYPES OF WHITE POPLARS (P. ALBA AND P. CANESCENS) IN THE DANUBE FLOOD-PLAIN FORESTS OF CZECHOSLOVAKIA.] *Lesn. Cas.* 7(3) : 161-74. 8 refs. [Slovak.russ.g.]

165.53

Wettstein, W., and Vieghofer, L. 1958. PHYSIOLOGISCHE UNTERSCHIEDE MORPHOLOGISCH NICHT UNTERSCHIEDBARER PAPPELKLONE. PRÜFUNGSERGEBNISSE DER SOG. DRAPAL-PAPPEL. [PHYSIOLOGICAL DIFFERENCES BETWEEN MORPHOLOGICALLY INDISTINGUISHABLE POPLAR CLONES. RESULTS OF EXPERIMENTS WITH THE SO-CALLED DRAPAL POPLAR.] *Holzforchung*, Berlin 11(5/6) : 139-42. 2 refs. [G.g.e.]

165.62

Marcet, E. 1960. BEITRAG ZUR FRÜHDIAGNOSE "ON TIEF-UND HOCHLAGENSORTEN BEI SCHWARZPAPPELHYBRIDEN. [TESTS FOR EARLY SELECTION OF BLACK POPLAR HYBRIDS SUITABLE FOR LOW OR HIGH ALTITUDES.] *Schweiz. Z. Forstw.* 111(8) : 428-40. 2 refs. [G.f.]

165.72

Kobendza, R. 1953. CZYM JEST TOPOLAROGALINSKA? [WHAT IS *POPULUS ROGALINENSIS*?] *Roczn. Dendrol. Polsk. Tow. Bot.*, Warsz. 9 : 153-66. 3 refs. [Pol.russ.e.]

Morelli, A. 1960. [THE CULTIVAR BLM SELECTED AT THE POPLAR BREEDING CENTRE OF VILLANUOVA SOLARO (CUNEO).] *Agricoltura Delle Venezie, Venezia* 14(12) : 490-508. [It.]

Describes its sex (male), habit, nursery cultivation, wood properties, health, increment, etc. Data from ordinary and "linear" plantations aged 2 to 14 years from planting indicate that weights of green stemwood of ca. 15 quintals/tree or 4200/ha, at 6 × 6 m spacing are obtained. Though occasionally doing well on poorer sites, it is best for good ones.

Saatcioglu, F. 1956. BOZKAVAK (POPULUS CANESCENS SMITH) MELEZINIM SUN'I CAPRAZLAMA METODIYLE ELDE EDILMESI. [ARTIFICIAL PRODUCTION OF *POPULUS CANESCENS* BY CROSSING.] *Istanbul Univ. Orm. Fak. Derg.* 6(2) : 70-91. 13 refs. [Turk.g.g.]

Gives details of the laboratory hybridization and culture of *P. alba* × *P. tremula* and *P. tremula* × *P. alba*, the early nursery

growth of which was 20% greater than selfed *P. alba*. Leaves of the two crosses and of pure *P. alba* are illustrated.

165.72/73

Bogdanov, P. L. 1958. NOVYE GIBRIDY TOPOLEJ. [NEW POPLAR HYBRIDS.] Lesn. Hoz. 11(3): 85-6. [Russ.]

Brief notes on *Populus suaveolens* × *P. canadensis*—the "Leninograd poplar," and a "vegetative hybrid" taken from buds at the graft union of *P. suaveolens* and *P. canadensis*. Both are said to be fast-growing, and resistant to cold, and the "vegetative hybrid" is not susceptible to leaf rust.

176.1

Boom, B. K. 1957. POPULUS CANADENSIS MOENCH VERSUS P. EURAMERICANA GUINIER. Acta Bot. Neerland. 6(1): 54-9. 16 refs. [E.e.]

Upholds the validity of the name *P. × canadensis* Moench, rejecting *P. × euramericana* Guinier, for the hybrids of *P. deltoides* × *P. nigra*.

Broekhuizen, J. T. M. 1960. SOME NOTES ON THE IDENTIFICATION AND NOMENCLATURE OF POPLARS. Commun. Inst. For. Res. Agric. Univ. Wageningen No. 1, 9 pp. 8 refs. [E.]

Dzekov, S. 1960. SISTEMATSKI POLOZAJ, GEOGRAFSKE I EKOLOSKE OSOBINE, KAO I SUMSKO-UZGOJNA SVOJSTVA DOMACE SIVE TOPOLE (POPULUS) CANESCENS SM.) UNRMKEDONIJI. [SYSTEMATIC POSITION, GEOGRAPHICAL AND ECOLOGICAL CHARACTERISTICS, AND PROPERTIES AS A FOREST TREE AND IN PROPAGATION, OF P. CANESCENS IN MACEDONIA.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 2: 3-38. 20 refs. [Serb.f.]

Frontera Marques, B. 1955. LEPEUPLIER BLANC D'ALFAMBRA. [THE WHITE POPLAR OF ALFAMBRA.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-V Add. 7, 5 pp. [F.] Describes a poplar (probably *P. canescens*) that occurs in some abundance in this region of aragon. It is recommended that it should be tried for planting on cold sites and alkaline soils in other parts of Spain. It suckers freely.

Gerhard, H. 1957. DIE GRAUPAPPEL IN SCHLESWIG. [POPULUS CANESCENS IN SCHLESWIG.] Allg. Forstzeitschr. 12 (27/28): 333-6. 5 refs. [C.]

Discusses the history of the species and concludes that the specimens found in Schleswig are, with but few exceptions, from a single clone; also mentions propagation by root and shoot cuttings, grafting, layering, and suckers.

[International: FAO/Int. Poplar Comm.] 1959. NOMENCLATURE AND REGISTRATION [OF POPLAR HYBRIDS OF THE SECTION AIGEROS.] [Docum.] 10th Sess. Int. Poplar Comm. 1959 No. FAO/CIP/97, 5 pp. [E.]

Includes an annex by J. Pourtet, tracing the history of nomenclature refuting recently advanced arguments in favor of *Populus canadensis*, and concluding that the correct name for the group should be *Populus × euramericana* Guinier [cf. Boom, 1957, this subject classification].

Issler, 1929. NOTE ON IDENTIFICATION OF P. CANESCENS. Biol. Abstr. 32: 510.

Jovanovic, B., and Tucovic, A. 1960. TAKSONOMSKA PROUCAVANJA JASIKE (POPULUS TREMULA L.) ODNOSNO T.ZV. BAHOFENOVE TOPOLENA DELIBLATSKEJ PESCARI. [TAXONOMIC STUDIES ON ASPEN (P. TREMULA) WITH REFERENCE TO THE SO-CALLED BACHOFEN POPLAR ON THE DELIBLATO SANDS.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 1: 5-41. 24 refs. [Serb.serb.g.]

Mirbach-Harff. 1933. P. CANADENSIS IN GERMANY. Mitt. Dtsch. Dendrol. Ges. 45: 308-10.

Muller, R. 1958. DER WERT DER WIRTSCHAFTSPAPPELSORTEN (SCHWARZPAPPELBASTARDE). [THE VALUE OF POPULUS NIGRA HYBRIDS.] Forst- u. Holz. 13(6): 109-11. [G.]

A general discussion of the nature of 'old stock varieties', particularly the significance of the climatic range of the parents on disease resistance, growth, etc., advocating more widespread use of some, and stressing the need for systematic selective breeding of new varieties. [Cf. Muller, 1957, *P. canadensis* to *P. davidiana*, 165.3.]

1958. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIE. DIE 'ECKHOF'-PAPPEL. IIF. DIE 'EUKALYPTUS'-PAPPEL.

[OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIE. THE 'ECKHOF' POPLAR. IIF. THE 'EUCALYPTUS' POPLAR.] Holz-Zbl. 84(76; 77): 993; 1009-10. 11 refs. [G.]

The 'Eckhof' poplar includes some clones distributed as *P. 'regenerata'* Huttenfeld. Varieties going under the names 'regenerata erecta' and 'virginiana' are identified with the 'Eucalyptus' poplar.

1958; 1959. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIH, I, K-M. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIH, I, K-M.] Holz-Zbl. 84(105; 124; 128): 1333-4; 1577-8; 1635-6; 85(50; 62): 663-4; 822-3. Many refs. [G.]

Further installments, as follow. (h) The 'grandis' poplar (includes clones distributed as 'carrieriana', 'carrieri' (from England), 'wislizenii' and 'regenerata'). (i) The 'gelrica' poplar. (k) The 'Leipzig' poplar. (l) The Bavarian 'Flachslanden' poplar, considered highly resistant to rust, canker, and extremes of temperature, and recommended for cultivation outside Bavaria. (m) The 'missouriensis Holland' poplar, which resembles *P. × robusta*; listed by the International Poplar Commission as *P. deltoides* cv. 'missouriensis imp. hollandaise', but considered to be a hybrid, not identical with *P. deltoides* subsp. *missouriensis*.

1959. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIN, O. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIN, O.] Holz-Zbl. 85(114; 138): 1521-3; 1858-60. 22 refs. [G.]

(n) The 'Neupotz' poplar of Baden and the Palatinate, considered the most valuable variety on the flood-plains in the region, is distinguished from *P. × regenerata*, and the cultivar going under the name of *P. "regenerata"* in Western Europe, has been named poplar, which is considered identical with clones going under the name of *P. "regenerata"* in Western Europe, has been named 'Forndorf' by the German Pappelmarkenetikett authority to distinguish it clearly from 'Regenerata Deutschland'. Synonyms, trade names, and identification in the wider 'Regenerata' group, comprising "Forndorf," "Regenerata Deutschland," "Grandis" and "Leipzig," are tabulated. The cultivar is considered hardy, and resistant to canker but not to rust, and is recommended for sites that are climatically somewhat adverse (e.g. in Schleswig Holstein).

1960. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIP. DIE 'MARILANDICA'-PAPPEL. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIP. THE 'MARILANDICA' POPLAR.] Holz-Zbl. 86(31): 477-9. 23 refs. [G.]

1960. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIQ. DER SORTENFortschritt in der Pappelwirtschaft. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIQ. BETTER VARIETIES FOR POPLAR GROWERS.] Holz-Zbl. 86(56): 791-2. [G.]

1960. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIR. DIE 'SEROTINA'-PAPPEL. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIR. THE 'SEROTINA' POPLAR.] Holz-Zbl. 86(91): 1283-4, 1286. 15 refs. [G.]

1960. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIS. DIE 'PAPPEL' 'REGENERATA DEUTSCHLAND' = 'HARFFER PAPPEL'. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIS. THE 'REGENERATA DEUTSCHLAND' OR 'HARFF POPLAR'.] Holz-Zbl. 86(98): 1369-70. 23 refs. [G.]

1960. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIT. DIE 'ROBUSTA'-PAPPEL. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. IIT. THE 'ROBUSTA' POPLAR.] Holz-Zbl. 81(118): 1658-1663. 51 refs. [G.g.]

1961. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. II*. NEUSORTEN AUS ALTSTAMMEN UND FREMDE ALTSORTEN. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS. II*. NEW VARIETIES FROM 'OLD STOCKS', AND FOREIGN 'OLD STOCK' VARIETIES.] Holz-Zbl. 87(21): 319-24. 21 refs. [G.]

and Sauer, E. 1958. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE FÜR DEN ANBAU IN DEUTSCHLAND. II. DIE EINZELNEN PAPPELSORTEN. (A) EINLEITUNG: ÜBERSICHT DER MERKMALE DER SCHWARZPAPPELBASTARDE. (B) DIE 'DROMLING'-PAPPEL. (C) DIE 'LONS'-PAPPEL. (D) DIE 'BRABANTICA'-PAPPEL. [OLD STOCK VARIETIES OF BLACK POPLAR HYBRIDS FOR CULTIVATION IN GERMANY. II. THE INDIVIDUAL VARIETIES. (A) INTRODUCTION. (B) THE 'DROMLING' POPLAR. (C) THE 'LONS' POPLAR. (D) THE 'BRABANTICA' POP-

LAR] Holz-Zbl. 84(19; 31; 55; 58 59): 283-5; 437-9; 721; 775-8. 18 refs. [G.]

Pavari, A. 1937. ALCUNE OSSERVAZIONI SUL PIOPPO DEL CANADA. [SOME NOTES ON THE CANADIAN POPLAR.] In Atti del Convegno di Pioppicoltura 1937 :55-60. [It.]

Pohl, Z., and Stecki, Z. 1959. TOPOLA SZARA W WIELKOPOLSCE. [THE GREY POPLAR IN WIELKOPOLSCE NATIONAL PARK?]. Arbor. Kornickic, Poznan No. 4: 109-22 18 refs. [Pol.russ.e.e.]

Poskin, A. 1947. LES VARIETES ET LES TYPES DE PEUPLIER DU CANADA. [THE VARIETIES AND TYPES OF "CANADIAN" POPLAR.] Bull. Soc. For. Belg. 54(11):377-91. [F.]

Redman, K. 1942. NOMENCLATURE CONFUSION OF POPULUS CANADICANS AITON. J. Amer. Pharm. Ass. (Sci. Ed.) 31(5): 140-1. Bblg.

Rehder. 1931. NOTE ON PCATHAYANA. J. Arnold Arbor. 12: 59.

[Rumania : Rev. Padurilor] 1957. [BREEDING AND GROWING HYBRID BLACK POPLARS IN RUMANIA.] Rev. Padurilor 1957(5):291-314. [Rum.russ.g.f.e.]

Rusch, J. 1959. DAS VERHALTNIS "ON TRANSPIRATION UND ASSIMILATION ALS PHYSIOLOGISCHE KENNGROSSE, UNTERSUCHT AN PAPPELKLONEN. [AN INVESTIGATION WITH POPLAR CLONES ON THE "SE OF THE RELATIONSHIP OF TRANSPIRATION AND ASSIMILATION AS A PHYSIOLOGICAL INDEX.] Zuchter 29(8):348-54. 41 refs. [G.g.]

Sauer, E. 1958. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIG. BESTIMMUNGSTABELLE FÜR DIE BAUMSCHULPFLANZEN DER ALTSTAMMSORTEN. ['OLD STOCK VARIETIES' OF BLACK POPLAR HYBRIDS. IIG. KEY TO NURSERY PLANTS.] Holz-Zbl. 84(89): 1149 [G.]
Contains a dichotomous key to the 16 main 'old stock varieties' and some less common clones, based on the criteria previously discussed, and a second key showing the distinguishing characters of the 16 main varieties in relation to those resembling them most closely.

1960. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. II". VERFAHREN UND MÖGLICHKEITEN DER SORTENPRÜFUNG. ['OLD STOCK VARIETIES' OF BLACK POPLAR HYBRIDS. IIU. METHODS AND POSSIBILITIES OF VARIETY TESTING.] Holz-Zbl. 86 (150) : 2129-32. 13 refs. [G.]

Schwarz, H. 1951. BEITRAG ZUR KENNTNIS DER PAPPEL VON RAVERDEAU. [POPULUS CANADENSIS VAR. ERECTA.] Ost. Vjschr. Forstw. 92(4):276-80. 11 refs. [G.]
A brief description of the tree and its silvicultural requirements.

Soules, B. 1962. [CHARACTERISTICS OF EURAMERICAN POPLAR CLONES.] Das. Chron. 4(3):113-8. [Gk.]
Gives salient characters for 12 clones.

Tubeuf. 1933. NOTE OF P. CANESCENS HYBRID. Biol. Abstr. 7: 1729.

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Grohn, W. [1951.] DIE GRAUPAPPEL IN SCHLESWIG-HOLSTEIN. [POPULUS CANESCENS IN SCHLESWIG-HOLSTEIN.] Mitt. Dtsch. Dendrol. Ges. (Jb. 1950) No. 56: 64-6. [G.e.]

[Italy: Agricoltore Bresciano] 1962. [B2F, A POPLAR VARIETY OF GREAT MERIT.] Agricoltore Bresciano, Brescia 11(27): 2. [It.]
Describes this (patented) cultivar, thought to be a hybrid between a "Carolina" and a "Canadian" poplar. It has a well formed, cylindrical stem, and superior wood properties, is adapted to a wide range of sites, and resistant to most common poplar diseases.

Schwercin, v. 1919. POPULUS CHARKOWIENSIS, THE QUICKEST GROWING AND LIGHTEST WOODED OF ALL POPLARS. Mitt. Dtsch. Dendrol. Ges. 28: 143.

181.1

Anonymous. 1896. THE CANADIAN POPLAR IN CANADA. Bull. Soc. For. Belg. 3: 696.

181.2

[France: Serv. Cult. Etud. Peuplier et Saule] 1961. CLIMATOLOGIE ET POPULICULTURE. [CLIMATOLOGY AND POPLAR GROWING.]

Bull. Serv. Cult. Etud. Peuplier et Saule, Paris 1961(1;2):6-37; 7-49. [F.]

181.2/3

Pourtet, J. 1960. NOTE SUR LES VARIATIONS INDIVIDUELLES D'ACCROISSEMENT DES PEUPLIERS D'UNE PLANTATION MONOCLONALE. [INDIVIDUAL GROWTH VARIATION OF POPLARS IN A MONOCLONAL PLANTATION.] Rev. For. Franc. 12(1): 55-7. [F.f.]

Three plots, each of a single clone, planted 10 and 7 years ago in apparently uniform conditions, show increasing differences between trees within the plots. Trees appear sensitive to micro-variations in environment that instruments cannot record. The clones were 'robusta', 'virginie de frignicoust' and '1-214'.

181.21

Gunther, H. 1961. BEOBACHTUNGEN ÜBER DIE SCHATTENERTRAGLICHKEIT VERSCHIEDENER PAPPELSORTEN. [SHADE TOLERANCE OF DIFFERENT POPLAR VARIETIES.] Wiss. Abh. Dtsch. Akad. Landw.-Wiss., Berlin No. 52 (Beitr. Pappelforsch. No. 6) : 37-52. 3 refs. [G.g.russ.e.]

181.3

Rohrig, E. 1959. UNTERSUCHUNGEN ÜBER DAS JUGENDWACHSTUM "ON SCHWARZPAPPEL-HYBRIDEN AUF VERSCHIEDENEN STANDORTEN. [EARLY GROWTH OF BLACK POPLAR HYBRIDS ON DIFFERENT SITES.] Silvae Genet. 8(1):24-30. 17 refs. [G.g.e.f.]

181.31

Pourtet, J., and Turpin, P. 1958. L'INFLUENCE DE LA PROFONDEUR DU PLAN D'EAU ET DU TRAVAIL DU SOL SUR LA CROISSANCE DES PEUPLIERS. [THE INFLUENCE OF DEPTH OF WATER-TABLE, AND SOIL CULTIVATION ON THE GROWTH OF POPLARS.] Rev. For. Franc. 1958 (6): 415-8. [F.]

181.319

Roosen, P. 1955. LA TENEUR EN EAU DES TIGES DE PEUPLIERS EURAMERICAINS EN BELGIQUE. [THE WATER CONTENT OF STANDING STEMS OF HYBRID BLACK POPLARS IN BELGIUM.] Spec. Pap. 8th Sess. Int. Poplar Comm., Madrid 1954 No. FAO/CIP/75-D Add. 1: 53-66. 8 refs. [F.]

1957. LA TENEUR EN EAU DES TIGES DE PEUPLIERS EURAMERICAINS EN BELGIQUE. [WATER CONTENT OF STEMS OF HYBRID BLACK POPLARS IN BELGIUM.] Bull. Inst. Agron. Gembloux 25(112) : 179-97. 8 refs. [F.f.]

181.32

Giordano, A. 1959. NOTA PEDOLOGICA SUI TERRENI DELLA TENUTA NOBILI-NICHETTI. [A PEDOLOGICAL NOTE ON THE SOILS OF THE NOBILI-NICHETTI ESTATE.] Cellulosa e Carta 10(9) : 17-20. [It.f.e.g.]
Soil profiles were investigated, to determine the differences of soil, if any, between vigorous and poor poplar stands on deep sands. Growth was found to be closely correlated with humus content.

181.341

Giulimondi, G. 1960. RICERCHES PRELIMINARI SULLA NUTRIZIONE MINERALE DEL PIOPPO A MEZZO DELL'ANALISI FOLIARE. [THE USE OF FOLIAR ANALYSIS FOR THE INVESTIGATION OF MINERAL NUTRITION OF POPLAR.] Pubbl. Cent. Sper. Agric. For., Roma 4: 231-45. 12 refs. [It.it.e.]

1962. EFFECT OF HUMIC ACID ON THE ROOTING AND GROWTH OF POPLARS AND EUCALYPTS. Proc. 13th Congr. Int. Union For. Res. Organ., Vienna 1961, Pt. 2(1), Sect. 23/6, 7 pp. 19 refs. [E.e.]

Krauss, H. H. 1959. BEITRAG ZUR KENNTNIS DER WECHSELBEZIEHUNGEN ZWISCHEN DEN HAUPTNAHRSTOFFEN STICKSTOFF, PHOSPHORSAURE UND KALI BEI DER DÜNGUNG "ON FORSTPFLANZEN. [THE INTERACTION OF THE MAIN NUTRIENTS N, P AND K IN THE FERTILIZING OF FOREST PLANTS.] Arch. Forstw. 8(6/7) : 592-649. 22 refs. [G.g.russ.e.]

Liekens, H. 1960. GEBREKSVERSCIJNSELEN EN GROEIVERSCHILLEN BIJ POPULIEREN STEKKEN IN VERBAND MET DE HOOFDELEMENTEN IN DE VOEDING. [SYMPTOMS OF NUTRIENT DEFICIENCY AND DIFFERENCES

IN GROWTH OF POPLAR CUTTINGS IN RELATION TO THE MAIN ELEMENTS IN THE NUTRIENT SOLUTION.] *Agricoltura, Louvain* 8(4): 663-87. 15 refs. [Du.du.f.e.]

181.342

Jaro, Z. 1963. [STUDIES OF POPLAR SITES IN PUSZTAVACS.] *Erdo* 12(4): 145-50. [Hu.russ.g.]

Liani, A. 1960. DETERMINAZIONE DELLA CAPACITA DISCAMBIO CATIONICO DELLE RADICI DI PIOPPPO. [DETERMINATION OF THE CATION EXCHANGE CAPACITY OF POPLAR ROOTS.] *Pubbl. Cent. Sper. Agric. For.*, Roma 4: 127-38. 36 refs. [It.it.e.]

181.52

Gamble. 1897. FLOWERS OF P. CILIATA IN INDIA. *Indian For.* 23: 256.

181.521

Sauer, E. 1954. BEOBACHTUNGEN AN ZWITTRIGEN PAPPELN. [OBSERVATIONS ON ANDROGYNOUS POPLARS.] *Z. Forstgenet.* 3 (5): 89-91. 6 refs. [G.g.e.]

A study of the androgynous flowers of a young *Populus tremula* at Stuttgart. Mention is also made of the occurrence of androgynous flowers on an adult *P. alba* (or possibly *P. alba* × *P. canescens*) and a young *P. candicans*. [Cf. Seitz, 1954, *P. canadensis* to *P. davidiana*, 165.42.]

181.525

Marjai, Z. 1956. NYARMAG CSIRAZASFIZIOLOGIAI VIZSGALATOK. [GERMINATION-PHYSIOLOGICAL INVESTIGATIONS ON POPLAR SEEDS.] *Erdesz. Kutatas.*, Budapest 1956(3):95-109. 13 refs. [Hu.russ. e.g.]

181.61

Sauer, E. 1959. UBER DIE BEASTUNGSVERHALTNISSE VON 1-JAH-RIGEN BAUMSCHULPFLANZEN DER 16 WIRTSCHAFTSPAPPEL-ALTSORTEN. [BRANCHING IN 1-YEAR-OLD NURSERY PLANTS OF 16 OLD-ESTABLISHED COMMERCIAL POPLAR VARIETIES.] *Silvae Genet.* 8(6): 161-72. 2 refs. [G.g.e.f.]

Number of branches, height of first branch from the ground, length of branches, angle between branch and stem, and height of tree were measured on three individuals of each of 16 varieties of *Populus* × 'canadensis', and a statistical analysis of the data is presented and discussed.

181.62

Satoo, T., Kunugi, R., and Kumekawa, A. 1956. [MATERIALS FOR STUDIES OF GROWTH IN STANDS. 3. AMOUNT OF LEAVES AND PRODUCTION OF WOOD IN ASPEN (POPULUS DAVIDIANA) SECOND GROWTH IN HOKKAIDO.] *Bull. Tokyo Univ. For.* No. 52: 33-51. 26 refs. [Jap.jap.e.e.]

181.64

Petrescu, L. 1956. INFLUENTA SCHEMELOR DE PLANTARE ASUPRA SECTIUNILOR TRANSVERSALE LA PLOPII NEGRI HIBRIZI. [THE INFLUENCE OF PLANTING ARRANGEMENT ON CROSS-SECTIONAL FORM OF HYBRID BLACK POPLARS.] *Rev. Padurilor* 71(8):509-13. 5 refs.

[Rum.russ.g.]

Analysis of stem form in eight plantations showed that the amount of excentricity was directly related to the degree of irregularity in planting rows. In perfectly symmetrical plantations, excentricity, when it occurred, appeared to be always oriented in the same direction, depending upon the prevailing wind.

181.65

Anonymous. 1934. CROISSANCE RAPIDE D' PEUPLIER D' CANADA. [RAPID GROWTH OF CANADIAN POPLAR IN BELGIUM.] *Bull. Soc. For. Belg.* 41: 205. [F.]

Miegroet, M. van. 1961. ETUDE MORPHOLOGIQUE DE QUELQUES TYPES DE PEUPLIERS AU STADE JUVENILE. [A MORPHOLOGICAL STUDY OF SOME TYPES OF POPLAR IN THE JUVENILE STAGE.] *Bull. Soc. For. Belg.* 68(4): 225-39. [F.]

Ow, L. von. 1957. DER VERLAUF DES JAHRLICHEN HOHENWACHSTUMS "ON PAPPELN. [THE SEASONAL RHYTHM OF HEIGHT GROWTH IN POPLARS.] *Forst- u. Holzw.* 12(12):202-3. 1 ref. [G.]

181.71

Lassen, E. 1955. EN STOR GRAAPOPPEL. [A LARGE SPECIMEN OF POPULUS CANESCENS.] *Dansk Skovforen. Tidsskr.* 40(6): 271-8. [Dan.]

Gives the dimensions and increment data of a tree ca. 220 years old (d.b.h. 565 cm., ht. 33 m.), growing near Stenderup; the stem snapped in Aug. 1952 as a result of decay.

181.75

Sebald, O. 1960. UNTERSUCHUNGEN UBER DIE BLATTNERVATUR-DICHTE VERSCHIEDEN ALTER PAPPELKLONE. [THE VENATION DENSITY OF LEAVES FROM POPLAR CLONES OF DIFFERENT AGES.] *Mitt. Ver. Forstl. Standortskunde Forstpfl.Zucht.* No. 9: 72-4. 11 refs. [G.g.]

181.8

Marcet, E. 1956. DIE PHANOLOGIE ALS BESTIMMUNGSMERKMAL BEI PAPPELSORTEN. [PHENOLOGY AS A DISTINGUISHING CHARACTER OF POPLAR VARIETIES.] *Ber. Schweiz. Bot. Ges., Zurich* 66: 5-18. 8 refs. [G.g.]

Ruggeri, C. 1960. ATTIVITA CAMBIALE IN POPULUS × EURAMERICANA CV. '1214'. [CAMBIAL ACTIVITY IN P. × 'CANADENSIS' CV. '1214'.] *Pubbl. Cent. Sper. Agric. For.*, Roma 4: 151-64. 7 refs. [It.it.e.]

Tucovic, A. 1955. EUROAMERICKE TOPOLE (POPULUS EURAMERICANA) U BEOGRADU I OKOLINI. [HYBRID BLACK POPLARS (P. × EURAMERICANA) IN BELGRADE AND ITS ENVIRONS.] *Glasn. Sum. Fak., Beograd* No. 10: 129-47. 30 refs. [Serb.g.g.]

187 VEGETATION TYPES

Panin, P.S. 1960. NEKOTORYE OSOBENNOSTI RASTITEL'NOGO POKROVA KASGARII. [SOME FEATURES OF THE VEGETATION OF THE KASHGAR [SINKIANG-UIGHUR AUTONOMOUS REGION. CHINA].] *Bot. Z.* 45(4): 583-8. [Russ.]

Describes three main soil/vegetation zones, and the tree vegetation, which consists mainly of *Populus diversifolia* and *Tamarix* sp.

2 SILVICULTURE

Bernardini, F. 1948. LA COLTURA DEL PIOPO DEL CANADA NELLE GOLENE APERTE DEL PO. [THE CULTIVATION OF "CANADIAN" POPLAR ON THE UNENCLOSED MUDBANKS OF THE RIVER PO.] *Ital. Agric.* 85(1): 55-63. 4 refs. [It.]

Gerhard, H. 1959. DIE GRAUPAPPEL "ND IHRE ANBAUMOGLIKHEITEN IN NORDWEST DEUTSCHLAND. [POSSIBLE USES FOR POPULUS CANESCENS IN NORTHWEST GERMANY.] *Holzzucht, Reinbek* 13(4): 25-7. [G.]

Recommends the species for gaps in the forest, for wind protection, roadsides, etc., and discusses propagation, systematic position, etc. [Cf. Grohn, 1955, *P. canadensis* to *P. davidiana*, 266.1

[Germany: Mitt. Dtsch. Dendrol. Ges.] 1919. REVIEW OF MAJERSZKY. CULTURE OF P. CANADENSIS. (Hungry.) *Mitt. Dtsch. Dendrol. Ges.* 28: 342.

Gutschick. 1937. THE SILVICULTURAL TREATMENT OF CANADIAN POPLAR. *Wiener Allg. Forst- u. Jagdztg.* 55(13): 59. [G.]

Kern. 1905. CULTIVATION OF P. CANADENSIS. *Mitt. Dtsch. Dendrol. Ges.* 14: 442.

Peschaut. 1931. CULTIVATION OF P. CANADENSIS IN LIGHT OF PRESENT FORESTRY CONDITIONS. *Wiener Allg. Forst- u. Jagdztg.* 49: 200.

Schelling, E. von, and Rohmeder, E. 1944. DIE KANADISCHE PAPPEL IM GRAFLICH "ON PREYSINGSCHEN FORSTREVIER MOOR. ["CANADIAN" POPLAR ON THE MOOR OF THE "ON PREYSING FOREST DISTRICT.] *Dtsch. Forstw.* 1944(9110; 13/14), 4 pp. [G.]

A brief history of the stands of *Populus 'canadensis'* in this area

and a short account of the present state of the *stands* with notes on propagation maintenance, protection, and *yield*.

Schmitz-Lenders, B. 1956. MEINPAPPEL-TESTAMENT. [MY POPLAR TESTAMENT.] J. D. Sauerlanders Verlag, Frankfurt a./M. 188 pp. 87 refs. [G.]

Seth, S. K. and Desarker, B. K. 1960. POPLAR CULTIVATION. Indian For. 86(1): 21-7. 19 refs.

A general account of *poplar growing in Europe and America*, with more detailed notes on the indigenous Indian species, *Populus euphratica* and *P. ciliata*.

Walther. 1895. NOTE ON CULTIVATION OF CANADIAN POPLAR IN GERMANY. Allg. Forst- u. Jagdztg. 71: 67-9.

231.5

Clonaru, A. 1960. CONTRIBUTII LA CUNOASTEREA REGENERARII VEGETATIVE A PLOPILORNEGRIREPEDECRESCATORI. [THE VEGETATIVE REPRODUCTION OF QUICK-GROWING BLACK POPLARS.] Lucrari Stiintifice, Institutul Politehnic, Orasul Stalin (Ser. Silv.) 4: 115-32. 7 refs. [Rum.russ.f.]

232.1

Anonymous. 1923. P. CANADENSIS IN SWITZERLAND. J. For. Suisse 74: 206.

_____. 1929. VALUE OF P. CANADENSIS FOR PLANTING. Dtsch. Forstztg. 44: 4.

Bakkay, L. 1955. A SZURKENYARSZEREPE AZ ERDOKHOZAMANAK FOKOZASABAN. [THE ROLE OF THE GREY POPLAR IN INCREASING THE YIELD OF FORESTS.] Erdo 4(5): 185-91. [Hu.]

P. canescens, hitherto neglected because its discolored *heartwood* was not suitable for paper-making, is suitable for fibreboard. Its planting should be encouraged and breeding should aim at the elimination of the *heart defect* and of *bole sweep*. From abstr. in Hung. Agric. Rev. 4(3):7. 1955.

Koltay, G. 1953. CSEMETEKERTJEINK NYARSZAPORITO ANYAGA. [THE POPLAR PLANTING STOCK IN OUR FOREST NURSERIES.] Erdo 2(1): 42-9, 110. [Hung.g.]

Meiden, H. A. van der. 1962. DE PRAKTISCHE BETEKENIS "AN VERSCHILLENDE POPULIERECULTIVARS. [THE PRACTICAL IMPORTANCE OF DIFFERENT POPLAR CULTIVARS.] Ned. Boschb.-Tijdschr. 34(1): 20-8. 12 refs. [Du.e.e.]

The *first part* discusses general considerations with reference to the *cultivars* commonly grown in the Netherlands. The *second part* considers the susceptibility of *Populus* × *serotina* to disease and especially to crown dieback (primary cause unknown), which makes it unsuitable for general planting.

_____. 1962. DE PRAKTISCHE BETEKENIS "AN VERSCHILLENDE POPULIERECULTIVARS. III. I". [THE PRACTICAL IMPORTANCE OF DIFFERENT POPLAR CULTIVARS. III, IV.] Ned. Boschb.-Tijdschr. 34(3): 120-30. 11 refs. [Du.e.]

_____. 1962. DE PRAKTISCHE BETEKENIS "AN VERSCHILLENDE POPULIERECULTIVARS. V. POPULUS CANADENSIS CV. ROBUSTA. [THE PRACTICAL IMPORTANCE OF DIFFERENT POPLAR CULTIVARS. V. P. × CANADENSIS CV. 'ROBUSTA'.] Ned. Boschb.-Tijdschr. 34(4): 139-44. 11 refs. [Du.e.]

Thirty-five percent of all certified poplar plantations in the Netherlands consist of 'Robusta' (including cvs. 'Zeeland', 'Bachelieri' and 'Vernirubens'). Its resistance to diseases and wind damage, silvicultural characteristics and wood are briefly discussed.

_____. 1962. [THE PRACTICAL IMPORTANCE OF DIFFERENT POPLAR CULTIVARS. "I. POPULUS × CANADENSIS CV. HEIDEMIJ. VII. P. × CANADENSIS CV. SEROTINA ERECTA (= 'REGENERATA').] Ned. Boschb.-Tijdschr. 34(8): 308-19. 18 refs. [Du.e.e.]

_____. 1962. [THE PRACTICAL IMPORTANCE OF DIFFERENT POPLAR CULTIVARS. "III. SOME RARELY-PLANTED CULTIVARS. IX. SUMMARY.] Ned. Boschb.-Tijdschr. 35(1): 14-22. 5 refs. [Du.e.] VIII. *Populus* 'cnnadensis' cvs. I 214 and Keppels glorie (= *Serotina* de Champagne). IX. A review of the value and properties of the *cultivars* already discussed, stressing the need to increase the use of *cultivars* other than 'Gelrica' and 'Robusta,' which make up nearly 60% of poplars planted annually in the Netherlands.

232.1 1

Benassi, L. 1946. ACCRESCIMENTO IN ALTEZZA DELLE PIANTE DI PIOPOCANADESE E UN'A NORMA COLTURALE. [HEIGHT INCREMENT OF "CANADIAN" POPLAR PLANTS AND A PLANTING STANDARD.] Ital. For. Mont. 1(5): 222-3. [It.]

Chizzali, F. 1957. RESULTADOS DE 5 AÑOS DE FORESTACION CON SALICACEAS, EN TIERRA FIRME, EN LA PROVINCIA DE SANTA FE. [RESULTS OF 5 YEARS' AFFORESTATION WITH SALICACEAE ON DRY LAND IN SANTA FE PROVINCE.] Rev. For. Argent. 1(1): 15-25. [Span.]

Georgopoulos, A. 1953. SYMBOLE STEN KALLIERGEIA TES LEUKES IDIAITERA STEN HELLADA. [POPLAR CULTIVATION WITH PARTICULAR REFERENCE TO GREECE.] Dasos 7(23/24): 6-32. 17 refs. [Gk.f.] Includes an account of the striking early development of imported clones (Italian and French) of *P. × euramericana* in various Greek nurseries and sites; data on survival, height growth, and insect susceptibility are tabulated. The Greek climate favors a long growing season. [Cf. Georgopoulos, 1952, *Populus* sp., 232.43.]

Guerreiro, M. G. 1956. O CULTIVO DO CHOUPO E A IRRIGACAO DE ALEUTEJO. [POPLAR CULTIVATION AND THE IRRIGATION OF LAND SOUTH OF THE TAGUS.] Agros 39(2): 63-74. [Port.] Discusses the suitability of poplar for this region and presents some figures for timber production from *Populus* 'euramericana' in Italy.

Jovanovic, S. 1951. PODIZANJE TOPOLOVIH KULTURA. [GROWING POPLARS.] Sumarstvo 4(6): 349-58. [Serb.f.]

Ponticelli, P. 1954. PIOPPICOLTURA MERIDIONALE. [CROWING POPLAR IN THE SOUTH.] Cellulosa e Carta 5(11): 9-11. [It.f.e.] Describes an *experimental* plantation of poplar (clone I 214) in the province of Salerno, where poplar has not hitherto been much planted. Particular emphasis is laid on the spacing (6 × 6 m.) which was much wider than usual in central and southern Italy (1.5 × 1.5 m.), staking, and cultivation of garden crops between the rows.

Zappi, C. V. 1958. OBSERVACIONES SOBRE EL COMPORTAMIENTO Y CRECIMIENTO DEL POPULUS EURAMERICANA "MONILIFERO" EN EL DELTA DEL PARANA. [THE BEHAVIOR AND GROWTH OF P. × CANADENSIS "MONILIFERO" IN THE PARANA DELTA.] Rev. For. Argent. 2(4): 123-6. [Span.]

232.13

Bruckmann, H. H. 1957. OBSERVACIONES EPIDOMETRICAS SOBRE ESPECIES E HIBRIDOS DE POPULUS EN EL PARANA MINI, ISLAS DEL DELTA DEL PARANA. [GROWTH STUDIES ON POPLAR SPECIES AND HYBRIDS IN PARANA MINI, ISLANDS OF THE PARANA DELTA.] Rev. For. Argent. 1(4): 136-9. [Span.]

Dathe, A. 1959. DIE ANBAUWURDIGKEIT DER ITALIENISCHEN PAPPELKLONE IN DEUTSCHLAND. [THE SUITABILITY OF THE ITALIAN POPLAR CLONES FOR PLANTING IN GERMANY.] Allg. Forstzeitschr. 14(41): 715-8. [G.g.]

Elsner, F. 1960. ERGEBNISSE DER BAYERISCHEN PAPPELSORTEN-PROBEANBAUTEN 1951. [RESULTS OF THE BAVARIAN POPLAR VARIETY TRIALS, 1951.] Holz-Zbl. 86(49): 700-2. [G.g.]

Georgiev, Z. 1960. O PRODUKTIVNOSTI TOPOLEJ V LESAH BOLGARIJ. [YIELDS OF POPLARS IN BULGARIA.] Vestn. Sel'.-Hoz. Nauki 5(3): 124-6. [Russ.e.g.f.]

Tabulates data on standing volume and volume c.a.i. for some plantations of *Populus* × *regenerata*, *P. × marilandica*, and *P. × serotina* at various ages and on various sites in Bulgaria.

Glisic, M. V. 1963. [PRELIMINARY RESULTS OF RAISING FAST-CROWING EURAMERICAN HYBRID POPLARS ON ALLUVIAL SOILS OF LARGE RIVERS.] Sumarstvo 16(1/2): 41-7. 10 refs. [Serb.f.] Cuttings of *P. × regenerata*, P. I-214, and P. I-154 planted directly in three sub-plots showed that P. I-154 gives greater height and diameter growth in the first 2 years than P. I-214, and P. I-214 greater than P. × *regenerata*. Studies are continuing.

Graves, P. F., Hamilton, L. S., and Fedkiw, J. 1958. CAROLINA POPLAR PLANTATION YIELDS 55 CORDS PER ACRE AT 25 YEARS. J. For.

56(1): 38-9.

In spring 1930, 1,000 rooted cuttings were planted at 6×6 ft. spacing on a lake-side site in New York State that is flooded for 2-3 weeks each year in spring. After 25 years, 299 survived with a computed b.a./acre of 199.5 sq. ft. and mean d.b.h. of 10.4 in., mean ht. to 4-in. top 52 ft. Trees are of excellent form and natural pruning has been good. The identity of this poplar is uncertain (possibly *Populus ×eugenei* or *P. ×robusta*).

Icnaka, H., and Hatano, K. 1962. DIE BEDEUTUNG DER PHOTO-PERIODE FÜR DEN ANBAU DER EINGEFÜHRTEN BASTARDPAPPELN. [THE IMPORTANCE OF PHOTOPERIOD IN THE CROWING OF INTRODUCED HYBRID POPLARS.] J. Jap. For. Soc. 44(1): 15-8. 4 refs. [G.g.jap.]

Lara, L. F. de S. 1959. ELEMENTOS DE ESTUDO PARA CONHECIMENTO DE ALGUNS "CLONES" DE CHOUPO. [PRELIMINARY STUDIES OF SOME POPLAR CLONES.] Estud. Inform. Serv. Flor. Aquic. Portugal No. 108-A3, 5 pp. [Port.]

Gives the results of a preliminary study of the development of 10 different clones, mainly hybrid black poplars, in the nursery over the first 6 months. Height and diameter measurements of 50 individuals are presented, along with climatic data. The plants were watered weekly.

May, S. 1958. SVILUPPO DI ALCUNI CLONI NEL PIOPPETO SPERIMENTALE DI TORVISCOSA. [DEVELOPMENT OF SOME CLONES IN THE EXPERIMENTAL POPLAR PLANTINGS AT TARVISCOSA.] Cellulosa e Carta 9(2): 9-12. [It.f.c.g.]

Meiden, H. A. van der, and Woltcrson, J. F. 1960. HET PROBLEEM "A N CULTIVAR EN KLOONBIJ POPULIER. [THE PROBLEM OF [THE CHOICE OF] POPLAR CULTIVARS AND CLONES [FOR MARKETING IN THE NETHERLANDS].] Ned. Boschb.-Tijdschr. 32 (5/6): 160-83. 8 refs. [Du.du.e.e.f.] Reprinted as Korte Meded. Bosbouwproefsta., Wageningen No. 41. 1960.

Miletic, S. 1960. ITALIJANSKI KLONOVI TOPOLA NA PODRUCJU L.S.G. "KOSUTNJAK"—BILJE. [ITALIAN CLONES OF POPLAR IN THE REGION OF THE "KOSUTNJAK" GAME AND FOREST ESTATE AT BILJE [CROATIA].] Topola, Beograd 4(13/14): 14-6. 1 ref. [Serb.f.] Describes the introduction and performance of Italian clones in Yugoslavia since 1956. Clones 214 and CBD (Cartiers Beniamino Donzelli) are considered particularly suitable for large-scale use, as they are resistant to disease and grow faster than native species.

Milovanovic, M. 1960. PODACI O USPEVANJU NEKIH ITALIJANSKIH KLONOVA TOPOLA U DONJEM PODUNAVLJU. [DATA ON THE SUCCESS OF SOME ITALIAN CLONES OF POPLAR IN THE LOWER DANUBE REGION.] Topola, Beograd No. 17/18: 8-11. [Serb.f.]

Pokorny, J. 1957. POKUSNA PLOCHA EUROAMERICKYCH TOPOLU NA CERNOKOSTELECKU. [THE CERNOKOSTELECK EXPERIMENTAL AREA OF HYBRID BLACK POPLARS.] Prace Vyzkum. Ust. Lesn. CSR No. 12: 113-27. [Cz.russ.f.]

Saatcioglu, F. 1953. DIE BEDEUTUNG DES PAPPELHOLZES UND UBER ANBAUVERSUCHE MIT RASCHWUCHSIGEN PAPPELBASTARDEN IN DER TURKEI. [THE IMPORTANCE OF POPLAR WOOD AND SILVICULTURAL RESEARCH ON QUICK GROWING POPLAR HYBRIDS IN TURKEY.] Schweiz. Z. Forstw. 104(7,8): 289-96. [G.g.f.]

The importance of poplar for the pulp industry is stressed. Clones imported from Italy (*P. euramericana* IT 214 ♀ and 154 ♂) have been widely used. The pulp industry has now developed a new clone named *P. euramericana* Turkey Sumer I ♂, which is said to give good results. Growth data are given for these three clones.

Spalck, V., and Mottl, J. 1960. SORTIMENT TOPOLUVHODNY PRO VYSADBY VCESKYCH KRAJICH. [VARIETIES OF POPLAR SUITABLE FOR PLANTING IN VARIOUS PARTS OF CZECHOSLOVAKIA.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 6(10): 819-34. 6 refs. [Cz.cz.russ.e.]

232 22

Dobronic, D. 1962. [SOME EXPERIMENTS ON THE REDUCTION IN YIELD OF WHEAT AND MAIZE CAUSED BY THE SHADE OF POPLARS IN POPLAR PLANTATIONS RAISED WITH AGRICULTURAL CROPS.] Topola, Beograd 6(28): 54-6. 2 refs. [Serb.serb.f.f.]

In a 4-year plantation of *Populus ×marilandica* and *P. ×sero-*

tina planted at 3×3.5 m. spacing, yields of maize were reduced by 55.9% and wheat by 38.3% vs. those in the open. The author proposes that maize should be grown during the first 3 years, wheat during the next 2, and a mixture of grass and clover during the next 3.

232.3 15.2

Marjai, Z. 1955. NYARMAGTAROLASIKISERLETEK. [INVESTIGATIONS ON THE STORAGE OF POPLAR SEEDS.] Erdesz. Kutatas., Budapest 1955(4): 111-126. 5 refs. [Hu.russ.e.g.]

1955. EGYES KULSO TENYEZOK HATASA A NYARMAGRA. [THE INFLUENCE OF SOME EXTERNAL FACTORS ON POPLAR SEEDS.] Erdesz. Kutatas., Budapest 1955 (1): 63-81. 10 refs. [Hu.russ.e.g.]

232.318

Jovanovic, B., and Tucovic, A. 1960. ZAPAZANJA O DEJSTVU JONIZUJUCEG ZRACENJA NA SEME NEKIH EURAMERICKIH TOPOLA. PRETHODNO SAOPSTENJE. [THE EFFECT OF IONIZING RADIATION ON THE SEEDS OF SOME EURAMERICAN POPLARS. PRELIMINARY REPORT.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No 1: 59-87. 7 refs. [Serb.f.]

232.32

Crvcencanin, M. 1960. NEKAISKUSTVA KO" PODIZANJARASADNIKA KLONA I-214 U ZLATNOJ GREDI LOVNO-SUMSKOG GOSPODARSTVA "KOSUTNJAK." [EXPERIENCE GAINED DURING THE ESTABLISHMENT OF A NURSERY OF CLONE I-214 AT ZLATNAGREDA, KOSUTNJAK GAME AND FOREST ESTATE [BILJE, CROATIA].] Topola, Beograd No. 17/18, 4-8. [Serb.f.]

The nursery, on an area of 4.3 ha, contains 200,000 *Populus × canadensis* cu. 'I-214' plants from imported Italian stock. The first year's work (including site preparation, planting of cuttings, tending, irrigation, protection, etc.) is described, with data on height growth during the first growing season, and general recommendations.

Pcschaut, R. 1947. DIE NACHZUCHT DER KANADA-UNDRUBSTA-PAPPEL IM PFLANZGARTEN. [NURSERY PRACTICE FOR "CANADIAN" AND RUBUSTA POPLARS.] Allg. Forst- u. Holzw. Ztg. 58(11/12): 92-4. [G.]

Radulescu, A. V. 1948. CERCETARI PRIVIND DISTANTELE DE SADIRE IN PEPINIERA A BUTASILOR DE PLOPIDE CANADA. [STUDIES IN THE SPACING OF CANADIAN POPLAR CUTTINGS IN NURSERIES.] Rev. Padurilor 63(1): 1-4. [Rum.f.]

232.323.2

Partos, G. 1955. FEHER- ES SZURKENYAR-CSEMETEK MAGROL NEVELESE [RAISING WHITE AND GREY POPLAR SEEDLINGS.] Erdesz. Kutatas., Budapest 1955(2): 155-63. [Hu.russ.e.g.] To allow for culling, 0.5-0.7 g. (1.0-1.5 cc.)/sq.m. should be sown, to yield 30 seedlings with a collar diameter of 4 mm. Natural suppression of the rest occurs early. If density is 70/sq.m., artificial thinning (to 20-25 stems sq.m.) appears necessary only if particularly strong plants are required; it should be done when dominants are 25-35 cm. high.

232.324.1

Vidali, E. [1962.] [MECHANICAL EQUIPMENT USED IN POPLAR NURSERIES AND PLANTATIONS.] Proc., 5th World For. Congr., Seattle 1960 Vol. 1 (Sect. 1): 630-4. [F.e span.] Briefly describes the Lamatalpa and *Populus* lifting ploughs. With the latter a tractor driver and one worker lifted 1,000 two-year-old poplars near Casale Monferrato in 40 minutes. Some performance data are also given for the small Kiekens Dekker 508 D and the K.D. Goliath tractor-drawn sprayers, which respectively treated 1- and 2-year poplars at $1\frac{1}{2}$ hr./ha. and mature poplars spaced 6×6 m. at ca. 1 hr./ha.

232.328

Anic, M. 1948. O UZGOJN SADNICA KANEDSKE TOPOLE IZ REZNICA. [PROPAGATING HYBRID BLACK POPLARS FROM CUTTINGS.] Glasn. Sumske Pokuse 9: 121-56. 23 refs. [Croat.e.]

Frohlich, H. J. 1957. DIE VEGETATIVE VERMEHRUNG "ON ASPE UND GRAUPAPPEL UND IHRE BEDEUTUNG FÜR DEN WALDBAU. [VEGE-

TATIVE PROPAGATION OF ASPEN AND GREY POPLAR AND ITS IMPORTANCE FOR SILVICULTURE] *Allg. Forstzeitschr.* 12(14/15): 197-8. 3 refs. [G.]

Jenko, V. 1958. VEGETATIVNO RAZMOZEVANJE SIVEGA TOPOLA. [VEGETATIVE PROPAGATION OF POPULUS CANESCENS.] *Gozd. Vestn.* 16(2/3): 51-6. 5 refs. [Sloven.]
A short, illustrated, general account, based mainly on German literature.

——— 1958. VEGETATIVNO RAZMNANJE SIVE TOPOLE. [VEGETATIVE PROPAGATION OF POPULUS CANESCENS.] *Topola*, Beograd No. 5: 357-61. 2 refs. [Serb.f.]
Describes two methods. (a) taking root cuttings from the rootstock of felled trees. (b) stimulating shoot development from annual buds by layering 1-year-old coppice shoots from an old rootstock.

232.328.1

Biolcev, A. 1956. KACESTVA NA LETORASTITE ZA REZNICI OT KANADSKA I PIRAMIDALNA TOPOLA V ZAVISIMOST OT GASTOTATA NA PANCETATA-MAJKI. [THE QUALITY OF SHOOTS FOR CUTTINGS OF POPULUS $\times$ 'CANADENSIS' AND P. NIGRA VAR. ITALICA IN RELATION TO THE SPACING OF THE PARENT STOOLS.] *Nauc. Trud. Lesoteh. Inst., Sofia* No. 4: 87-99. 4 refs. [Bulg.russ.]
The optimum stool spacing, for producing shoots 15-18 cm. long and 7-10 mm. thick, was 60-70 cm. for *P. canadensis*, and 50 cm. for *P. nigra* var. *italica*.

Bokor, R. 1954. ADATOK A FEHER ES SZURKENYAR VEGETATIV SZAPORITASANAK KERDESEHEZ. [CONTRIBUTIONS TO THE PROBLEM OF THE VEGETATIVE PROPAGATION OF POPULUS ALBA AND P. CANESCENS.] *Erdesz. Kutatas., Budapest* 1954(1): 18-25. [Hu.?] *From abstr. in Hung Agric. Rev.* 3(3): 8. 1954. [E.]

Chardenon, J., and Taris, B. 1963. [EFFECTS OF GIBBERELLIC ACID ON POPLAR CUTTINGS.] *C. R. Acad. Agric. France* 49(12): 1070-7. 5 refs. [F.]

Chiang, W. -J. 1963. [ON GROWING POPULUS "CANADENSIS" BY CUTTINGS.] *Sci. Silvae, Peking* 8(2): 175-9. [Chin.]

Gunther, H. 1959. DIE ABHANGIGKEIT DES STECKLINGERTRAGES VON DER VERBANDSWEITE, DER LANGE DER AUSGANGSSTECKLINGE UND DER RUTENZAHL AM WURZELSTOCK BEI DER ANLAGE "ON PAPPELMUTTERQUARTIEREN. [THE INFLUENCE OF SPACING, LENGTH OF ORIGINAL CUTTINGS AND THE NUMBER OF SHOOTS PER STOOL ON THE YIELD OF CUTTINGS IN POPLAR STOOL-BEDS] *Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin* No. 40 (Beitr. Pappelforsch. III): 7-80. 11 refs. [G.g.e.russ.]

Harmath, B. 1961. UZEMI NYARDUGVANYOZASI KISERLETEK TAG HALOZATBAN. [NURSERY SPACING TRIALS WITH POPLAR CUTTINGS.] *Erdo* 10(10): 452-6. 6 refs. [Hu.hu.russ.g.]

Heitmüller, H. -H. 1954. VEGETATIVE VERMEHRUNG UNTER VERWENDUNG VON WUCHSATOFFEN BEI POPULUS CANESCENS SMITH UND POPULUS TREMULA L. [VEGETATIVE PROPAGATION OF P. CANESCENS AND P. TREMULA WITH THE AID OF GROWTH REGULATORS.] *Abstr. in Z. Forstgenet.* 3(6): 135-6. [G.]

Izuka, T. 1956. [THE RESPONSE OF CUTTINGS, MORE PARTICULARLY THEIR ROOTING, TO THE METHOD OF GROWTH-REGULATOR APPLICATION.] *Trans. 66th Mtg. Jap. For. Soc., pp.* 88-9. [Jap.]

[Jugoslavia.] 1950. O USGOJU KANADSKO TOPOLE IZ REZNICA. (NEKOLIKO PRETHODNIH ZAPAZANJA PRAKTICARA.) [REARING "CANADIAN" POPLAR FROM CUTTINGS. (SOME PRELIMINARY OBSERVATIONS OF A PRACTICAL FORESTER)] *Sum. List* 74(12): 505-8. [Croat.]

Podhorski, I. 1951. VEGETATIVNO RAZMNANJE TOPOLA SPOJENIM RESNICAMA I SVINUTIM PRUTOVIMA. [THE VEGETATIVE PROPAGATION OF POPLAR BY (1) NOTCHGRAFTED [STEM] CUTTINGS AND (2) BENT SHOOT-CUTTINGS.] *Sum List* 75(3/4): 157-64. [Croat.e.]

Rubtsov, S., and Bindu, C. 1956. NOI PERSPECTIVE IN INMUL-TUREA VEGETATIVA A PLOPILOR NEGRI HIBRIZI IN PEPINIERA. [A NEW METHOD FOR VEGETATIVE PROPAGATION OF HYBRID BLACK POPLARS IN THE NURSERY.] *Bul. Sti. Acad. Repub. Rom. (Sect. Biol.)* 8(2): 381-405. 5 refs. [Rum.russ.f.f.]
The use of very short (6- to 8-cm.) cuttings, planted horizontally,

gave very good results. The process of callus- and root-formation are described in detail with numerous drawings. Treatment of cuttings with an emulsion of honey increased the take from 25 to 72.5%; treatment with a heteroauxin was less successful. Plants obtained in this way from short cuttings closely resembled seedlings.

Zabielski, S. 1960. WPLYW WILGOTNOSCI ZRZEWOW TOPOLOWYCH NA PROCENT ICH PRZYJECIA. [THE INFLUENCE OF THE MOISTURE CONTENT OF POPLAR CUTTINGS ON THE PERCENTAGE TAKE.] *Las Polski* 34(9): 6-7. [Pol.]
Cuttings of *Populus* $\times$ *robusta* and *P. $\times$ regenerata* gave best survival percent when soaked for 48 hours before planting; soaking for 24 hours also gave much better results than no soaking at all. Thick cuttings (9-12 mm. diam.) gave better survival than thin (7-9 mm.) ones.

Zufa, L. 1962. [SILVICULTURAL, BIOLOGICAL AND ECONOMIC ASPECTS OF THE RAISING OF POPLAR PLANTS HAVING 2-YEAR SHOOTS ON 3-YEAR OR 2-YEAR ROOTS.] *Topola*, Beograd 6(25/26): 2-7. 2 refs. [Serb.f.]
Concludes, on a basis of a detailed analysis of quality and costs, that young stock provides better material for vegetative propagation than old stools, and that nursery production of plants having a 2-year shoot on 3-year roots (grown for 2 years in a transplant bed from 1-year-old stumped rooted cuttings) is qualitatively and economically superior to that of plants having a 2-year shoot on 2-year roots (produced without transplanting). [Cf. Sekawin, 1953, *Populus* sp.; 232.328.1.]

232.328.1 /2

Mutibaric, J. 1961. UTICAJ TOPOFIZISA NA GAJENJE TOPOLOVIH SADNICA. [INFLUENCE OF TOPOPHYSIS ON THE RAISING OF POPLAR PLANTS.] *Topola*, Beograd 5(22/23): 15-6. 2 refs. [Serb.serb.f.]

232.328.2/3

Schrock, O. 1958. DIE GRAUPAPPEL UND IHRE VEGETATIVE VERMEHRUNG. [POPULUS CANESCENS AND ITS VEGETATIVE PROPAGATION.] *Zuchter* 28(2): 71-80. 15 refs. [G.g.]

Seitz, F. W. 1960. DIE VERMEHRUNG DER GRAUPAPPEL. [PROPAGATION OF POPULUS CANESCENS.] *Holzzucht, Reinbek* 14(3/4): 19. [G.]

232.328.4

Partos, G. 1956. A FEHER ES A SZURKENYAR VEGETATIV SZAPORITASA. [THE VEGETATIVE PROPAGATION OF WHITE AND GREY POPLARS.] *Erdesz. Kutatas., Budapest* 1956(4): 167-73. 4 refs. [Hu.russ.e.g.]

232.4

Jobling, J. 1960. ESTABLISHMENT METHODS FOR POPLARS. *For. Rec. For. Comm., Lond.* No. 43, 16 pp.

232.41 1

Jobling, J. 1953. ESTABLISHMENT OF POPLARS. *Rep. For. Res. For. Comm., Lond.* 1951/52: 72-5.

Meiden, H. A. van der, and Overbeek, J. L. F. 1960. MOGELIJKHEDEN IN DE KEUS "AN POPULIERPLANTSOEN. [CHOICE OF PLANTING MATERIAL OF POPLAR.] *Ned. Boschb.-Tijdschr.* 32(5/6): 184-207. 6 refs. [Du.du.e.e.]
Reprinted as *Korte Meded. Bosbouwproefsta., Wageningen* No. 42. 1960.

——— and Overbeek, J. L. F. 1960. POSSIBILITIES IN THE CHOICE OF POPLAR PLANTING MATERIAL. *Transl. For. Comm., Lond.* No. 116, 20 pp. 1961. 6 refs.
Transl. by A. Woods from Ned. Boschb.-Tijdschr. 32(5/6): 184-203. Not for publication.

Olbrich, A. 1950. DIE PAPPELSTUMMELPFLANZUNG. [PLANTING OF POPLARS AS CUT-BACK STOCK.] *Holzzucht, Reinbek* 10: 77. [G.]
Suggests the use of 1-year-old stock raised from cuttings spaced 25 $\times$ 15 cm. in the nursery and cut back to the lowest bud on lifting (shoots to be used again as cutting material). Such plants would usually not need root pruning and the planting hole could be 40 $\times$ 40 $\times$ 30 cm. This might reduce costs to 1/5 of those for the usually 2-year plants raised at a spacing of 25 $\times$ 70 cm. and planted in a hole 50 $\times$ 50 $\times$ 40 cm.

232.42

Aird, P. L. 1956. FERTILIZERS IN FORESTRY AND THEIR USE IN HARDWOOD PLANTATION ESTABLISHMENT. Pulp Paper Mag. Can. 57(3): 376-384. 10 refs. (Woodl. Sect. Index Canad. Pulp Paper Ass. No. 1542.)

Jobling, J. 1961. RECENT DEVELOPMENTS IN POPLAR PLANTING. Quart. J. For. 55(4): 287-92. 2 refs.

Briefly reviews Forestry Commission experiments which indicate that hybrid black poplars planted in holes made by explosive cartridges grow more vigorously (for the first 4 years at least) than those in normal hand-dug pits. Also discusses the use of very deep or very large planting pits and of post-hole borers in Italy.

232.421

Grut, M. 1962. DEEP-PLANTING OF POPLARS. J. S. Afr. For. Ass. No. 40: 19-22.

Describes the Italian method of planting poplar cuttings in holes made to reach groundwater level [cf. May, below].

May, S. 1959. LA TENUTA AGRARIA NOBILI-NICHETTI CULLA DI UN ORIGINALE SISTEMA DI COLTIVAZIONE DEL PIOPPO. [THE NOBILI-NICHETTI ESTATE, CRADLE OF AN ORIGINAL SYSTEM OF POPLAR-GROWING.] Cellulosa e Carta 10(9): 5-16. 4 refs. [It.g.e.f.]

Mesnil, H. 1960. PLANTATION DE PEUPLIERS A GRANDE PROFONDEUR DANS LES DUNES D' DELTA D' PO. [DEEP PLANTING OF POPLARS IN THE DUNES OF THE PO DELTA.] Rev. For. Franc. 12(3): 166-76. 5 refs. [F.]

Mainly a review of Italian reports [cf. May, above] on the plantations of the Nobili-Nichetti estate, using rooted cuttings and planting holes ca. 4 m. deep. Photographs of excavated root systems are included. [Cf. Costin, 1959, P. lasiocarpa to P. nigra and vars., 232.5.]

232.425

Meiden, H. A. van der. 1961. DIE WIRKUNG DER PHOSPHATDÜNGUNG AUF PAPPELPLANZUNGEN. [THE EFFECT OF PHOSPHATE FERTILIZERS ON POPLAR PLANTATIONS.] Phosphorsäure, Essen 21(1/2): 39-50. 2 refs. [G.]

232.43

Prevosto, M. 1963. [A CONTRIBUTION TO THE ECONOMIC STUDY OF SPACING IN POPLAR PLANTATIONS.] Cellulosa e Carta 14(3): 5-20. [It.e.f.g.]

From a study of several plantations of poplar (clone 'I 214'), it was deduced that *m.a.i. of timber* from (a) dense stands (1,252 trees/ha.) on a 6-year rotation, was greater than that from (b) a similar stand on a 10-year rotation, and much greater than that from (c) a widely spaced (357 trees/ha.) one on a 10-year rotation; but the mean financial return of (c) was markedly superior to that of (b), and still more superior to that of (a) (Lire 223, 368, L. 165, 190, and L. 107, 818, respectively).

Rojas y Rojas, J. M., and Rojas Valero, E. 1962. EL CHOPO Y LA TECNICA SELVICOLA CLASICA. [POPLAR AND THE CLASSIC METHOD OF GROWING IT.] Montes, Madrid 18(104): 113-6. [Span.]

232.44

Soules, B. 1960. PHTHINOPORINE HE EARINE PHYTEIA TES EURAMERIKANIKESLEUKES. [AUTUMN OR SPRING PLANTING OF [STUMPS OF] EURAMERICAN POPLAR.] Das Chron. 2(20/21): 885-9. [Gk.] Recent small-scale experiments indicate that autumn planting (November 21) gives more vigorous growth than spring (March 10). Results of 1 year are tabulated.

232.5

Fischer, F. 1960. DIE VERWENDUNG VON SETZSTANGEN BEIM PAPPELANDAU IM APFELSTADT - TAL BEI GÖTHA/THURINGEN. [THE USE OF SETTS IN POPLAR PLANTING IN THE APFELSTADT-VALLEY NEAR GÖTHA, THURINGIA.] Forst u. Jagd 10(3): 107-8. [G.]

233 AFFORESTATION

Knickmann, E. 1959. ZUR NUTZUNG UNFRUCHTBARER BODEN MIT HOHEM GEHALT AN BLEI UND ZINK. [THE USE OF INFERTILE SOILS

WITH HIGH LEAD AND ZINC CONTENTS.] Z. Pflernähr. Dung. 84 (1/3): 255-8. 6 refs. [G.g.e.f.]

The plains north of the Harz Mts. have high contents of Pb and Zn washed down by the rivers. Soils having also a high clay and humus content are suitable for intensive agricultural cropping, but not sandy and gravelly soils. However experimental plantations of hybrid black poplars established on the latter in 1944 have proved successful.

Morgeneyer, W. 1959. DÜNGUNGSVERSUCHE AN PAPPELN UNTER VERWENDUNG EINES BRAUNKOHLE-TORF-GEMISCHES. [FERTILIZER TRIALS ON POPLARS WITH A MIXTURE OF LIGNITE AND PEAT.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 40 (Beitr. Pappelforsch. 111): 81-133. 6 refs. [G.g.russ.e.]

Nelis, E. 1949. BOISEMENT DES PRAIRIES ET DES TERRAINS HUMIDES. [AFFORESTATION OF MEADOWS AND DAMP SITES.] Bull. Soc. For. Belg. 56(7): 287-92. [F.]

Poljakova, A. I. 1962. [A PROMISING SPECIES OF POPLAR.] Priroda, Moskva 51(8): 119. [Russ.]

A brief note on Populus carrieriana, which shows promise for fixing and afforesting moving sands.

234 FORMATION OF FOREST BY NATURAL SUCCESSION

Babos, I. 1955. A NYARFASOK HOMOKBUCKAN ELOFORDULO MEGJELENESI FORMAI [FORMS OF JUNIPER/POPLAR STANDS GROWING ON SAND HILLS.] Erdesz. Kutatas., Budapest 1955(4): 31-86. 22 refs. [Hu.russ.e.g.]

235 UNDERPLANTING, ADVANCE PLANTING, ETC. NURSES AND FORMATION OF MIXTURES

Borsos, Z. 1954. ATMENETI TÁRSULÁSOK A GYERTYANOS-TOLGYESEK TERMOHELYÉN. [TRANSITIONAL ASSOCIATIONS ON HORNBEE/OAK SITES.] Erdo 3(12): 438-45. [Hu.]

235.41

Red'ko, G. I. 1958. VPLYV CORNOJI VIL'HY (ALNUS GLUTINOSA GAERTN.) NA PRODUKTYVNIST' KANADS'KOJI TOPOLI (POPULUS CANADENSIS MNCH.). [EFFECTS OF A. GLUTINOSA ON THE YIELD OF P. X CANADENSIS.] Dopovidi Akademiji Nauk Ukrajins'koji RSR 1958(1): 343-6. 1 ref. [Ukr.russ.e.]

235.5

Szodfridt, I. 1963. [STUDIES OF STAND STRUCTURE IN MIXTURES OF POPULUS X ROBUSTA AND P. X MARILANDICA.] Erdo 12(3): 116-24. [Hu.hu.russ.g.]

235.6

Van, L. 1957. A KISKUNHALASI TERMELOHELYFELTARAS GYAKORLATI HASZNOSITASA. [THE PRACTICAL UTILIZATION OF THE SITE SURVEY IN KISKUNHALAS.] Erdo 6(4): 124-7. [Hu.] From abstr. in Hung. Agric. Rev. 6(4): 7. 1957. [E.] General deep tillage has turned in the grass and weeds for manure, and pit planting of Scots pine and the indigenous Populus canescens among the existing scrub and poplar coppice has been done.

236 CARE OF REGENERATION OR PLANTATIONS IN THE INITIAL STAGES OF ESTABLISHMENT

Peschaut, R. 1947. DIE KULTUR UND PFLEGE DER KANADA- UND ROBUSTAPAPPEL IN DEN DONAUUAEN. [THE CULTIVATION AND TENDING OF "CANADIAN") AND ROBUST.4 POPLARS IN THE DANUBE BOTTOMLANDS.] Allg. Forst-u. Holz. Ztg. 58(17118): 139-41. [G.]

237.4

Gambi, G. 1955. ESSAIS COMPARATIFS D'ENGRAIS, EN SURFACE ET EN PROFONDEUR, EN POPULICULTURE SPECIALISEE. [COMPARATIVE TRIALS OF FERTILIZERS, APPLIED ON THE SURFACE OR IN HOLES, IN SPECIALIZED POPLAR GROWING.] [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/79-E, 6 pp. [F.]

Experiments in the application of a complete N.P.K. fertilizer, to 1-year-old plantations of three different clones of Populus 'canadensis', (1) scattered on the surface, in a radius of 50 cm. from each tree, and (2) put in holes at a depth of 20-30 cm., and 40 cm. distant from the tree at a rate in each case of 2 kg./tree, showed no significant difference between the two methods. Fertilizer treatment produced striking increases in diameter and height growth over controls.

1956. CONSIDERAZIONI SULL'IMPIEGO DI METODI STATISTICI NELL'4 SPERIMENTAZIONE FORESTALE. [THE USE OF STATISTICAL METHOD IN FORESTRY RESEARCH.] *Monti e Boschi* 7 (8): 374-81. [It.f.e.]

After a brief discussion in a general manner, the author illustrates the subject by an account of the use of statistical method in an experimental study of the efficacy of fertilizers, broadcast or dug in, applied to a poplar plantation.

237.41

Liekens, H. 1962. [FERTILIZER TRIALS WITH POPLARS.] *Agricultura*, Louvain 10(4): 791-826. 23 refs. [Du.du.f.e.]

238 TIMBER PLANTATION CROP REQUIRING SPECIAL TREATMENT

Jobling, J. 1955. FARM AND FOREST: 4. CULTIVATION OF POPLARS. *Agriculture* (J. Minist. Agric. Lond.) 62(4): 189-90. Advice on planting sites and suitable soils with special reference to U.K. conditions. Varieties mentioned are *Populuseugenei*, *P. gelrica*, *P. robusta*, *P. serotina*, and *P. serotina erecta*.

Pavsa, J. 1959. REZULTATI PLANTAZNOG UZGOJA TOPOLA U SUMARIJIVARAZDIN 1956.1959 G. [RESULTS OF CROWING POPLARS IN PLANTATIONS IN THE VARAZDIN FOREST DISTRICT, 1956-59.] *Topola*, Beograd 3(10): 811-21. [Serb.f.]

Popnikola, N. 1962. [FIRST RESULTS OF POPLAR PLANTATIONS ON PELAGONIJA AGRICULTURAL ESTATE.] *Topola*, Beograd 6(25/26): 22-6. 3 refs. [Serb.f.]

Describes planting techniques, spacing, intercropping, etc. Of 5 cultivars, the clone I-214 had best height growth after 2 years.

Simon, M. 1963. [ESTABLISHMENT OF POPLAR PLANTATIONS BY DEEP BORING AND DEEP PLANTING IN THE DUNAARTER STATE FOREST.] *Erdo* 12(3): 130-8. [Hu.russ.g.]

242 THINNINGS

Hilf, H. H. 1952. KANN MAN PAPPELBESTANDE DURCHFÖRSTEN? [CAN POPLAR STANDS BE THINNED?] *Holz-Zbl.* 1952(59). 5 pp. [G.g.]

Hybrid black poplars are physiologically ill adapted to make use of extra growing space provided by thinning. Any thinning will involve loss of increment: early thinning involves little loss but will usually not pay; thinning just before crown closure leaves a long period before the crowns can use the extra growing space; and with late thinning they will never fill the space available. Thus unless prices for pulpwood should ever justify the raising of close, unthinned stands, the initial spacing must be wide enough to eliminate the need for thinning.

25 TREATMENT OF DEFECTIVE DERELICT OR VERY OPEN STANDS

Kovacs, Z. N. 1955. ERDSITESI, FASITASI IRANYELVEINK A DUNA TISZA-KOZI HOMOKHATAKON. [DIRECTIVES FOR AFFORESTATION AND

TREE PLANTING ON SANDY RIDGES IN THE REGION BETWEEN THE DANUBE AND TISZA.] *Erdo* 4(3): 103-8. [Hu.]

263 IRRIGATED FORESTS

Kohler, J. 1962. [POPLARS AND TREE WILLOWS IN THE ISAR FLOOD-PLAIN.] *Dtsch. Landwirtsch. Presse*, Hamburg No. 50, 1p. [G.]

Briefly discusses, on the basis of practical experience, soil requirements, diseases and pests, planting methods, etc., and recommends suitable cultivars.

Krembs. 1956. DIE GRAUPAPPEL IN DEN DONAU-AUEN. [POPULUS CANESCENS IN THE FLOOD-PLAINS OF THE DANUBE.] *Allg. Forst-zeitschr.* 11(27/28): 345-7. [G.]

A lecture describing site conditions, particularly near Ingolstadt, where this poplar, which can be grown on sites unsuitable for black poplars, occurs naturally. Its variability suggests its being a post-glacial hybrid of *P. tremula* and *P. alba*. Selection and breeding trials are discussed, including the clone 'Ingol 7,' which can be propagated from cuttings.

265 STRIPS OR LINES AT ROAD, RAIL AND CANAL SIDES, ETC.; HEDGEROW TREES

Grabhorn, R. 1960. BAUMREIHEN ALS HOCHWASSERSCHUTZ. [TREE ROWS AS PROTECTION AGAINST FLOODS.] *Dtsch. Landwirtsch. Presse*, Hamburg and Berlin 1960(8): 76. [G.]

(Suppl. to *Holzzucht*, Reinbek 14(2). 1960)

Mouloupoulos, C., and Tsoumis, G. 1959. AUXETIKAI AKANONISTIAI EUROPA MERIKANIKON HYBRIDION LEUKES KALLIERGOMENON EN MAKEDONIA. [GROWTH ABNORMALITIES IN HYBRID POPLARS CULTIVATED IN MACEDONIA.] *Epistemonike Epeteris*, Geponike kai Dasologike Schole, Aristoteleion Panepistemon Thessalonikes, Thessalonike 5: 197-237. 39 refs. [Gk.gk.e.e.]

266 SHELTERBELTS, WINDBREAKS

Baumann, D. O. 1960. WINDSCHUTZ AM SEEDEICH. [WINDBREAKS ON SEA DYKES.] *Dtsch. Landwirtsch. Presse*, Hamburg 1960(44): 446. [G.]

(Suppl. to *Holzzucht*, Reinbek 14(5/6), 1960.)

Grohn, W. 1955. SCHWARZKIEFERN UND GRAUPAPPELN ALS WINDSCHUTZPFLANZEN. [PINUS NIGRA AND POPULUS CANESCENS FOR WINDBREAKS.] *Holzzucht*, Reinbek 9(3/4): 25-6. [G.]

Reports on the successful establishment and growth of *P. nigra* var. *austriaca* ball-planted at 50-100 cm. high on poor inland sand-dunes near the southwest coast of Schleswig-Holstein, and suggests using this species (preferably with *Syringa vulgaris*) and grey poplars in 'Knicks,' the traditional windbreaks of the region.

3 WORK SCIENCE. HARVESTING OF WOOD: LOGGING AND TRANSPORT. FOREST ENGINEERING

352 PERFORMANCE STUDIES IN FELLING AND RELATED OPERATIONS

Giordano, G. 1954. TEMPIERESA NELL'UTILIZZAZIONE DEL PIOPO. [TIME AND YIELD STUDIES IN EXPLOITATION OF POPLAR.] *Cellulosa e Carta* 5(9): 7-15. [It.f.e.]

A study of working times and yield, by assortments, in the exploitation of a 9-year-old stand of hybrid poplar (I214).

1957[1959]. ETUDE SUR LES TEMPS DE TRAVAIL ET LES PRODUITS OBTENUS DANS L'EXPLOITATION D'UNE PEUPLERAIE DE POPULUS EUROAMERICANA CL. 1-214. [TIME AND YIELD STUDY IN EXPLOITATION OF A STAND OF P. 'CANADENSIS' CL. 1-214.] *Proc.*, 4th World For. Congr. Dehra Dun 1954, Vol. 2: 511-6. [F.]

4 FOREST INJURIES AND PROTECTION

Goidanich, G., Vivani, W., and Mezzetti, A. 1947. LA "LEBBRA" DEL PIOPO. [POPLAR "LEPROSY."] *Ital. For. Mont.* 2(3): 149-55. [It.]

Magyar, P. 1938. THE QUESTION OF CANADIAN POPLAR. *Erdesz. Lap.* 77(5): 432-45. [Hu.g.f.e.]

Control of red heart.

414.4

Chardenon, J., and Taris, B. 1956. EFFECT PHYTOXIQUE DE QUELQUES FONGICIDES VIS-A-VIS DES COULTURES DE PEUPLIERS. [TOXIC EFFECTS OF SOME FUNGICIDES ON POPLAR CUTTINGS.] C.R. Acad. Agric. France 42(14):709-13. [F.]

416.1

Johannes, H. 1950151. SEPTOGLOEUM POPULIPERDUM SP. N. ALS ERREGER EINES PAPPELSTERBENS. [S. POPULIPERDUM, CAUSE OF A LETHAL DISEASE OF POPLAR.] Phytopathologische Zeitschrift, Berlin 17(4):406-10. 4 refs. [G.]

S. populiperdum has been found in Germany on Populus verni-rubens, P. bachelierii, P. generosa, and P. robusta.

1951. EIN PAPPELSTERBEN IN NIEDERSACHSEN. [A LETHAL DISEASE OF POPLAR IN LOWER SAXONY.] Mitt. Biol. Zent.-Anst., Berlin No. 70: 45-6. [G.]

416.5

Pecrot, A. 1955. DIFFERENTES RELATIONS ENTRE L'APPARITION DE LA GELIVURE CHEZ LE PEUPLIER EURAMERICAIN ET LES PRINCIPAUX CARACTERES MORPHOLOGIQUES DU SOL EN BELGIQUE. [RELATIONS BETWEEN THE OCCURRENCE OF FROST-CRACK IN HYBRID "CANADIAN" POPLARS AND THE PRINCIPAL PHYSICAL CHARACTERS OF THE SOIL.] Spec. Pap. 8th Sess. Int. Poplar Comm., Madrid 1954 No. FAO/CIP/75-D Add. 1: 67-83. [F.]

422.1

Donaubauer, E. 1963. MELAMPSORA ALLII-POPULINA. [FROST INJURIES AND MELAMPSORA INFECTION ON VARIOUS POPLAR CULTIVARS.] Allg. Forstztg. 74 (1/2): Suppl. (Informationsdienst No. 64). 2 pp. 3 refs. [G.]

Poskin, A., and Flon, P. 1955. CONTRIBUTION A L'ETUDE DE LA GELIVURE DES PEUPLIERS EURAMERICAINS EN BELGIQUE. [FROST-CRACK OF "CANADIAN" POPLARS IN BELGIUM.] Spec. Rep. 8th Sess. Int. Poplar Comm., Madrid 1954 No. FAO/CIP/75-D Add. 1: 3-51. 23 refs. [F.f.]

422.12

Petrescu, L. 1958. VATAMARICAUZATE DE GER IN ARBORETELE DE PLOPI NEGRI HIBRIZI. [FROST INJURY IN PLANTATIONS OF HYBRID BLACK POPLARS.] Rev. Padurilor 1958(4): 214-5. 3 refs. [Rum.] Describes injuries caused by the severe frost of 1952 (down to -18° C. in March) in 19-year-old plantations of Populus x euramericana on deep alluvial soils at 80 m. alt. Ca. 30 percent of the trees displayed frost cracks-17 percent typical and 13 percent superficial.

44 DAMAGE BY HARMFUL PLANTS. VIRUS DISEASES

Bongini, V. 1949. TUMORI DELLA ROBINIA E DEL PIOppo. [TUMORS OF ROBINIA AND POPLAR.] Ann. Sper. Agr. (n.s.) 3(1): 16-7. [It.]

Ferraris, T. 1936. SPRING WILT OF THE SHOOTs OF CANADIAN POPLAR. Riv. Agric., Roma 32 (736): 223. Rev. Appl. Mycol. 16(1): 5. 1937.

443 FUNGI AND BACTERIA

Anonymous. 1932. DISEASES AND INSECT PESTS OF ELM AND P. CANADENSIS. For. Rundschau 5: 41.

443.2

Muller, R. 1953. ZUR FRAGE DES PAPPELRINDENTODS. [POPLAR BARK DISEASE (D. POPULEA).] Schweiz. Z. Forstw. 104(9): 408.28. 8 refs. [G.g.f.]

1955. WEITERE ERFAHRUNGEN UBER DEN PAPPELRINDENTODS (DOTHICHIZA POPULEA). [FURTHER RESEARCH ON POPLAR BARK DISEASE (D. POPULEA).] Schweiz. Z. Forstw. 104(10): 534-5. Further experiments in the artificial inoculation of poplar seedlings showed that D. populea is unable to infect even sickly plants during the growing season. Infection takes place only when the plants are dormant and the temperature is favorable to fungal development (above 0° C.).

Poleac, E. 1961. "SCARE.4 PUIETILOR DE PLOPI NEGRI HIBRIZI PRODUSA DE CIUPERCILE DOTHICHIZA POPULEA SI CYTOSPORA CHRYSO-

SPERMA SI COMBATEREA EI. [CANKER OF YOUNG PLANTS OF HYBRID BLACK POPLARS CAUSED BY D. POPULEA AND C. CHRYSOSPERMA, AND ITS CONTROL.] Rev. Padurilor 76(11):670-3. 8 refs. [Rum.russ.g.f.e.]

443.3

Acatay, A. 1961. [NOTES ON HEARTWOOD DECAY IN POPLAR.] Istanbul Univ. Orm. Fak. Derg. 11B(1): 43-8. 6 refs. [Turk.] 81 sample trees of P. canadensis in three plantations in different districts were cross-cut in 2-m. lengths to ascertain the extent of incipient decay as judged by discoloration; 74 were affected despite growths of 2 to 5 m. in height and 2-5 cm. diam. a year. The decay is ascribed to too high a water table, damage to roots by tractor ploughing, other wounds and insect damage (Saperda carcharias, Trochilium apiforma, Melanophila decastigma) providing ports for decay.

Dahte, A. 1960. VORBEUGUNG GEGEN DOTHICHIZA - BEFALL DER BAUMSCHULPFLANZEN DURCH CHEMIKALIENSPRITZUNG. [PREVENTING DOTHICHIZA ATTACK ON NURSERY PLANTS BY CHEMICAL SPRAYS.] Holz-Zbl. 86(67): 934. [G.]

Donaubauer, E. 1957. UBER EINE BLATT- UND ZWEIGKRANKHEIT DER KANADAPPEL. [A LEAF AND SHOOT DISEASE OF HYBRID BLACK POPLARS.] Allg. Forstztg. 68 (23/24): 341. 6 refs. [G.] Describes the disease caused by Venturia populina and its conical form Pollacciaelegans, its occurrence in Austria, and possibilities of control. Bordeaux mixture has been tried with varying success.

Fassi, B. 1955. RICERCHES SUL MARCIUME RADICALE DEL PIOppo IN PIEMONTE. [ROOT ROTS OF POPLAR IN PIEDMONT.] In Studie Ricerche Sulla Pioppicoltura, Ente Nazionale per la Cellulosae per la Carta, Rome, pp. 43-96. [It.] Describes damage caused by, and morphology and life history of, Rosellinia necatrix, Pholiota aegerita, Armillaria mellea, and Vialina radicecola on "Canadian" poplars.

Georgescu, C. C., and Clonaru, A. 1959. APARITIA CANCERULUI BACTERIAN AL PLOPULUI IN R.P.R. [THE OCCURRENCE OF BACTERIAL CANCER IN HYBRID BLACK POPLARS IN RUMANIA.] Rev. Padurilor 74(3): 169-71. 8 refs. [Rum.russ.g.f.e.]

Kispatic, J. 1957. O PROBLEMU UZGOJA TOPOLA SA FITOPATOLOGSKOG GLEDISTA. [POPLAR CULTIVATION FROM A PHYTOPATHOLOGICAL VIEWPOINT.] Topola, Beograd 1(2):109-24. 9 refs. [Serb.f.] Discusses recent poor results in the cultivation of hybrid black poplars in Yugoslavia, largely as a result of infection by Douthichiza populea. Aspects considered are poplar site requirements, the location of nurseries, seedling quality, and poplar degeneration. The planting of willow is suggested on very moist sites unsuitable for poplar. Some data are also given on the biology of D. populea. [Cf. F.A. 19, No. 3173.1]

Knezevic, I. 1959. POKUSAJ MEHANICKOG SUZBIJANJA DOTHICHIZA POPULEA NA EURAMERICKIM TOPOLAMA. [AN ATTEMPT AT MECHANICAL CONTROL OF D. POPULEA ON HYBRID BLACK POPLARS.] Sum. List 83(10/11): 370-1. [Croat.]

Lange, A. de, and Kerling, L. C. P. 1962. APLANOBACTERIUM POPULI, THE CAUSE OF BACTERIAL CANCER OF POPLAR. Tijdschr. PlZiekt. 68(5): 289-91. 4 refs. [E.e.d.u.] A bacterium isolated from cankers of Populus candicans was identical with A. populi [cf. F.A. 20, No. 734]. Cuttings of P. candicans inoculated with bacteria through freshly made leaf scars showed typical symptoms of the disease.

Magnani, G. 1963. [TESTS OF THE RESISTANCE OF SOME EURAMERICAN POPLARS TO DOTHICHIZA POPULEA.] Pubbl. Cent. Sper. Agric. For., Roma 6: 155-78. 10 refs. [It.ite.e.] Inoculation tests made on four hybrid clones and on Populus alba confirmed that the best protection against the disease in Central Italy is provided by the use of vigorous planting stock, care in planting and irrigation. 'I 154' proved to be moderately resistant, 'I 214' and 'I 455' moderately susceptible, 'I 262' appreciably and P. alba highly susceptible.

Meiden, H. A. van der, and Vloten, H. van. 1958. ROEST EN SCHORSBRAND ALS BEDREIGING "AN DE TEELT "AN POPULIER. [RUST AND BARK NECROSIS AS THREATS TO POPLAR GROWING.] Ned. Boschb.-Tijdschr. 30(9/10): 261-73; 289. [Du.e.g.] (Korte Meded. Bosbouwproefsta., Wageningen Mo. 37.)

Milatovic, I. 1963. [SPRING DEFOLIATION OF POPLARS DUE TO POLLACCIA ELEGANS.] Sum. List 87(5/6):187-90. 12 refs. [Serb.e.] Describes damage in spring 1963 on *Populus x canadensis* in Yugoslavia, illustrating symptoms.

Moriondo, F. 1954. OSSERVAZIONI SUL CICLO BIOLOGICO DE LLA MELAMPORA SP. DEL PIOPO IN ITALIA. [OBSERVATION ON THE BIOLOGICAL CYCLE OF A MELAMPORA SP. ON POPLAR IN ITALY.] Ital. For. Mont. 9(5): 259-64. 16 refs. [It.it.f.]

Peno, M. 1961. PATOLOSKO ODUMIRANJE KORE TOPOLA I VRBA. [PATHOLOGICAL BARK NECROSIS IN POPLAR AND WILLOW.] Topola, Beograd 5(19):9-10. 1 ref. [Serb.f.]

Gives a more detailed description, following investigations of a bark necrosis, shown to be of bacterial origin, noted on 'Canadian' poplars (*P. x marilandica*, *P. x robusta*, clone I-154) and *Salix alba*. The disease develops only on very wet sites, and is favored by close spacing; these should be avoided when planting susceptible species.

Vivani, W. 1959. NOTE SULLA 'BATTERIOSI DEL PIOPO'. [NOTES ON 'BACTERIAL' DISEASE OF POPLAR.] Cellulosa e Carta 10(2): 3-15. 8 refs. [It.f.e.g.]

Vlasov, A. A., Krangauz, R. A., and Ljajman, E. E. 1960. PARAZITIZM VOZBUDITELEJ NEGNILEVYH ZABOLEVANIJ STVOLOV DUBA, JASENJA I TOPOLJA. [PARASITISM OF PATHOGENS CAUSING STEM NECROSES AND CANKERS IN OAK, ASH, AND POPLAR.] Sborn. Rabot Lesn. Hoz. Vsesojuz. Nauc.-Issled. Inst. Lesovod. No. 40: 185-205. [Russ.]

Vujic, P. 1962. [THE SUSCEPTIBILITY OF SOME HYBRID BLACK POPLARS TO DOTHICHIZA POPULEA.] Topola, Beograd 6(28):77-80. 9 refs. [Serb.serb.f.]

In similar conditions of exposure to infection, it was found that the clones 'I-154' and 'I-214' were thrice as resistant to *D. populea* infection as the clone 'Jacometti' and *Populus x robusta*, and when infected, their area of necrosed tissue was only one-tenth of the latter two.

444 VIRUS DISEASES

Corte, A. 1960. IL 'MOSAICO' DEL PIOPO. [POPLAR MOSAIC DISEASE.] Monti e Boschi 11(3): 127-30. [It.f.e.]

Perisic, M. 1951. NOVA VIRUSNA BOLEST NA KANADSKOJ TOPOLI KOD NAS. [A NEW VIRUS DISEASE OF "CANADIAN" POPLAR IN YUGOSLAVIA.] Sumarstvo 4(5): 313. 1 ref. [Serb.f.]

451.2

Magnani, G. 1959. DANNI PRODOTTI DA RODITORI SU PIOPO E ONTANO. STUDIO SULLE CICATRIZZAZIONE E SUI TESSUTI CICATRIZIALI. [DAMAGE BY RODENTS ON POPLAR AND ALDER. STUDY OF CALLUS FORMATION AND CALLUS TISSUES.] Pubbl. Cent. Sper. Agric. For., Roma 2: 119-35. 3 refs. [It.it.e.e.]

Milovanovic, M. 1956. STETE OD VODENE VOLUHARICE U MLADIM TOPOLOVIM KULTURAMA I MERE ODBRANE. [INJURIES TO YOUNG POPLAR PLANTATIONS BY ARVICOLA TERRESTRIS AND MEASURES OF CONTROL.] Sumarstvo 9(6/7):390-3. 1 ref. [Serb.]

Petrovic, N., and Vasic, M. 1958. MASOVNA POJAVA POLJSKE VOLUHARICE I NJENO SUZBIJANJE U LOVNO-SUMSKOM GOSPODARSTVU "KOSUTNJAK." [OUTBREAK AND CONTROL OF MICROTUS ARVALIS AT KOSUTNJAK [SERBIA].] Sumarstvo 11 (9/12): 663-5. [Serb.] *M. arvalis*, causing severe damage to roots of *Populus serotina*, *P. robusta*, and *P. marilandica* as well as to other species in nurseries and young plantations, was controlled by bait containing Zn_3P_2 .

453 INSECTS

Androic, M. 1950. TOPOLIN GUBAR (STILPNOTIA SALICIS L.). [THE SAT IN MOTH (LEUCOMA SALICIS).] Sum. List 74(12):484-7. [Croat.]

Erdem, R. 1951. TURKIYEDE YENI BIR KAVAK KULTUR TAHRIPCISI CRYPTORRHYNCHUS LAPATHI L. [C. LAPATHI AS A NEW PEST OF POPLAR [POPULUS 'CANADENSIS'] STANDS IN TURKEY.] Istanbul Univ. Orm. Fak. Derg. 1A(2): 111-4. [Turk.g.]

Moore, G. 1958. OBSERVACIONES SOBRE ATAQUES DEL ESCARABAJO NEGRO DEL TRIGO (DYSCINETUS GAGATES) EN PLANTACIONES FORE-

STALES. [ATTACK OF THE BLACK WHEAT BEETLE, D. GAGATES, IN FOREST PLANTATIONS.] Rev. For. Argent. 2(3): 90-2.1 ref. [Span.]

Pasek, V. 1954. PTEROCOMMA TREMULAE CB. 1940, NOVY SKODCA KANADSKOHO TOPOL'A. [P. TREMULAE, A NEW PEST OF "CANADIAN" POPLAR.] Prace Vyzkum. Ust. Lesn. CSR No. 5: 151-61. 5 refs. [Slovak.russ.g.]

Describes the gradation of this pest on *Populus canadensis* Moench = *P. deltoides Marsch [sic]* near Banska Stiavnica in Slovakia during 1951-53.

Qairi, M. A. H. 1951. A PRELIMINARY STUDY OF THE POPLAR LEAF BEETLE—NODOSTOMA SP. Pakistan J. For. 1(2): 119-21.

Life history, damage, etc. of the most important pest of *Populus ciliata* and *P. nigra* on the Murroe hills. It has not yet been identified and is possibly a new species.

Soules, B. 1960. PROSBOLAI EURAMERIKANIKES LAUKES HYPO HEMIPTERON. [HEMIPTERA ATTACKING EURAMERICAN POPLARS.] Das. Chron. 2(26): 1164. [Gk.]

A note on *Phloeomyzus passerinii* and *Lepidosaphes ulmi*, both found on poplar near Drama, Macedonia (the former brought on stock imported from Italy) where local damage has resulted; with brief notes on control.

Vujic, P. 1960. O POJAVI TOPOLINOG GUBARA (STILPNOTIA SALICIS L.). [AN OCCURRENCE OF S. SALICIS.] Topola, Beograd No. 16: 20-2. 3 refs. [Serb.f.]

48 INJURIES DUE TO UNKNOWN OR COMPLEX CAUSES

Plavsic-Kirjakovic, V. 1962. [PHYTOPATHOLOGICAL PHENOMENA ON CLONE I-154.] Topola, Beograd 6(29/30):40-2. 4 refs. [Serb.f.]

524 DETERMINATION OF THE VOLUME OF TREES AND STANDS

Petrescu, L. 1955. FORMA SI VOLUMUL PLOPILOR NEGRI HIBRIZI. [FORM AND VOLUME OF HYBRID BLACK POPLARS.] Rev. Padurilor 70(10): 443-8. 9 refs. [Rum.russ.]

On the basis of measurements of 1,283 trees of *Populus regenerata*, *P. marilandica*, and *P. serotina*, the author constructs a volume table and a table of form factors, and compares these with Rumanian figures for *P. alba* and *P. tremula*.

Ratzel, K. 1955. UNTERSUCHUNGEN UBER INHALT UND FORM, SOWIE DIE BEZIEHUNG ZWISCHEN KRONE UND ZUWACHS BEI DER PAPPEL. [VOLUME AND FORM OF POPLARS, AND THE RELATION BETWEEN SIZE OF CROWN AND INCREMENT.] SchrReihe Bad. Forstl. VersAnst. No. 10, 84 pp. 33 refs. [G.g.]

524.12

Csiszar, I. 1955. FATOMEGTÁBLAK SZERKESZTESE. [[A STEP TOWARDS THE] CONSTRUCTION OF POPLAR VOLUME TABLES.] Erdesz. Kutatas., Budapest 1955(4): 15-29. 8 refs. [Hu.russ.e.g.]

524.13

Petrescu, L. 1956. CONTRIBUTII LA STUDIUL FORMEI PLOPILOR NEGRI HIBRIZI. [CONTRIBUTION TO THE STUDY OF THE FORM OF HYBRID BLACK POPLARS.] Rev. Padurilor 71(6): 382-3. [Rum.] In pursuance of his studies on the form of "Canadian" poplar, the author presents a table of form quotients.

541 BASED ON HEIGHT, DIAMETER, VOLUME, ETC.

Dabrowski, T., and Sikora, B. 1955. PROBA OKRESLENIA WYDAJNOSCI SIEDLISK TOPOLOWYCH W OPARCIU O BONITOWANIE ISTNIACYCH DRZEWOSTANOW TOPOLOWYCH. [TENTATIVE DETERMINATION OF THE PRODUCTIVITY OF POPLAR SITES, BASED ON THE SITE-CLASS GRADING OF EXISTING POPLAR STANDS.] Roczn. Nauk. Lesn. No. 13: 29-44. 3 refs. [Pol.pol.russ.e.] (Prace Inst. Bad. Lesn. No. 145.)

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Anonymous. 1927. GROWTH FIGURES FOR CANADIAN POPLAR. Silva 15: 46.

Avanzo, E. 1963. [TREE MEASUREMENTS IN A POPLAR PLANTATION AT CASTELPORZIANO.] Pubbl. Cent. Sper. Agric. For., Roma 6: 251-8. 4 refs. [It.it.e.e.]

Measurements were made on a plantation of *Populus x eurameri-*

cana, on a sandy soil with high water table, clear felled at 14 years. Initial density had been 433/ha., final density was 389/ha. The stand had never been thinned or pruned and approximated to natural forest. Mean height was 24.2 m., mean b.a. 714 sq. cm., and form factor 0.4.

Georgieff [Georgiev], J. 1959. DIE EUROAMERIKANISCHE PAPPEL, DIE LEISTUNGSFAHIGSTE HOLZART IN DER VOLKSREPUBLIK BULGARIEN. [POPULUS X CANADENSIS, THE TREE WITH THE HIGHEST YIELD IN BULGARIA.] Forst u. Jagd 9(2): 55-7. 6 refs. [G.]

Contains data, from the author's local yield table, on height and diameter growth, and the effect of spacing on diameter, increment, and yield.

Gross. 1932. NEW INFORMATION ON GROWTH ETC. OF P. CANADENSIS. Dtsch. Forstztg. 47: 665.

Petrescu, L., and Disescu, R. 1955. STUDIU PRELIMINAR ASUPRA PRODUCTIEI SI PRODUCTIVITATII ARBORETELOR DE PLOPI NEGRI HIBRIZI. [PRELIMINARY STUDIES ON THE YIELD AND PRODUCTIVITY OF HYBRID SLACK POPLAR STANDS.] Rev. Padurilor 70(7): 315-20. 7 refs. [Rum.]

Gives tabulated data, by age classes (3-32) for poplar (*P. regenerata*, *P. robusta*, *P. marilandica*, and *P. serotina*) stands in the flood-plain of the lower Danube. Data include mean d.b.h., mean height, number of trees/ha., volume/ha., and m.a.i. in cu.m./ha. as well as minimum and maximum d.b.h., all derived from 56 sample plots.

561 INCREMENT IN HEIGHT, DIAMETER, BASAL AREA, FORM AND QUALITY

Patrone, G. 1950. RICERCHE DENDROMETRICHE SUL PIOPOPO DEL CANADA CRESCIUTO A FILARI. [A MENSURATIONAL STUDY OF "CANADIAN" POPLAR GROWN IN ROWS.] Ital. For. Mont. 5(3): 121. [It.]

566 YIELD TABLES AND THEIR CONSTRUCTION

Crocoll, A. 1957. DER MASSENERTRAG VON PAPPELBESTANDEN IN DER NORDBADISCHEN RHEINEBENE. [THE YIELD OF POPLAR STANDS IN THE RHINE PLAIN IN N. BADEN.] Forstwiss. Forsch. No. 8, 36 pp. 2 refs. [G.]

Rohmeder, E. 1943. WUCHSLEISTUNGEN MANNLICHER UND WEIBLICHER KANADISCHER PAPPELN IM GRAFLICH "ON PREYSINGSCHE FORSTBEZIRK MOOS. [YIELD OF MALE AND FEMALE CANADIAN POPLARS IN THE GRAFLICH VON PREYSINGSCHE FOREST DISTRICT MOOS.] Forstwiss. Cbl. u. Thar. Forstl. Jb. No. 6: 225-33. Bblg. [G.g.]

Schmitz-Lenders, B. 1948. PAPPEL-ERTRAGSTAFELN, MIT EINER PAPPEL-MASSENTAFEL IM ANHANG. [YIELD TABLES FOR POPLAR (POPULUS REGENERATA), TO WHICH IS APPENDED A VOLUME TABLE.] M. & H. Schaper, Hannover-Waldhaus. 29 pp. [G.] Includes volume and money yield tables for single trees, forest stands (7x 7, 10x10 m., spacing) and stands on meadowland (20x20 m. spacing).

Walther. 1895. GROWTH AND YIELD OF CANADIAN POPLAR IN HESSEN, GERMANY. Allg. Forst- u. Jagdztg. 71: 343-5.

8 FOREST PRODUCTS AND THEIR UTILIZATION

Paraschiv, E., and Marinescu, D. 1962. UTILIZAREA LEMNULUI DE PLOPI NEGRI HIBRIZI IN INDUSTRIA DE PLACAJE SI PANELE. [THE USE OF THE WOOD OF HYBRID BLACK POPLARS IN THE PLYWOOD AND FIBREBOARD INDUSTRIES.] Industr. Lemn. 13(3): 86-90. 10 refs. [Rum.russ.g.f.e.]

Experiments with Rumanian plantation-grown *Populus x regenerata* (2 types) and *P. x marilandica* indicated that the "Celei" type of *P. x regenerata* (with straight cylindrical stems and thin bark) is suitable for both purposes.

81 WOOD AND BARK: STRUCTURE AND PROPERTIES

Lenz, O. 1954. LE BOIS DE QUELQUES PEUPLIERS DE CULTURE EN SUISSE. [THE WOOD OF SOME POPLARS GROWN IN SWITZERLAND.] Mitt. Schweiz. Anst. Forstl. Versuchsw. 30: 1-61. 86 refs. [F.f.g.]

Piccarolo, G. 1958. PROVE TECNOLOGICHE PER ALCUNI CLONI DI PIOPOPO. [TECHNOLOGICAL TESTS ON SOME POPLAR CLONES.] Cellulosa e Carta 9(11; 12): 9-22; 15-27. [It.f.e.g.]

The test data include lignin chemistry, wood anatomy (with photomicrographs), stem form, bark percent, physical and mechanical properties, working properties, and pulping properties, and the clones dealt with are *Populus x euramericana* (Dode) Guinier 1-37, 1-154, 1-214, 1-455, 1-476, and 1-488, and *P. x euramericana* "f. monilifera."

810 GENERAL INFORMATION ON WOODS

Hartig. 1893. THE GROWTH AND WOOD OF THE CANADIAN POPLAR. Forstl. Naturw. Z. 2: 89-93.

Pallay, N. 1938. INFORMATORY RESEARCH ON THE TECHNICAL QUALITIES OF POPULUS CANADENSIS AND P. ROBUSTA. Erdesz. Lap. 77(10): 850-61. [Hu.g.f.e.]

———. 1938. RESEARCH ON THE TECHNICAL QUALITIES OF POPULUS CANADENSIS AND P. ROBUSTA (CONCLD.). Erdesz. Lap. 77(11): 962-974.

811 STRUCTURE. IDENTIFICATION

Walek-Czernecka, A. 1952. ANATOMIA POROWNAWCZA DREWNA POPULUS ALBA L., POPULUS TREMULA L., POPULUS CANESCENS SM. [COMPARATIVE WOOD ANATOMY OF P. ALBA, P. TREMULA, AND P. CANESCENS.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 8: 1-31. 21 refs. [Pol.russ.f.]

811.14/16

Scaramuzzi, G. 1956. VARIATION OF THE VOLUME PROPORTIONS OF WOOD ELEMENTS WITHIN THE STEM IN POPULUS X EURAMERICANA (DODE) GUINIER cv. "1-214." [Docum.] 12th Congr. Int. Union For. Res. Organ., Oxford 1956 No. IUFRO 5614115 Rev. 7 pp. [E.e.]

Investigation on a 10-year-old tree showed little variation in the volume percent of fibres, vessels and rays, within the growth ring either radially or longitudinally or radially across the stem. [Cf. Scaramuzzi, 1955, *P. canadensis* to *P. davidiana*, 811.156.]

81 1.155

Messeri, A. 1954. CARATTERI DIMENSIONALI E STRUTTURALI DELLE FIBRE DI TENSIONE DI UN CAMPIONE DI PIOPOPO (POPULUS EURAMERICANA GUINIER, cv. CLONE 214). [DIMENSIONS AND STRUCTURES OF FIBRES IN TENSION WOOD FROM A SAMPLE OF P. "EURAMERICANA" CLONE 214.1 Cellulosa e Carta 5(8): 8-10. 6 refs. [It.]

81 1.156

Scaramuzzi, G. 1955. DIMENSIONAL DATA ABOUT FIBERS IN POPULUS X EURAMERICANA (DODE) GUINIER cv. "1-214." [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/79-C, 20 pp. [E.]

81 1.22

Vandeveld, R. 1957. BIJDRAGE TOT DE STUDIE VAN REACTIEHOUT. [CONTRIBUTION TO THE STUDY OF REACTION WOOD.] Meded. Lab. Houttechnol., Gent No. 14, 18 pp. 41 refs. [Du.f.e.g.]

812 PHYSICAL AND MECHANICAL PROPERTIES

Curro, P. 1959(1960). INDAGINI TECNOLOGICHE SUL LEGNO DI ALCUNI IBRIDI EURAMERICANI DI PIOPOPO. I. CARATTERISTICHE FISICHE E MECCANICHE. [TECHNOLOGICAL INVESTIGATIONS ON THE WOOD OF SOME HYBRID POPLARS [POPULUS X "CANADENSIS"]. I. PHYSICAL AND MECHANICAL CHARACTERS.] Pubbl. Cent. Sper. Agric. For., Roma No. 3: 3-59. 7 refs. [It.it.e.e.]

812.21

Curro, P. 1955. VARIATIONS IN MOISTURE CONTENT, BASIC DENSITY AND OVEN DRY DENSITY IN POPULUS X EURAMERICANA (DODE) GUINIER cv. "1-214." [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/79-D, 5 pp. [E.]

1957. PHYSICAL CHARACTERISTICS OF THE WOOD OF *POPULUS* × *EURAMERICANA* (DODE) GUINIER'I 154' AND OF *POPULUS TREMULA* L. [Docum.] Int. Poplar Comm., 5th Sess. Wkg. Party on Exploitation and Utilization, Paris 1957 No. FAO/CIP/UT-2, 12 pp. 2 refs. [E.]

812.31

Gohre, K. 1960. DIE VERTEILUNG VON ROHWICHTEN IM PAPPELSTAMM. [THE DISTRIBUTION OF DENSITY IN POPLAR STEMS.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 44 (Beitr. Pappelforsch. No. 4): 51-79. 13 refs. [G.g.russ.e.]

812.7

Hirai, S., Tsuchiya, K., and Aida, T. 1962. [MECHANICAL PROPERTIES OF THE WOODS OF *POPULUS* SPP. OF THE TOKYO UNIVERSITY FOR EST IN HOKKAIDO.] Misc. Inform. Tokyo Univ. For. No. 14: 63-71. 16 refs. [Jap.]

Presents tabulated results of standard tests on *P. tremulavar. davidiana* (separately for green-, orange-, and grey-barked forms) and *P. maximowiczii*, from trees 28-40 years old; also for 22 Japanese, Manchurian, or Korean provenances of *P. maximowiczii*.

812.74

Giordano, G., and Curro, P. 1959. LA VARIATION DE LA RESISTANCE AU CISAILLEMENT EN FONCTION DE LA TEMPERATURE. [THE EFFECT OF TEMPERATURE ON SHEAR STRENGTH [OF POPLAR WOOD].] [Docum.] Int. Poplar Comm. 6th Sess. Wkg. Party on Exploitation and Utilization, Rome 1959 No. FAO/CIP/UT-9B, 5 pp. [F.]

813 WOOD CHEMISTRY

Martinez Mata, F. 1960. [FORESTRY GROUP: SECTION FOR FOREST GENETICS.] An. Inst. For. Invest. Exp., Madrid 32(5): 71-7. [Span.]

813.1.1

Desmet, J. 1960. MISE EN EVIDENCE DE L'HETEROGENEITE D'UNE LIGNINE NATIVE DE *POPULUS CANESCENS* SM. [HETEROGENEITY OF A NATIVE LIGNIN OF *P. CANESCENS*.] C.R. Acad. Sci., Paris 250(20): 3374-6. 7 refs. [F.f.]

A study of four fractions obtained from the native lignin indicated that it is not a homogeneous substance.

1960. SEPARATION PAR ELECTROPHORESE DES CONSTITUANTS D'UNE LIGNINE NATIVE DE *POPULUS CANESCENS*. [ELECTROPHORETIC SEPARATION OF THE CONSTITUENTS OF A NATIVE LIGNIN OF *P. CANESCENS*.] C. R. Acad. Sci., Paris 251(5): 780-2. 3 refs. [F.f.]

Fourteen fluorescent constituents were obtained, some naturally colored, and also a nonfluorescent, colorless substance giving a positive reaction with phloroglucin/HCl. None of the fractions obtained in the previous study is a pure substance.

Robert, A., and Desmet, J. 1960. ETUDE SPECTROGRAPHIQUE DANS L'INFRAROUGE D'UNE LIGNINE NATIVE DE *POPULUS CANESCENS* SM. [AN INFRARED SPECTROGRAPHIC STUDY OF A NATIVE LIGNIN OF *P. CANESCENS*.] C.R. Acad. Sci., Paris 251(3): 430-2. 2 refs. [F.f.] The study showed similar but not identical curves for the native lignin and four fractions from it. It is concluded that the native lignin is a mixture of substances very closely related chemically.

832.15

Senyszyn, P. 1962. [YIELD OF SAWN TIMBER FROM POPLAR THINNINGS.] Silvicultura, Uruguay No. 18: 38-47. [Span.e.f.]

Presents the results of a mill study to estimate yield of sawn timber from small-size *Populus* × 'canadensis' cv. 1-154 (diam. 9-17.8 cm.). Yield was <50%, but costs were low enough to justify the utilization of thinnings of this kind, given reasonably straight stems.

832.2

Istrate, V. 1963. [MANUFACTURING VENEER FROM THE WOOD OF "EURAMERICAN" POPLARS.] Industr. Lemn. 14(5): 165-75. [Rum. russ.g.f.e.]

Gives the results of experiments in rotary cutting of veneer from Rumanian-grown *Populus* × *marilandica* and *P.* × *robusta*, and discusses the effects of log storage, peeling parameters, and drying of veneers.

847.1

Curro, P. 1962. [SEASONING POPLAR BOARDS.] Cellulosa e Carta 13(11): 21-3. [It.f.e.g.]

Gives tabulated and graphic data showing the changes in m.c. in *Populus* × *euramericana* cv. 'I-455' boards 35 mm. thick, stacked (3 × 3 m.) in the open with stickers and a roof, over a period of 44 weeks at Casale Monferrato. M.c. fell from ca. 191% in November to 23% in the following September.

861 PULP AND PAPER MANUFACTURE. TEXTILE AND OTHER CELLULOSE DERIVATIVES

Brecht, W. 1953. DIE HERSTELLUNG "ON WEISSSCHLIFF AUS PAPPELHOLZ IM SCHLEIFEREI-LABORATORIUM. [MANUFACTURE OF WHITE GROUNDWOOD FROM POPLAR IN A GROUNDWOOD LABORATORY.] Holz Roh- u. Werkstoff 11(8): 293-6. 4 refs. [G.g.]

9 FORESTS AND FORESTRY FROM THE NATIONAL AND INTERNATIONAL POINTS OF VIEW

907.3

Pavari, A., and Gasparini, M. 1943. L'ASIONE DI DIFESA DEI FRANGIVENTI SULLA COLTURA GRANARIA. [THE PROTECTIVE EFFECT OF WINDBREAKS ON CEREAL CULTIVATION.] Mariano Ricci, Via S. Galle 30, Florence. 34 pp. [It.]

91 LAND USE, LAND-USE POLICY, AFFORESTATION POLICY

Moretti, A. 1950. I TERRENI Golenali: NUOVI ORIENTAMENTI PER LA LORO UTILIZZAZIONE. [THE MUD BANKS [OF THE R. PO AND ITS CONFLUENTS]: NEW IDEAS FOR THEIR UTILIZATION.] Ital. Agric. 87(9): 563-8. 6 refs. [It.] [Cf. Bernardini, 1948, *P. canadensis* to *P. davidiana*, 2.]

P. DELTOIDES TO P. GENEROSA

0 GENERAL

Applequist, M. B. 1959. A SELECTED BIBLIOGRAPHY ON COTTONWOOD (*POPULUS DELTOIDES*). LSU For. Notes La. Agric. Exp. Sta. No. 24, 3 pp. 35 refs. U.S. literature, chiefly from 1940.

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

151 MODE OF LIFE, AUTECOLOGY, HABITS, ADAPTABILITY

Steyskal, G. C. 1949(1951). THE DIPTEROUS FAUNA OF TREE TRUNKS. Pap. Mich. Acad. Sci. 35: 121-34. 33 refs. Notes on *Diptera* gathered on or under the bark of trunks of *Populus deltoides* and *Robinia pseudoacacia*.

1952(1953). FURTHER NOTES ON DIPTERA OF TREE TRUNKS—WITH DESCRIPTIONS OF TWO NEW SPECIES OF DRAPETIS (DIPTERA EMPIDIDAE) AND AN ABSTRACT OF A FINNISH PAPER ON DIPTERA OF TUOMIKOSKI. Pap. Mich. Acad. Sci. 38: 255-60. 4 refs. Observations on *Populus deltoides* and *Acer spp.* and a list with brief notes of species mentioned in the Finnish paper.

160.2

Jayme, G., and Reh, F. 1944. THE EFFECT OF AGE OF POPLAR-WOOD (POPULUS MONILIFERA) ON ITS CHEMICAL COMPOSITION AND SUITABILITY FOR PULP MANUFACTURE. Cellulosechemie 22: 65-72. Chem. Abstr. 40: 2978-80. 1946.

164.5

Marcet, E. 1961. UBER DIE GEOGRAPHISCHE VARIABILITÄT BLATT-MORPHOLOGISCHER MERKMALE BEI POPULUS DELTOIDES BARTR. [GEOGRAPHICAL VARIATION IN LEAF MORPHOLOGICAL CHARACTERS IN P. DELTOIDES.] Silvae Genet. 10(6): 161-72. 21 refs. [G.g.f.e.]

164.6

Nagaraj, M. 1952. FLORAL MORPHOLOGY OF POPULUS DELTOIDES AND P. TREMULOIDES. Bot. Gaz. 114(2): 222-43. 34 refs.

165.51

Gabriel, W. J. 1956. PRELIMINARY REPORT ON CLONAL DIFFERENCES IN THE WOOD AND PHLOEM OF POPULUS DELTOIDES AND P. FRICHOCARPA. Proc., 3rd Northeast. For. Tree Impr. Conf., Ithaca 1955: 33-4.

Data from individual trees indicated statistically significant differences in fibre length and *sp. gr.* between clones of the two species studied. Variations were also apparent in the fibre arrangement in the phloem. The material was from trees ≤ 5 years. Studies should be made on more mature trees to determine whether these juvenile traits are permanent or temporary.

165.71

Catalan, G. 1963. [CROSSES WITHIN THE SECTION LEUCE AND A NOTABLE HYBRID BETWEEN LEUCE AND AIGEIROS.] [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63-2b/8, 3 pp. [Span. span.]

Jovanovic, B., and Tucovic, A. 1959. ZAPAZANJA ODEJSTVU JONIZUJUĆEG ZRACENJA NA SEME I PRIRAST POPULUS VIRGINIANA FOUG. PRETHODNO SAOPSTENJE. [THE EFFECT OF IONIZING RADIATION ON SEEDS AND [SEEDLING] GROWTH OF P. DELTOIDES [$\times$ P. SEROTINA]. PRELIMINARY REPORT.] Sumarstvo 12(9/10): 451-62. 7 refs. [Serb. f.f.]

[New Zealand: Soil Conserv. Rivers Control Coun.] 1959. POPLAR INVESTIGATIONS. Extr. from Report, Soil Conservation and Rivers Control Council, Wellington 1958/1959: 26-9.

168 HISTOLOGY

Pelet, F., and Hildebrandt, A. C. 1957. GROWTH IN VITRO AT VARIOUS TEMPERATURES AND ACIDITIES OF TISSUES ISOLATED FROM GALLS AND NORMAL STEMS OF ELM, GRAPE, POPLAR AND WILLOW. Abstr. in Phytopathology 47(9): 531.

Optima for growth on two synthetic media with growth-promoting supplements are given from tests covering the temperature range from 16" C. by 4" to 36" and the acidity range from pH 3.5 to 8 at 26" C.

176.1

Boom, B. K. 1957. POPULUS CANADENSIS MOENCH VERSUS P. EURAMERICANA GUINIER. Acta Bot. Neerland. 6(1): 54.9. 16 refs. [E.e.]

Upholds the validity of the name *P. $\times$ canadensis* Moench, rejecting *P. $\times$ euramericana* Guinier, for the hybrids of *P. deltoides* $\times$ *P. nigra*.

Burdon. 1929. A HYBRID POPLAR (P. GENEROSA). L'Alpe 16: 528.

Dallimore. 1930. NOTE ON P. GENEROSA HENRY. Quart. J. For. 24: 118.

[International: FAO/Int. Poplar Comm.] 1959. NOMENCLATURE AND REGISTRATION [OF POPLAR HYBRIDS OF THE SECTION AIGEIROS]. [Docum.] 10th Sess. Int. Poplar Comm. 1959 No. FAO/CIP/97, 5 pp. [E.]

Includes an *annexe* by J. Pourtet, tracing the history of nomenclature refuting recently advanced arguments in favor of *Populus canadensis*, and concluding that the correct name for the group should be *Populus $\times$ euramericana* Guinier [cf. Boom, 1957, above].

Makowiecki, S. 1928. TOPOLA PIRAMIDALNA (POPULUS FASTIGIATA PERS.). Roczn. Polsk. Tow. Dendrol. 2, 66 pp.

Mocine. 1931. NOTE ON COTTONWOODS IN U.S.A. Amer. For. 37: 535.

Rose, J. N. 1913. POPULUS MACDOUGALLII: A NEW TREE FROM THE SOUTHWEST. Smithsonian Misc. Collect. 61(12).

Vill. 1931. NOTES ON P. MONILIFERA, ROBUSTA, ETC. Mitt. Hoh. Forst Bayerns 26: 87.

Wiese. 1882. NOTES ON P. DILATA. Allg. Forst- u. Jagdztg. 58: 333-6.

Zaborski. 1930. NOTE ON P. EUPHRATICA IN MOROCCO. Bot. Cur. Lit. 12: 7.

1933. ON P. EUPHRATICA IN MOROCCO. Biol. Abstr. 7: 6801.

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Anonymous. 1908. COTTONWOOD (P. DELTOIDES). U. S. For. Serv. Silv. Leaflet No. 25.

1941. THE SOUTHERN HARDWOODS-COTTONWOOD (POPULUS DELTOIDES "AR. VIRGINIANA, P. HETEROPHYLLA) Sth. Lumberman 162(2040): 29.

Allegri, E. 1954. A BRIEF NOTE ON POPULUS EUPHRATICA OLIV. IN IRAQ. [Pap.] Near East Poplar Conf. 1954, FAO, Rome No. FAO/NEPC/3 and 3 Add. 1, 6 pp. [E.]

Notes on silvicultural characters with a botanical description.

Joachim, H. F. 1954. BEITRAGE ZUR KENNTNIS VON POPULUS EURAMERICANA FORMA GELRICA HOUTZAGERS. [INFORMATION ON P. EURAMERICANA F. GELRICA.] Arch. Forstw. 3(1/2): 23-36. 9 refs. [G.g.]

Putnam, J. A., and Bull, H. 1931. TREES OF THE MISSISSIPPI DELTA: SOUTHERN COTTONWOOD. U. S. For. Serv. Sth. For. Exp. Sta. Occas. Pap. 27: 84-6.

Rodionenko, G. I. 1945. BIOLOGICHESKIE OSOBENNESTI TURANGI—POPULUS DIVERSIFOLIA SCHRENK. [BIOLOGICAL PECULIARITIES OF THE TURANGA—P. DIVERSIFOLIA.] Sovetsk. Bot. 13 (6): 35-40. Bblg. [Russ.]

Williamson, A. W. 1913. COTTONWOOD (P. DELTOIDES) IN THE MISSISSIPPI VALLEY. U. S. Dep. Agric. Bull. No. 24.

181.3

Brendemuehl, R. H. 1958. GROWTH, YIELD AND SITE REQUIREMENTS OF EASTERN COTTONWOOD (POPULUS DELTOIDES) Abstr. of thesis, in Iowa St. Coll. J. Sci. 32(2): 140-1.

Analyzes data as to stand and site characteristics including site index, soil texture, moisture, aeration and nutrient content, pH, etc., collected on 66 plots in pure even-aged stands in the floodplains of W. and S.W. Iowa. Available moisture and N-production capacity of the soil were the most important factors for growth.

181.31.1

Qadri, S. M. A. 1960. CONSERVATION OF WATER IN THE IRRIGATED PLANTATIONS. Pakistan J. For. 10(2):115-6.

181.341

Hinson, W. H. 1957. [THE STUDY OF NUTRITION OF FOREST SPECIES.] Rep. For. Res. For. Comm., Lond. 1956/57: 62.

181.4

Lawrence, D. B., and Hulbert, L. 1950. GROWTH STIMULATION OF ADJACENT PLANTS BY LUPINE AND ALDER ON RECENT GLACIER DEPOSITS IN SOUTHEASTERN ALASKA. Abstr. in Bull. Ecol. Soc. Amer. 31(3): 58.

181.521

May, S. 1959. UNA MANIFESTAZIONE DI BISESSUALITA NEL PIOPPO NERO AMERICANO. [A CASE OF BISEXUALITY IN POPULUS DELTOIDES.] Cellulosa e Carta 10(7): 6-8. 1 ref. [It.f.e.g.] Androgynous inflorescences were observed on a 4-year-old Pop-

ulus deltoides raised from seed obtained from Alabama. Seed has been collected from the tree and the resulting seedlings are under observation at Casale Monferrato. This is believed to be the first record of bisexuality in a black poplar, and its possible importance for breeding is discussed.

181.525

Hosner, J. F. 1957. EFFECTS OF WATER UPON THE SEED GERMINATION OF BOTTOMLAND TREES. For. Sci. 3(1):67-70. 6 refs.

1958. THE EFFECTS OF COMPLETE INUNDATION UPON SEEDLINGS OF SIX BOTTOMLAND TREE SPECIES. Ecology 39(2): 371-3. 5 refs.

1959. SURVIVAL, ROOT AND SHOOT GROWTH OF SIX BOTTOMLAND TREE SPECIES FOLLOWING FLOODING. J. For. 57(12): 927-8. 5 refs.

182.3

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2 SILVICULTURE

Schiemer, E. L. 1940. THE GROWING OF POPULUS DELTOIDES IN SOUTH AFRICA. J. S. Afr. For. Ass. No. 5: 17-28. Bblg.

23 1.32133

Johnson, R. L. 1962. WEED CONTROL AND SITE PREPARATION FOR NATURAL REGENERATION OF COTTONWOOD. Proc., 15th Ann. South. Weed Conf., pp. 181-4.

231.331

Burkhardt, E. C. 1962. REFORESTATION BREAKTHROUGH. GIANT FLOW PRODUCES FIRST COMMERCIAL COTTONWOOD PLANTATION FROM SEED. Sth. Lumberman 204(2544):39-40. 1 ref.

232/232.1

Lin, C. -W. 1963. [PRELIMINARY STUDY ON THE INTRODUCTION OF POPULUS EUPHRATICA ON SALINE SOIL OF THE COASTAL REGION OF N. CHINA.] Sci. Silvae, Peking 8(3): 248-55. 5 refs. [Chin.]

232.1

Pratt, E. R. 1950. THE FASTEST GROWING TREE. Quart. J. For. 44(3): 142-4.

232.1.1

[Bechuanaland.] [1951.] [POPULUS DELTOIDES PLANTATION IN BECHUANALAND.] Rep. For. Dep. Bechuanaland 1950: 1.

Djekov, S. 1957. 1958. POPULUS VIRGINIANA FOUG. VO SKOPJE I NEGOVATA OKOLINA. DENDROLOSKA I DENDROMETRIJSKA KARAKTERISTIKA. [P. VIRGINIANA IN SKOPJE AND ITS VICINITY. DENDROLOGICAL AND MENSURATIONAL NOTES.] God. Zborn. Zemj.- Sum. Fak. Univ. Skopje (Sum.) No. 11: 5-27. 8 refs. [Maced.g.g.]

232.13

Larsen, C. S. 1936. NOTES ON THE REMARKABLE GROWTH OF SOME SPECIMENS OF HENRY'S POPLAR (P. GENEROSA). Dansk Skovforen. Tidsskr. 5: 239-41.

232.21

Jones, E. P. 1959. WET SITE SURVIVAL AND GROWTH. U. S. FOR. SERV. SOUTHEAST. For. Exp. Sta. Res. Note No. 130, 2 pp. 2 refs.

232.3

Engstrom, A. 1948. GROWING COTTONWOOD FROM SEED. J. For. 46(2): 130-2.

232.315.2

Gammage, J. L., and Maisenhelder, L. C. 1960. REFRIGERATION PROLONGS VIABILITY OF COTTONWOOD (POPULUS DELTOIDES?) SEED. U. S. For. Serv. Tree Plant. Notes No. 43: 5-6. Seed was stored (a) in a refrigerator at 40° F., (b) in nylon mesh

bags indoors at ca. 75° and (c) as (b) but hung in the shade of a cottonwood tree. The seed had been collected in July from partially opened catkins. Germination was tested daily for 25 days. Seed in lot (c) deteriorated rapidly, germinating poorly after less than 1 week of storage; (b) maintained viability for ca. 1 week; (a) maintained viability for 3-5 weeks.

McComb, A. L., and Lovestead, H. S. 1954. VIABILITY OF COT. TONWOOD (POPULUS DELTOIDES) SEEDS IN RELATION TO STORAGE TEMPERATURES AND HUMIDITIES. U.S. For. Serv. Tree Plant. Notes No. 17: 9-11.

Experiments showed that optimum conditions of storage were a temperature of 10° F. with relative humidity 25%. The data suggest that at low temperatures humidity is a critical factor.

232.318

Jovanovic, B., and Tucovic, A. 1959. ZAPAZANJA O DEJSTVU JONIZUJUĆEG ZRACENJA NA SEME I PRIRAST POPULUS VIRGINIANA FOUG. PRETHODNO SAOPSTENJE. [THE EFFECT OF IONIZING RADIATION ON SEEDS AND [SEEDLING] GROWTH OF P. DELTOIDES [X P. SEROTINA]. PRELIMINARY REPORT.] Sumarstvo 12(9/10): 451-62. 7 refs. [Serb.f.f.]

232.323.1

Wycoff, H. B. 1960. COTTONWOOD SEEDING AT THE MASON STATE TREE NURSERY. U. S. For. Serv. Tree Plant. Notes No. 41: 13. Describes a method of sowing Populus deltoides, by suspending catkins from slatted covers over the seedbeds. Burlap is placed over the covers to confine the cotton, and irrigation does not begin until enough seed had been dispersed over the bed.

232.328.1

Allen, R. A., and McComb, A. L. 1955. UBERFAKTOREN, DIE DIE BEWURZELUNG DER STECKLINGE "ON DES POPULUS DELTOIDES BARTR. BEEINFLUSSEN. [FACTORS AFFECTING THE ROOTING OF P. DELTOIDES CUTTINGS.] Zbl. Ges. Forstw. 74(4): 199-220. 88 refs. [G.g.]

Allen, R. M., and McComb, A. L. 1956. ROOTING OF COTTONWOOD CUTTINGS. U. S. For. Serv. Sth. For. Exp. Sta. Occas. Pap. No. 151, 10 pp. 7 refs.

A shortened version of the paper published in Zbl. Ges. Forstw. 74(4): 199-220. 1955.

Briscoe, C. B. 1963. ROOTING CUTTINGS OF COTTONWOOD, WILLOW, AND SYCAMORE. J. For. 61(1): 51-3. 6 refs.

Stem cuttings from young Populus deltoides, Salix nigra, and Platanus occidentalis were collected monthly. All species rooted every month, but March was best and June worst. Basal cuttings rooted better than top cuttings. S. nigra rooted and grew faster than P. deltoides which grew faster than P. occidentalis.

Broekhuizen, J. T. M. 1961. HET STEKKEN VAN ENKELE BOOMSOORTEN ONDER WATERNEVEL. [ROOTING CUTTINGS OF SOME TREE

SPECIES UNDER MIST SPRAY.] Ned. Boschb.-Tijdschr. 33 (11): 313-25. 1 ref. [Du.du.e.]

1963. [FURTHER EXPERIENCE OF ROOTING CUTTINGS UNDER MIST SPRAY.] Ned. Boschb.-Tijdschr. 35(11): 435-44. 1 ref. [Du.e.e.]

Cunningham, F. E. 1953. ROOTING ABILITY OF NATIVE COTTONWOODS DEPENDING ON THE CLONE USED. U. S. For. Serv. Ntheast. For. Exp. Sta. Res. Note No. 26, 2 pp. 1 ref.
Rooting percent for cuttings from 30 clones of *P. deltoides* ranged from averages (of 4 replicates for each clone) of 3 up to 100 percent. Rooting for 30 clones of hybrid *poplars* ranged from averages of 92 to 100 percent.

[International: FAO/Int. Poplar Comm.] 1959. RAPPORTS D'ACTIVITES DES COMMISSIONS NATIONALES DU PEUPLIER. REPUBLIQUE ARABE UNIE: REGION SYRIENNE. [REPORTS OF THE ACTIVITIES OF THE NATIONAL POPLAR COMMISSIONS: SYRIA.] [Docum.] 10th Sess. Int. Poplar Comm., 1959 No. FAO/59/7/5626, 8 pp. [F.]
Populus euphratica was successfully propagated from cuttings without special treatment. Some information on pests and on the areas under various poplars is given.

Reinders-Gouwentak, C. A. 1953. VEGETATIVE PROPAGATION OF POPULUS CUTTINGS FROM SOUTH AFRICA IN SPRING IN THE NETHERLANDS. Proc. Ned. Akad. Wet. 56C(1): 66-70. 4 refs. [E.e.]

[U.S.A.: Cent. St. For. Exp. Sta.] 1959. VEGETATIVE PROPAGATION OF POPLARS. Rep. U. S. For. Serv. Cent. St. For. Exp. Sta. 1958: 33-4.

[U.S.A.: Sth. For. Exp. Sta.] 1957. [ROOTING OF COTTONWOOD CUTTINGS.] Rep. U. S. For. Serv. Sth. For. Exp. Sta. 1956: 24.
Cuttings from the current-year top of mature trees rooted less well than cuttings from the current-year top of plants recently raised from seed. Only 32% of cuttings taken from previously rooted topwood cuttings struck roots, compared with 55% from stools of more recent seedling origin. Auxin did not improve rooting ability of either type.

232.4

Bull, H., and Muntz, H. H. 1943. PLANTING COTTONWOOD ON BOTTOMLANDS. Bull. Miss. Agric. Exp. Sta. No. 391, 18 pp.

— and Putnam, J. A. 1941. FIRST-YEAR SURVIVAL AND HEIGHT GROWTH OF COTTONWOOD PLANTATIONS AT STONEVILLE, MISS. U. S. For. Serv. Sth. For. Exp. Sta. Occas. Pap. No. 98, 16 pp.

232.4 1

Bull, H. 1941. COTTONWOOD WILDLINGS MAKE GOOD PLANTING STOCK. U. S. For. Serv. Sth. For. Exp. Sta. Sth. For. Notes No. 37, p. 1.

232.5

Moore, H. 1958. PLANTING COTTONWOOD CUTTINGS. Proc., 7th For. Symp. La. Sch. For., pp. 10-5. 17 refs.
Describes methods used in direct planting of cottonwood [*Populus deltoides*] cuttings, with details of costs and returns. Though cuttings can be taken from natural stands, it is more convenient to take them from nursery stock planted 1 ft. apart in rows 40 in. apart.

Nelson, T. C. 1957. SURVIVAL AND EARLY GROWTH OF AN EASTERN COTTONWOOD PLANTATION IN THE PIEDMONT. U. S. For. Serv. Tree Plant. Notes No. 28: 9.
Half an acre of floodland was disc harrowed and planted with unrooted cuttings of *Populus deltoides* at 9 x 9 ft., with ca. 14 in. underground and ca. 6 in. above. The area was flooded for 3 days after planting, and again for 3 days after leafing had begun. Over 88% rooted and survived the first growing season, and average height growth was 7 ft.

233 AFFORESTATION

Maisenhelder, L. C., and Heavrin, C. A. 1957. SILVICS AND SILVICULTURE OF THE PIONEER HARDWOODS—COTTONWOOD AND WILLOW. Proc. Soc. Amer. For. 1956: 73-5.
Describes the silvicultural characters of *Populus deltoides* and *Salix nigra*, which are pioneer species on the "new land" of the Mississippi meanders, and makes recommendations for planting these species on such sites.

Maloney, M. M. 1942. REVEGETATION OF COAL STRIPPED LAND NEAR HENRYETTA, OKLAHOMA. Proc. Okla. Acad. Sci. 22: 123-9.

238 TIMBER PLANTATION CROPS REQUIRING SPECIAL TREATMENT

Maisenhelder, L. C. 1951. PLANTING AND GROWING COTTONWOOD ON BOTTOMLANDS. Bull. Miss. Agric. Exp. Sta. No. 485, 23 pp.
Supersedes an earlier bulletin [Bull. and Muntz, 1943, *P. deltoides* to *P. generosa*, 232.41, and gives information on nursery practice, planting, tending, protection, and costs of establishing plantations of *Populus deltoides* on floodlands of the great southern rivers.

1960. COTTONWOOD PLANTATIONS FOR SOUTHERN BOTTOMLANDS. U. S. For. Serv. Sth. For. Exp. Sta. Occas. Pap. No. 179, 24 pp.
The bulletin, summarizing 18 years of research at Stoneville, Mississippi, supersedes an earlier one published in 1951.

May, S. [1960?] CULTURE INTENSIVE DU PEUPLIER DANS UNE PROPRIETE SUR DU TERRAIN DE BONIFICATION A CODIGORO. [INTENSIVE POPLAR CULTIVATION NEAR CODIGORO [FERRARA] ON RECLAIMED LAND.] Istituto di Sperimentazione per la Pioppicoltura, Casale Monferrato, Italy. 16 pp. [F.]

Metreveli, P. A. 1952. KULTURY TOPOLJA KANADSKOGO V KOLCHIDE. [PLANTATIONS OF POPULUS DELTOIDES IN COLCHIS (GEORGIA).] Lesn. Hoz. 5 (1): 37-8. [Russ.]

242 THINNINGS

Georgopoulos, A. 1955. ERSTE ERGEBNISSE EINES DURCHFÖRSTUNGSVERSUCHES BEI DER PAPPEL. [FIRST RESULTS OF A THINNING STUDY ON POPLAR.] Schweiz. Z. Forstw. 106(5): 273-86. [G.f.]
Sample plots of two very dense stands of poplar (probably *P. deltoides* var. *monilifera*) were thinned at about 10 years old and remeasured 2 years later. Mensurational data are given. The residual stands reacted very favorably. Thinnings should be made early and often, the last taking place before the trees have finished their height growth (20-30 years).

Johnson, J. W. 1950. COTTONWOODS RESPOND TO SELECTION CUTS. U. S. For. Serv. Sth. For. Exp. Sta. Sth. For. Notes No. 66, p. 2.

Obye, K. D. 1958. THINNING COTTONWOOD AND WILLOW (*Salix nigra*). Proc., 7th For. Symp. La. Sch. For., pp. 35-41. 5 refs.
Summarizes several experiments in thinning dense natural stands.

[U.S.A.: Cent. St. For. Exp. Sta.] 1959. EASTERN COTTONWOOD RESPONDS TO THINNING. Rep. U. S. For. Serv. Cent. St. For. Exp. Sta. 1958: 42-3.

An 8-year-old stand of *Populus deltoides* thinned from 85 sq. ft. b.a. to 50 sq. ft., put on 2.4 in. diam. increment in 5 years (185 trees/acre), vs. 1.7 in. for control (268/acre). Volume increment in cu. ft. was the same in both.

244 CLIMBER CUTTING, ETC.

[U.S.A.: Sth. For. Exp. Sta.] 1961. VINES AND COTTONWOOD GROWTH. Extr. from Rep. U. S. For. Serv. Sth. For. Exp. Sta. 1960. 8-9. 1 ref.

245.1

Johnson, R. L. 1961. PRUNING COTTONWOOD AND WILLOW OAK. U. S. For. Serv. Sth. For. Exp. Sta. Sth. For. Notes No. 136, p. 2.
In willow oak aged 25-30 years, pruned to 17.4 ft., healing was slower than in cottonwood. Cuts from live branches healed faster than those from dead ones; 96 and 98% of wounds had healed after the 4th year. Insect and rot damage were also more prevalent in the oak. Oak developed epicormics to an extent that degraded many butt logs.

245.13

Johnson, R. L. 1959. PRUNING COTTONWOOD. Sth. Lumberman 198(2473): 28-9.

In a 14-year stand spaced 8 x 8 ft. in Mississippi, 13 trees averaging ca. 9 in. d.b.h. and 50 ft. in height, were pruned to 17.4 ft. Wounds, mostly from live branches less than 2½ in. in diameter, nearly all healed within 2 years. Rot and infection, and growth of epicormics, were slight. Growth was not affected, but in other, younger, stands it was reduced by pruning, suggesting that no more than half the living crown should be removed.

266 SHELTERBELTS, WINDBREAKS

Andreae, E. 1953. LERIDEAU-ABRI DE L'ÉPINETTE ET SES PEUPLIERS. [THE EPINETTE SHELTERBELT AND ITS POPLARS.] Forêt,

Neuchâtel 7(2): 22-4. [F.]

Gives data on the volumes of a number of "Carolina" poplars felled *at* different times in Swiss shelterbelts, particularly in that *at* Epinette, established in 1912 with plants of unknown origin.

4 FOREST INJURIES AND PROTECTION

441 FOREST WEEDS

Kuntz, J. E., and Riker, A. J. 1950. CHEMICAL CONTROL OF WOOD COMPETITION IN FOREST PLANTATIONS. Abstr. in Res. Rep. 7th Ann. Nth. Cent. Weed Control Conf., pp. 242-3.

443 FUNGI AND BACTERIA

Benben, K. 1954. NOWE CHOROBY TOPOLI. [NEW DISEASES OF POPLARS.] Sylwan 98(2): 91-5. 7 refs. [Pol.]

Nagel, C.M. 1949. LEAF RUST RESISTANCE WITHIN CERTAIN SPECIES AND HYBRIDS OF POPULUS. Abstr. in Phytopathology 39(1): 16.

443.3

Boyer, M.G. 1961. A FUSARIUM CANKER DISEASE OF POPULUS DELTOIDES MARSH. Canad. J. Bot. 39: 1195-204. 20 refs. (Contr. Div. For. Biol. Dep. Agric. Can. No. 655.)

Butin, H. 1955. UBER DEN EINFLUSS DES WASSERGEHALTES DER PAPPEL AUF IHRE RESISTENZ GEGENÜBER CYTOSPORA CHRYSOSPERMA (PERS.) FR. [EFFECT OF THE WATER CONTENT OF POPLAR ON ITS RESISTANCE TO C. CHRYSOSPERMA.] Phytopath. Z. 24(3): 245-64. 18 refs. [G.g.]

1956. UNTERSUCHUNGEN UBER RESISTENZ UND KRANKHEITSANFÄLLIGKEIT DER PAPPEL GEGENÜBER DOTHICIZA POPULEA (SACC. ET BR.) [STUDIES ON THE RESISTANCE AND SUSCEPTIBILITY OF POPLAR TO D. POPULEA.] Phytopath. Z. 28(4): 353-74. 23 refs. [G.g.]

Morioondo, F. 1958. SU "NA MORIA DI PIOPPI IN "AL DI NIEVOLE. [[FUNGUS] DAMAGE TO POPLARS IN THE VAL DI NIEVOLE.] Ann. Accad. Ital. Sci. For. 7: 189-95. 13 refs. [It.f.] Describes *the damage caused by Stereum purpureum* to stands of Populus 'Eucalyptus'.

Ogawa, J.M. 1954. THE OCCURRENCE OF HENDERSONULOTORULOIDEA NATTRASS ON POPULUS SPECIES IN CALIFORNIA. U.S. Dep. Agric. Plant Dis. Repr. 38(3): 238. 3 refs.

H. toruloidea, a major pathogen of Persian walnut and fast becoming a serious menace of citrus and fig in California, was isolated from dead poplar (P. fremontii) and from dead branches on living poplar in Fresno County.

Schmidle, A. 1955. UBER INFektionsVERSUCHE MIT SEPTOTIS POPULIPERDA WATERMAN ET CASH AN POPULUS DELTOIDES. [INOCU-

LATION EXPERIMENTS WITH S. POPULIPERDA ON P. DELTOIDES.] Angew. Bot. 29(1): 14-25. 7 refs. [G.g.]

Wright, E. 1957. CYTOSPORA CANKERS OF COTTONWOOD. U.S. Dep. Agric. Plant Dis. Repr. 41(10): 892-3.

453 INSECTS

Grobler, J. H. 1958. DAMAGE CAUSED BY GALL APHIS NEGLIGIBLE. Fmg. S. Afr. 34(2): 47-8.

Ignoffo, C.M. 1958. THE LIFE HISTORY AND GALL DEVELOPMENT OF MORDWILKOJA VAGABUNDA WALSH, (HOMOPTERA: APHIDIDAE) ON POPULUS DELTOIDES MARSH. Abstr. of thesis, in Dissert. Abstr. 18(1): 338-9. [Univ. Minn.]

— and Granovsky, A. A. 1961. LIFE HISTORY AND GALL DEVELOPMENT OF MORDWILKOJA VAGABUNDA (HOMOPTERA: APHIDIDAE) ON POPULUS DELTOIDES. PART I - LIFE HISTORY. PART II - GALL DEVELOPMENT. Ann. Ent. Soc. Amer. 54(4): 486-99; (5): 635-41. (I) Contains a taxonomic review of the species, descriptions of all known stages, and an account of its life history in the Minneapolis-St. Paul area of Minnesota. (II) Describes gall formation and development in detail.

Kudler, J. 1961. [POSSIBILITIES OF CONTROLLING SAPERDA POPULNEA.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 7(7): 619-34. 30 refs. [Cz.cz.russ.e.]

[U.S.A.: Sth. For. Exp. Sta.] 1958. YOUNG COTTONWOODS DAMAGED BY TWIG BORER. Rep. U. S. For. Serv. Sth. For. Exp. Sta. 1957: 15.

A twig borer, tentatively identified as Gypsonoma sp., probably haimbachiana, severely injured the terminals of young cottonwoods in the Mississippi region, causing stunted *bushy growth*. The overwintering larvae enter the *twigs* in *early* spring. Several generations may *develop in 1 year*.

[U.S.A.: Sth. For. Exp. Sta.] 1963. [INSECTS AFFECTING COTTONWOOD.] Extr. from Rep. U. S. For. Serv. Sth. For. Exp. Sta. 1962: 41.

Wickman, B. E. 1963. THE LARGE ASPEN TORTRIX, CHORISTONEURA CONFLICTANA, IN CALIFORNIA (LEPIDOPTERA: TORTRICIDAE). J. Econ. Ent. 56(5): 593-6. 4 refs.

Describes with notes on *the* life-history and parasites of *the insect*, the first outbreak in the *state* of this defoliator of Populus tremuloides. First found in California in 1922, *it had rarely* been collected there, since.

5 FOREST MENSURATION

524.315

Chopra, R.S. 1939. PRELIMINARY VOLUME TABLES FOR BHAN (POPULUS EUPHRATICA OLIV.). Punjab For. Rec. Silva Publ. 1(6). 9 pp.

531 CROWN DIMENSIONS, CROWN AREA, CROWN VOLUME, CROWN RATIO

Berlyn, G.P. 1962. SOME SIZE AND SHAPE RELATIONSHIPS BETWEEN TREE STEMS AND CROWNS. Iowa St. J. Sci. 37(1): 7-15. 11 refs.

54/56

Sipovic, V.V. 1963. [INVESTIGATION OF THE GROWTH OF POPULUS DIVERSIFOLIA STANDS.] Lesn. Z., Archangel'sk 6(2): 27-8. [Russ.]

Presents a *table* for determining *site class by tree* height, and yield tables for site classes I, II, and III for ages 15, 16, and 17

-30 years, based on measurements on 176 sample plots *and* 1,120 sample *trees* in Soviet Central Asia.

541 BASED ON HEIGHT, DIAMETER, VOLUME, ETC.

Broadfoot, W.M. 1960. FIELD GUIDE FOR EVALUATING COTTONWOOD SITES. U. S. For. Serv. Sth. For. Exp. Sta. Occas. Pap. No. 178, 6 pp.

Two keys are given: (a) applicable only to sites in the Mississippi floodplain, based on soil texture, drainage, and moisture; and (b) requiring determination *of the* soil series.

Neebe, D. J., and Boyce, S. G. 1959. SITE INDEX CURVES FOR EASTERN COTTONWOOD (POPULUS DELTOIDES). U.S. For. Serv. Cent. St. For. Exp. Sta., Sta. Note No. 126, 2 pp.

Data were collected from *172 trees*, mainly 11-32 *years* old, in four States. The curves, presented as straight lines, show the heights attained by *the* trees at 25 years. *Average* site index was 98 for bottomland, and 78 for upland *and* spoil-bank areas.

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Minckler, L. S., and Lamendola, P. E. 1953. **GROWTH OF A WELL-STOCKED COTTONWOOD STAND**. U. S. For. Serv. Cent. St. For. Exp. Sta., Sta. Note No. 75, 2 pp.
Gives figures showing changes in *the* number of live trees and bd.ft. values/acre for different diameter classes between 1949 and 1953.

Pratt, E. R. 1953. **POPULUS EUGENEI**. Quart. J. For. 47(1): 28-32.

Further *data on increment* of *P. eugenei*.

Walker, N. 1957. **JUVENILE DEVELOPMENT OF A COTTONWOOD STAND IN CENTRAL OKLAHOMA**. J. For. 55(1): 34-5.

In 1946 a *1/8-acre plot was laid out in a naturally* established stand of 2- to 3-year cottonwood seedlings. Black willow stems were removed *by* weeding. Its development over the *10-year* period *is* described and d.b.h., *b.a.* increment and vol. (in *cu.ft.*)/acre are tabulated.

6 FOREST MANAGEMENT

Swenning, 1924. **COTTONWOOD AND SILVER MAPLE, MANAGEMENT**. J. For. 22: 178.

61 FOREST MANAGEMENT: GENERAL, THEORY AND PRINCIPLES

Switzer, H. D. 1948. **THE MANAGEMENT OF COTTONWOOD IN THE BOTTOMLANDS OF SOUTHERN ILLINOIS**. Sth. Lumberman 177 (2225): 153-7. 3 refs.

613 EXPLOITABILITY AND ROTATION

Anonymous. 1926. **COTTONWOOD CUT IN 40-YEAR ROTATION**. Amer. For. 32: 636.

651.5

Anonymous. 1928. **ECONOMIC AGE FOR CUTTING P. EUPHRATICA IN BOMBAY**. For. Res. India 1928-29: 51.

———. 1929. **ECONOMIC AGE FOR CUTTING BAHANP. EUPHRATICA**. For. Res. India, p. 51.

8 FOREST PRODUCTS AND THEIR UTILIZATION

81 WOOD AND BARK: STRUCTURE AND PROPERTIES

Klauditz, W. 1951. **UBER DIE MECHANISCHEN EIGENSCHAFTEN UND CHEMISCHE ZUSAMMENSETZUNG DES STAMMHOLZES ZWEIER PAPPEL-HYBRIDEN**. [MECHANICAL PROPERTIES AND CHEMICAL COMPOSITION OF THE STEM WOOD OF TWO POPLAR HYBRIDS.] Holz Roh- u. Werkstoff 9(5): 81-4. 11 refs. [G.g.]

810 GENERAL INFORMATION ON WOODS

Anonymous. 1944. **FOUR AMERICAN WOODS: FACTS ABOUT WHITE OAK, COTTONWOOD, SHORTLEAF PINE AND SUGAR PINE**. Timb. Tr. J. 169(3529): 109-10.

Betts, H. S. 1943. **AMERICAN WOODS: COTTONWOOD**. U. S. For. Serv. 10 pp. Bblg.

81 1.156

Boyce, S. G., and Kaeiser, M. 1960. **SMALL INCREMENT CORES CAN BE USED FOR SAMPLING COTTONWOOD FIBERS**. J. For. 58(6): 484-5. 3 refs.

It was found that mean fibre length in *Populus deltoides* can be accurately determined from *small* increment cores (5.2 mm. diameter). Measurements were the same from these small cores as from large cores or wedge-shaped sections. The method is rapid and easy, does little damage to trees, and can be applied to species where the *maximum* length of the fibre does not exceed 2 mm.

——— and Kaeiser, M. 1961. **ENVIRONMENTAL AND GENETIC VARIABILITY IN THE LENGTH OF FIBERS OF EASTERN COTTONWOOD (POPULUS DELTOIDES)**. Tappi 44(5): 363-6. 15 refs.

Kaeiser, M. 1956. **VARIATIONS IN FIBER LENGTH OF EASTERN COTTONWOOD**. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. 2047, 4 pp. 5 refs.

——— and Stewart, K. D. 1955. **FIBER SIZE IN POPULUS DELTOIDES MARSH. IN RELATION TO LEAN OF TRUNK AND POSITION IN TRUNK**. Bull. Torrey Bot. Cl. 82(1): 57-61. 7 refs.

[U.S.A.: Cent. St. For. Exp. Sta.] 1959. **FIBRE LENGTH OF COTTONWOOD**. Rep. U. S. For. Serv. Cent. St. For. Exp. Sta. 1958: 39. Mean fibre length was found *to increase, the* faster the height and diameter growth and *the* older the tree. These influences *accounted* for 60% of the variability in fibre length among *the* 83 trees studied, *the remaining* 40% probably being hereditary.

81 1.22

Berlyn, G. P. 1959. **A BIOMETRIC TECHNIQUE FOR REACTION TISSUE RESEARCH**. Proc. Iowa Acad. Sci. 66: 98-102. 4 refs.

Kaeiser, M. 1955. **FREQUENCY AND DISTRIBUTION OF GELATINOUS FIBRES IN EASTERN COTTONWOOD**. Amer. J. Bot. 42(3): 331-4.

——— and Pillow, M. Y. 1955. **TENSION WOOD IN EASTERN COTTONWOOD**. U. S. For. Serv. Cent. St. For. Exp. Sta. Tech. Pap. No. 149, 9 pp.

812.31

Peterson, K. R., Guiher, J. K., and Walters, C. S. 1959. **THE SPECIFIC GRAVITY OF EASTERN COTTONWOOD [POPULUS DELTOIDES] GROWN IN ILLINOIS**. For. Note Ill. Agric. Exp. Sta. No. 86, 2 pp. 1 ref.

The average specific gravity for *P. deltoides* grown in Illinois was the same as that throughout its natural range.

812.7

Venet, J. 1955. **ESSAIS SUR LA RESISTANCE MECANIQUE DU BOIS DE PEUPLIER FAITS AU LABORATOIRE DE TECHNOLOGIE DE L'ECOLE NATIONALE DES EAUX ET FORETS**. [TESTS OF THE MECHANICAL STRENGTH OF POPLAR WOOD MADE AT THE ECOLE DES EAUX ET FORETS, NANCY.] Annexe to [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-B: 9-12. [F.]
Gives *the* results of tests on *P. deltoides* ("*carolinensis*"), *P. regenerata*, and *P. tremula*.

813.14

Karacsonyi, S. 1962. [STUDY OF HEMICELLULOSES FROM BROAD-LEAVED TREES.] Drev. Vyskum 1962(3): 233-49. 25 refs. [Slovak. russ.g.e.]

813.6

Hanson, N. S. 1947(1948). **EFFECT OF TREATMENTS WITH AMMONIUM SULPHATE AND SODIUM CHLORATE ON STUMPS OF COTTONWOOD (POPULUS DELTOIDES)**. Abstr. in Res. Rep. 4th Ann. Nth. Cent. Weed Control Conf., p. 260.

815.5

Baudendistel, M. E., and Akins, V. 1946. **HIGH LONGITUDINAL SHRINKAGE AND GELATINOUS FIBERS IN AN ECCENTRIC COTTONWOOD**. Log. J. For. 44(12): 1053-7.

Haskell, H. H. 1958. STRENGTH PROPERTIES OF TENSION WOOD AND TYPICAL WOOD IN A LEANING EASTERN COTTONWOOD TREE. For. Prod. J. 8(1): 17-22. 7 refs.

Wahlgren, H. E. 1957. EFFECT OF TENSION WOOD IN A LEANING EASTERN COTTONWOOD. For. Prod. J. 7(6): 214-9. 13 refs.

831.2

Ishaq, S. M. 1960. THE USE OF TIMBER IN COAL MINES. Pakistan J. For. 10(2): 127-32.

An account of the types and dimensions of timber (mainly *Acacia arabica* and *Populus euphratica*) used in the coal mines of Baluchistan, consumption, supplies, and the need for plantations to ensure a sufficient supply.

832.3

Pratt, E. R. 1954. ROTARY VENEERS. Quart. J. For. 48(4): 297-9. Comments on the Report of the Matchwood Working Party, dealing mainly with available supplies of logs suitable for rotary veneer cutting for matchboxes and match stock. The writer questions the statement that it is impossible to grow sufficient quantities in Britain, *Populus eugenei* is almost as satisfactory as aspen for this purpose, and grows much faster and larger.

834.1

Walters, C. S. 1942. COTTONWOOD SHINGLES FOUND ON ILLINOIS PIONEER'S HOME. J. For. 40(6): 507-8.

847.2

Walters, C. S. 1955. KILN-DRYING GREEN EASTERN COTTONWOOD [POPULUS DELTOIDES]. For. Note Ill. Agric. Exp. Sta. No. 53 (rev.), 2 pp.

852.16

Berlyn, G. P. 1961. FACTORS AFFECTING THE INCIDENCE OF REACTION TISSUE IN POPULUS DELTOIDES BARTR. Iowa St. J. Sci. 35(3): 367-424. 58 refs.

1961. FACTORS AFFECTING THE INCIDENCE OF REACTION TISSUE IN POPULUS DELTOIDES BARTR. Abstr. of thesis, in Dissert. Abstr. 21(7):1689-90. [Iowa State Univ. of Sci. and Tech.]

Clark, W. P. 1956. EFFECT OF TENSION WOOD ON SEASONING AND MACHINING OF EASTERN COTTONWOOD. For. Prod. J. 8(3):109-12. 8 refs.

Lassen, L. E. 1959. TENSION WOOD IN EASTERN COTTONWOOD, ITS EFFECT ON DENSITY, TOUGHNESS, AND COMPRESSION. For. Prod. J. 9(3):116-20. 12 refs.

Describes tests with matched samples from the upper and lower sides of five *Populus deltoides* stems having leans of $>10\%$. The upper, tension-wood side was generally heavier, tougher, and slightly more elastic, but weaker in compression. Toughness was apparently more related to position than to specific gravity, being greatest near the bark (i.e., where there was the greatest amount of gelatinous fibres).

McCoy, E.W. 1957. HOW TO MINIMIZE THE EFFECTS OF TENSION WOOD IN COTTONWOOD. U. S. For. Serv. Cent. St. For. Exp. Sta., Sta. Note No. 103, 2 pp. 4 refs.

Recommendations for reducing losses in *Populus deltoides* caused by tension wood, include: (1) to remove in thinnings all trees with a lean $\geq 4^\circ$; (2) to mark during logging the upper face of trees with such a lean and to discard in the sawmills that portion under the upper face.

852.17

Clark, W. P. 1960. COTTONWOOD TROUBLEMAKER. TENSION WOOD CAUSES DIFFICULTY IN SEASONING AND MACHINING. Sth. Lumberman 201(2505): 31-34.

861.11

Schafer, E. R., and Pew, J. C. 1942. GRINDING AND NEWSPRINT PAPER EXPERIMENTS ON SOUTHERN SUGARBERRY, ASH, COTTONWOOD, WILLOW, AND ELM. U.S. For. Serv. For. Prod. Lab., Madison Mimeo No. R1410, 4 pp.

861.15

McGovern, J. N., and Keller, E. L. 1942. SULFITE PULPS FROM SEVERAL SOUTHERN HARDWOODS. U. S. For. Serv. For. Prod. Lab., Madison Mimeo No. R1409, 5 pp. Bblg.

9 FORESTS AND FORESTRY FROM THE NATIONAL AND INTERNATIONAL POINTS OF VIEW

902 HISTORY OF FORESTS AND FORESTRY

Fournier, P. 1954. HISTOIRE DU POPULUS EUPHRATICA OLIV. [HISTORY OF P. EUPHRATICA.] Bull. Soc. Bot. France 101(112): 6-8. [F.]

A review based on literature.

945.35

Giordano, E. 1959(1960). IL POPULUS DELTOIDES BARTR. NEL SUO PAESE DI ORIGINE. NOTA PRELIMINARE SU UN VIAGGIO DI STUDIO.

[P. DELTOIDES IN ITS NATIVE HABITAT. PRELIMINARY NOTE ON A STUDY TOUR.] Pubbl. Cent. Sper. Agric. For., Roma No. 3: 127-80. 55 refs. [It. i. e. e.]

Notes on a tour made by the author in the U.S.A. in 1958, giving particular attention to natural stands of *P. deltoides* in the lower Mississippi, Louisiana, Arkansas, and Illinois. Visits were also made to stands of natural hybrids of *P. alba* $\times$ *P. grandidentata* and plantations of artificial hybrids

P. GRANDIDENTATA TO P. JAPONO-GIGAS

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

114.351

Schnitzer, M., and Delong, W. A. 1955. INVESTIGATIONS ON THE MOBILIZATION AND TRANSPORT OF IRON IN FORESTED SOILS. II. THE NATURE OF THE REACTION OF LEAF EXTRACTS AND LEACHATES WITH IRON. Proc. Soil Sci. Soc. Amer. 19(3): 363-8. 13 refs.

160.22

Pearl, I. A., and Darling, S. F. 1963. STUDIES ON THE LEAVES OF THE FAMILY SALICACEAE. II. QUERCETIN-3—GLUCOSIDURONIC ACID

FROM POPULUS GRANDIDENTATA LEAVES. J. Organ. Chem. 28(5): 1442. 4 refs.

Darling, S. F., and Justman, O. 1962. STUDIES ON THE LEAVES OF THE FAMILY SALICACEAE. I. POPULIN FROM THE LEAVES OF POPULUS GRANDIDENTATA AND POPULUS TREMULOIDES. J. Organ. Chem. 27(7): 2685-7. 11 refs.

Pridham, J. B. 1960. OLIGOSACCHARIDES AND ASSOCIATED GLYCOSIDASES IN ASPEN TISSUES. Biochem. J. 76(1): 13-7. 43 refs.

161.2

Faust, M. E. 1936. GERMINATION OF *POPULUS GRANDIDENTATA* AND *P. TREMULOIDES*, WITH PARTICULAR REFERENCE TO OXYGEN CONSUMPTION. Bot. Gaz. 97(4):808-21. Plant Sci. Lit. 4(1): 5. 1936.

164.5

Negisi, K., Yagi, K., and Satoo, T. 1958. [SEASONAL VARIATION IN LEAF SIZE OF YOUNG POPLAR PLANTS WITH SPECIAL REFERENCE TO HEIGHT GROWTH.] J. Jap. For. Soc. 40(12): 499-504. 3 refs. [Jap.jap.e.e.]

Presents data based on observations made mainly on *Populus japono-gigas*, the total leaf area of which was measured at 10-day intervals by the "dot-counting" method and studied in relation to the mean increases in leaf size and stem height occurring over the same periods.

164.6

Cavanagh. 1931. ABNORMAL FLOWERS OF *P. GRANDIDENTATA*. Bot. Cur. Lit. 13(21): 20.

165.41

Konovalov, N. A. 1960. URAL'SKAJA PIRAMIDAL'NAJA OSINA. [THE URALS FASTIGIATE ASPEN.] Lesn. Z., Arhangel'sk 3 (3): 156-7. 4 refs. [Russ.]

A brief description of the hybrid, produced by crossing *Populus tremula* male with *P. jablokowii* (i.e. *P. tremula* × *P. bolleana*), with notes on its propagation. It is a decorative, frost-resistant tree, of interest for park and street planting.

165.5

Barnes, B.V. 1959. NATURAL VARIATION AND CLONAL DEVELOPMENT OF *POPULUS TREMULOIDES* AND *P. GRANDIDENTATA* IN NORTHERN LOWER MICHIGAN. Abstr. of thesis, in Dissert. Abstr. 20(5): 1511-2. [Univ. Mich.]

165.71

Barnes, B.V. 1961. HYBRID ASPENS IN THE LOWER PENINSULA OF MICHIGAN. Rhodora 63(755): 311-24. 18 refs.

Einspahr, D.W. 1962. EUROPEAN WHITE POPLAR-BIGTOOTH ASPEN HYBRID IN WISCONSIN. J. For. 60(5): 345. 3 refs.

Describes a natural hybrid developed under fairly open conditions on a moist sandy site. Height at 17 years was 70 ft., d.b.h. 13.7 in., sp. gr. 0.389, fibre length 0.96 mm., chromosome number 38. The tree is bisexual. Sprouts propagated from this tree are being studied.

Little, E. L., Jr., Brinkman, K. A., and McComb, A. L. 1957. TWO NATURAL IOWA HYBRID POPLARS. For. Sci. 3(3): 253-62. 16 refs.

McComb, A. L., and Hansen, N. J. 1954. A NATURALLY OCCURRING ASPEN-POPLAR HYBRID. J. For. 52(7): 528-9.

Cites map references in Iowa for two stands of *Populus grandidentata* × *alba* of good form, rapid growth and apparent disease resistance, for one of which a stand and stock table is given (800 trees and 3,500 cu.ft./acre, 3-9 in. diam., 34-74 ft. with m.a.i. of 145 cu. ft. at 24 yrs., 3½ times as fast as oak of same age.

Pauley, S. S. 1956. NATURAL HYBRIDIZATION OF THE ASPEN [: *POPULUS TREMULOIDES* AND *P. GRANDIDENTATA*]. Minn. For. Note No. 47, 2 pp.

176.1

Rouleau E. 1948. TWO NEW NAMES IN *POPULUS* (: *P. BALSAMIFERA* L. "AR. FERNALDIANA NOM. NO". (*P. BALSAMIFERA* "AR. MICH-AUXII HENRY) AND × *P. GILEADENSIS* STAT. ET NOM NO". (*BALSAMIFERA* × *DELTOIDES* "AR. MISSOURIENSIS?"; *P. CANDICANS* SENSU MICHX.) Rhodora 50(597): 233-6.

Vazquez, Gonzalez. 1931. NOTE ON *P. ILLICITANA* IN SPAIN. Bot. Cur. Lit. 13(12): 32.

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Anonymous. 1908. SWAMP COT TONWOOD (*P. HETEROPHYLLA*). U. S. For. Serv. Silv. Leaflet No. 40.

Slabaugh, P.E. 1958. SILVICAL CHARACTERISTICS OF BIGTOOTH ASPEN (*POPULUS GRANDIDENTATA*). U.S. For. Serv. Lake St. For. Exp. Sta., Sta. Pap. No. 63, 16 pp. 50 refs.

181.3

Stoeckeler, J. H. 1948. THE GROWTH OF QUAKING ASPEN AS AFFECTED BY SOIL PROPERTIES AND FIRE. J. For. 46(10):727-37. 17 refs.

181.521

Cavanagh. 1933. ABNORMAL FLOWERS OF *P. GRANDIDENTATA*. Biol. Abstr. 7: 1762.

Einspahr, D.W. 1960. ABNORMAL FLOWERING BEHAVIOR IN ASPEN. Iowa St. Coll. J. Sci. 34(4): 623-30. 15 refs.

Describes and illustrates branched staminate catkins and *hermaphroditism* in *Populus tremuloides*, and late flowering in *P. grandidentata* and *P. tremuloides*.

——— and Joranson, P. N. 1960. LATE FLOWERING IN ASPEN AND ITS RELATION TO NATURALLY OCCURRING HYBRIDS. For. Sci. 6(3): 221-4. 8 refs.

Reports, with illustrations, the flowering of ♂ and ♀ catkins of *P. tremuloides* 10 days later than the rest and providing thereby the necessary time bridge to explain local hybridization with *P. grandidentata*. [See Pauley, 1956, *P. grandidentata* to *P. japono-gigas*, 165.71.]

2 SILVICULTURE

221.1

Reinke, M.E. 1955. MANAGEMENT OF ASPEN. Wis. Conserv. Bull. 20(11): 25-8.

Recommends clear felling for aspen (both *bigtooth* and *trembling* aspen) at maturity, which is reached in Wisconsin stands at ca. 40-50 years. Yields vary from 5 to 25 cords/acre depending on the soil moisture and fire history of the stand.

231 NATURAL REGENERATION

Green, A.W. 1961. PROMOTING THE SPREAD OF BIGTOOTH ASPEN [*POPULUS GRANDIDENTATA*] IN IOWA. U.S. For. Serv. Cent. St. For. Exp. Sta., Sta. Note No. 149, 2 pp.

The size of small *bigtooth* aspen pockets in low-grade hardwood stands can be increased by clear-felling existing aspens and cutting or killing (depending on merchantability) the adjacent hardwoods. After 3 years, this treatment increased aspen sprout and seedling populations on treated areas from 40 to 5,000/acre; disking the areas did not affect the results. Weed competition is usually outstripped.

231.5

DeByle, N. V. 1962. TRACING AND EVALUATING FUNCTIONAL ROOT CONNECTIONS AMONG STEMS WITHIN ASPEN CLONES. Abstr. of thesis, in Dissert. Abstr. 23(1):9-10. [Univ. Mich.]

Farmer, R. E., Jr. 1962. SOME PHYSIOLOGICAL ASPECTS OF ROOT SUCKER INITIATION AND EARLY GROWTH IN *POPULUS TREMULOIDES* AND *P. GRANDIDENTATA*. Abstr. of thesis, in Dissert. Abstr. 23(1): 10. [Univ. Mich.]

——— 1962. ASPEN ROOT SUCKER FORMATION AND APICAL DOMINANCE. For. Sci. 8(4):403-10. 23 refs.

——— 1962. DEPTH AND DIAMETER OF THE PARENT ROOTS OF ASPEN ROOT SUCKERS. Mich. For. No. 23, 4 pp. A study was made on *Populus tremuloides* (a) and *P. grandidentata* (b) root suckers. On the whole, (a) suckered nearer the soil surface and from smaller roots than (b) which occupies the whole A horizon more completely. This difference probably accounts for the advantage of (b) over (a) on shallow dry sites.

Stoeckeler, J. H., and Macon, J. W. 1956. REGENERATION OF ASPEN CUTOVER AREAS IN NORTHERN WISCONSIN. J. For. 54(1): 13-6. 9 refs.

Westell, C.E., Jr. 1961. THE ECOLOGY OF DEER AND ASPEN IN LOWER MICHIGAN. Abstr. of thesis, in Dissert. Abstr. 21(8): 2067-8. [Univ. Mich.]

232.1

Vasquez. 1929. P. ILLICITANA IN SPAIN. Biol. Abstr. 3: 21356.

232.3 1 1.3

Shea, K. R., and Riker, A. J. 1954. BREEDING POPLARS FOR DISEASE RESISTANCE. Abstr. in Phytopathology 44(9): 505.

232.32

Einspahr, D. W. 1959. NURSERY PRODUCTION OF ASPEN SEEDLING. U. S. For. Serv. Tree Plant. Notes No. 35: 22-4. 1 ref. Experiments indicate that seedlings of *Populus tremuloides* and *P. grandidentata* suitable for field planting can be obtained in

one season by sowing in sterilized seedbeds covered with a layer of acid sand; daily watering and screening against rain drops are necessary until early July, when the screens are removed and watering done twice weekly.

232.328.1

Farmer, R.E., Jr. 1963. VEGETATIVE PROPAGATION OF ASPEN BY GREENWOOD CUTTINGS. J. For. 61(5): 385-6. 8 refs.

Negisi, K., Yagi, K., and Satoo, T. 1958. [STUDIES IN THE GROWTH OF YOUNG PLANTS OF POPLAR [POPULUS JAPONO-GIGAS] ARISING FROM CUTTINGS OF DIFFERENT THICKNESS. 1. SEASONAL COURSE IN DRY WEIGHT INCREMENT.] J. Jap. For. Soc. 40(10): 421-37. 3 refs. [Jap.e.e.] Presents extensive graphical data [in English] showing the growth of young *P. japono-gigas* from cuttings of various thicknesses, as observed mainly by their changes in weight in the first season of growth.

[U.S.A.: Cent. St. For. Exp. Sta.] 1959. VEGETATIVE PROPAGATION OF POPLARS. Rep. U.S. For. Serv. Cent. St. For. Exp. Sta. 1958: 33-4.

3 WORK SCIENCE. HARVESTING OF WOOD: LOGGING AND TRANSPORT. FOREST ENGINEERING

322.3

Lohrey, R.E. 1959. DEBARKING BIGTOOTH ASPEN WITH 2,4-D AMINE SALT. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 550, 2 pp. Tests showed that 2,4-D applied weekly at full strength or in a 50% water solution to frill girdles was an effective substitute for Na arsenite, and loosened aspen bark until the end of July. A 25% concentration was effective only during treatments in June.

33 DEGREE OF UTILIZATION AND WASTE

Ralston, R.A. 1953. COMPARISON OF MAN HOURS REQUIRED FOR THINNING AND CLEAR CUTTING POLE-SIZE ASPEN. U.S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 407, 1 p. Results of a time study showing logging time per cord for low thinning (diam. below 7 in.) crown thinning (diam. above 7 in.), and clear felling in a 50-acre block of *Populus grandidentata* averaging 22 cords/acre are tabulated. Figures were 4.0, 3.6, and 3.0 man-hr./cord respectively.

4 FOREST INJURIES AND PROTECTION

443 FUNGI AND BACTERIA

Gruenhagen, R. H. 1945. HYPOXYLON PRUINATUM AND ITS PATHOGENESIS ON POPLAR. Phytopathology 35 (1): 72-89. Bblg.

443.3

Graham, S. A., and Harrison, R. P. 1954. INSECT ATTACKS AND HYPOXYLON INFECTIONS IN ASPEN. J. For. 52(10): 741-3. In ca. 95% of 138 *Hypoxylon pruinatum* cankers on the main stems of *Populus tremuloides* and *P. grandidentata* the original seat of infection was insect damage (*Saperda calcarata* 30%, *Dicerca tenebrica* 15, *Agilus* 15, *Lepidoptera* 14). Silvicultural control is suggested.

Dance, B.W. 1961. SPORE DISPERSAL IN POLLACCIA RADIOSA (LIB.) BALD. AND CIF. Canad. J. Bot. 39(6): 1429-35. 3 refs.

Silverborg, S.B. 1959. RATE OF DECAY IN NORTHERN HARDWOODS FOLLOWING ARTIFICIAL INOCULATION WITH SOME COMMON HEARTROT FUNGI. For. Sci. 5(3): 223-8. 7 refs.

44/45

Harrison, R.P., Jr. 1960. THE INSECTS AND DISEASES OF ASPEN. Abstr. of thesis, in Dissert. Abstr. 20 (12): 4478-9. [Univ. Mich.]

453 INSECTS

Nishiguchi, C. 1958. [ON THE COMMUNITIES OF POPULUS DEFOLIATORS AND THEIR SEASONAL CHANGE.] Bull. Tokyo Univ. For. No. 54: 191-8. 19 refs. [Jap.e.]

A study was made on *Populus japono-gigas* throughout the growing seasons of 1956 and 1957, to analyze the communities of defoliators (in the larval stage) and their seasonal change. The most important defoliators were: *June Malacosoma neustria*, *July Lymantria dispar*, *August Melalopha anastomosis*, *Sept. and Oct. Notodonta tritophus*.

5 FOREST MENSURATION

526.1

Haygreen, J. 1959. DRY WEIGHT OF GREEN ASPEN BOLTS. For. Prod. J. 9(1): 38-42. 13 refs.

541 BASED ON HEIGHT, DIAMETER, VOLUME, ETC.

Graham, S. A., and Harrison, R. P. 1955. SITE IDENTIFICATION FOR BIGTOOTH ASPEN SUCKER STANDS. Mich. For. No. 10, 4 pp.

Tabulates site quality data for *Populus grandidentata* on well-drained sandy soils, expressed as total height at 30 years, which varies from 30 ft. on the poorest to over 90 ft. on the best sites.

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Dode. 1932. NOTES ON GROWTH OF P. ILLICITANA. Biol. Abstr. 6: 22963.

6 FOREST MANAGEMENT

613 EXPLOITABILITY AND ROTATION

Brinkman, K. A., and Krajicek, J. E. 1952. NATURAL MORTALITY AND CULL IN BIGTOOTH ASPEN STANDS IN NORTHEASTERN IOWA. U. S.

For. Serv. Cent. St. For. Exp. Sta., Sta. Note No. 69, 2 pp. A study on 50- and 80-year unmanaged stands of *Populus grandidentata* from 1948 to 1951 showed a rapid decline in the numbers of living and of sound trees per acre from 50 years onwards.

8 FOREST PRODUCTS AND THEIR UTILIZATION

810 GENERAL INFORMATION ON WOOD

Betts, H. S. 1943. AMERICAN WOODS: ASPEN. U. S. For. Serv. 9 pp. Bbig.

81 1.12

Isenberg, I. H. 1956. THE FINE STRUCTURE OF THE CAMBIAL WALL OF BIGTOOTH ASPEN. *Tappi* 39(12): 882-3. 5 refs.

Under the electron microscope, the cambial wall of *Populus grandidentata* showed a random disperse orientation of microfibrils.

813.11

Pearl, I. A. 1957. THE NATURE OF ASPEN LIGNIN. *For. Prod. J.* 7(2): 88-90. 1 ref.

813.14

Thompson, J. O., and Wise, L. E. 1952. SOME MOLECULAR PROPERTIES OF THE HEMICELLULOSES OF BIG TOOTH ASPEN. *Tappi* 35(7): 331-6. 22 refs.

815.3

Inokuma, T., Shimaji, K., and Hamaya, T. 1956. [STUDIES ON POPLARS. (1) MEASUREMENT ON FIBER-LENGTH AND SPECIFIC GRAV-

ITY OF JAPANESE GIANT POPLAR (*POPULUS JAPONO-GIGAS*).] *Misc. Inform. Tokyo Univ. For. No. 11*: 77-86. 7 refs. [Jap.e.e.] The general trend in fibre length (1) with distance from the pith in a 3-year plant agreed with the findings of Sanio (1872) and Amos et al. Length decreased constantly from soil level up. No regular variation in specific gravity was found. Both length and sp. gr. were extrapolated for the 10-year plant for comparison with those of 6 softwoods and 8 hardwoods used in the Japanese pulp industry.

839.9

Anderson, E. A., and Hrubesky, C. E. 1949. UTILIZATION OF FARM WOODLOT WOODS FOR ROOFING FELT. *Rep. U. S. For. Serv. For. Prod. Lab., Madison*, No. R1739, 10 pp.

892.49

Pearl, I. A., and Darling, S. F. 1962. STUDIES ON THE BARKS OF THE FAMILY SALICACEAE. V. GRANDIDENTATIN, A NEW GLUCOSIDE FROM THE BARK OF *POPULUS GRANDIDENTATA*. *J. Organ. Chem.* 27(5): 1806-9. 6 refs.

Justman, O., Beyer, D. L., and others. 1962. STUDIES ON THE BARKS OF THE FAMILY SALICACEAE. I. FURTHER STUDIES ON THE HOT-WATER EXTRACTIVES OF *POPULUS GRANDIDENTATA* BARK. *Tappi* 45(8): 663-6. 10 refs.

P. LASIOCARPA TO P. NIGRA AND VARS.

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

160.29

Gerola, F. M., and Barbesino, M. 1956. RICERCHE SULL'INFLUENZA DELLA POLARITA E DELLA NEOFORMAZIONE DI APICI MERISTEMATICI SULL'ATTIVITA DEIDROGENOSICA DEI TESSUTI CAMBIO-LIBERIANI IN TALLE DI PIOPPO (*POPULUS ITALICA*). [THE EFFECT OF POLARITY AND OF THE FORMATION OF NEW MERISTEMATIC APICES ON DEHYDROGENASE ACTIVITY IN THE CAMBIUM AND PHLOEM OF POPLAR (*P. NIGRA* VAR. *ITALICA*) CUTTINGS.] *Nuovo G. Bot. Ital.* (n.s.) 63(2/3): 213-9. 13 refs. [It.e.]

Segments of branches were placed in sawdust, erect, horizontally, and upside down. Analysis of dehydrogenase activity revealed the presence of definite gradients which appeared to be related to the intrinsic polarity of the branches, the translocation of stimulating substances, and the appearance of meristematic apices. The stimulating action of shoot apices was much more intense than that of the root primordia.

161.2/3

Salageanu, N., and Galan-Fabian, D. 1961. ISSLEDOVANIJA PO PITANIJU OMELY OBYKNOVENNOJ. [INVESTIGATIONS ON THE NUTRITION OF *VISCUM ALBUM*.] *Fiziol. Rast.* 8(5): 547-54. 12 refs. [Russ.russ.e.]

161.4

Swan, H. S. D. 1958. THE INFLUENCE OF GIBBERELLIC ACID ON THE GROWTH AND DEVELOPMENT OF HYBRID POPLAR. *Woodl. Res. Index Pulp Pap. Res. Inst. Can. No. 105*, 20 pp. 5 refs.

161.8

Shapiro, S. 1949. REVERSAL OF POLARITY REGENERATED ROOTS ON STEM CUTTINGS OF *POPULUS*. *Amer. J. Bot.* 36(10): 803.

164.4

Kalbe, L. 1962. [INVESTIGATIONS INTO THE HISTOGENESIS OF THE GROWING POINT OF SHOOTS IN SOME DICOTYLEDONOUS WOODY SPECIES.] *Flora, Jena* 152(2): 279-314. [G.g.] Includes studies of *Populus nigra* var. *italica* and *Ilex aquifolium*.

165.4

Suto, T. 1938. MEIOTIC CHROMOSOMES IN *POPULUS NIGRA* AND *TOISUSUCARDIOPHYLLA*. *Jap. J. Genet.* No. 16: 304-6. *Plant Breed. Abstr.* 14: 1007.

165.41

Jablokov, A. S. 1956. PIRAMIDAL'NYE TOPOLI. [FASTIGIATE POPLARS.] Goslesbumizdat, Moscow & Leningrad. 58 pp. [Russ.] Discusses the importance of fastigate poplars for green-belt and street and roadside planting in the U.S.S.R.; their distribution in cultivation; trials in the breeding of quick-growing, frost-hardy varieties; and propagation.

Li, S.-W. 1960. PRIMENENIE MNOGOKRATNOGO OPYLENIJA v SELEKCIU TOPOLEJ. [REPEATED POLLINATION IN POPLAR BREEDING.] *Vestn. Sel'. -Hoz. Nauki* 5(2): 140-3. 5 refs. [Russ.e.g.f.]

Nicota, B. 1962. [THE IMPROVEMENT OF *POPULUS NIGRA* VAR. *THEVESTINA*.] *Topola, Beograd* 6(28): 50-4. 8 refs. [Serb.f.]

Preliminary experiments indicate that this poplar, which is common in Macedonia, can *easily be crossed* with other black poplars. It is proposed to experiment *further in crosses* with *southern forms of P. deltoides*. Attempted crosses with poplars of *the section Leuce* failed.

Pohl, Z. 1962. [STUDY ON THE GROWTH AND MORPHOLOGY OF THE KORNICK HYBRIDS OF POPULUS MAXIMOWICZII.] Arbor. Kornickie, Poznan '7: 115-87. 35 refs. [Pol.russ.e.e.]

165.5

Marjanovic, P. 1959. SPONTANI HIBRID ILI POSEBNA FORMA DOMACE CRNE TOPOLE. [A SPONTANEOUS HYBRID OR SPECIAL FORM OF THE NATIVE BLACK POPLAR.] Topola, Beograd 3(12):1042-4. [Serb.]

165.51

Kraayenoord, C. W. S. van. 1959. THE CHILEAN OR SEMI-EVERGREEN LOMBARDY POPLAR. Farm For., Wellington 1(4): 88-9. [Cf. F.A. 5, p. 22.] This *variety was introduced into New Zealand from S. Africa in 1948*. Its semi-evergreen *habit* makes it an excellent tree for *shelter purposes*, and cuttings grew 8-10 ft. in 1 year vs. 6 ft. for the *common Lombardy* poplar. It *has so far been* given no *special* botanical name. [Cf. Reinecke and Wicht, 1942, *P. lasiocarpa* to *P. nigra* and vars., 176.1.]

Li, C. -W. 1960. O FORMAH OSOKORJA V BASKIRII. [FORMS OF POPULUS NIGRA IN BASHKIRIA.] Lesn. Hoz. 12(1): 15-8. [Russ.]

165.62

Spalek, V. 1961. SCHWARZPAPPEL - POPULUS NIGRA L. VAR. TYP. CSSR. [P. NIGRA "AR. TYPICA IN CZECHOSLOVAKIA.] Commun. Inst. For. Csl. 2: 81-7. [G.]

A *review of progress to date in the selection of elite individuals in Czechoslovakia and their use in breeding*.

165.7

Cansdale, G. S. 1934. A CRITICAL INVESTIGATION OF THE BLACK POPLARS AND THEIR HYBRIDS AND OF CERTAIN MORPHOLOGICAL CHARACTERS IN THE GENUS. Typscr. 59 pp.

Vill. 1932. P. MONILIFERA AND HYBRIDS DERIVED FROM IT. Mitt. Dtsch. Dendrol. Ges. 44: 66.

165.71

Joachim, H. F. 1958. UBER DIE SPREEWALD-PAPPEL. [THE 'SPREEWALD' POPLAR.] Silvae Genet. 7(1): 25-30. 8 refs. [G.g.e.f.]

Jovanovic, S. 1957. PRIRODNA HIBRIDIZACIJA IZMEDU TOPOLA $\times$ P. MARILANDICA $\times$ P. SEROTINA. [NATURAL HYBRIDIZATION BETWEEN POPULUS $\times$ MARILANDICA AND P. $\times$ SEROTINA.] Topola, Beograd No. 4: 294-7. [Serb.]

Records a case in Yugoslavia of presumed *natural* fertilization of *P. $\times$ marilandica* by *P. $\times$ serotina* (no other male trees existed within a radius of 4-5 km.), and recommends planting *these* varieties in mixture to form a source of hybrid seed for *progeny* trials.

176.1

Anonymous. 1908. FEMALE LOMBARDY POPLAR. Forstwiss. Cbl. May, p. 293.

1919. BLACK POPLAR (P. SEROTINA). Quart. J. For. 13: 137.

1933. NOTE ON P. NIGRA. Mitt. Dtsch. Dendrol. Ges. 45: 342.

Clonar, A., and Ocskay, S. 1955. UN NOU PLOP PIRAMIDAL IN FLORA R.P.R.: POPULUS NIGRA L. "AR. THEVESTINA (DODE, BEAN). [A NEW PYRAMIDAL POPLAR IN THE FLORA OF RUMANIA: P. NIGRA VAR. THEVESTINA.] Bul. Sti. Acad. Repub. Rom. (Sect. Biol.) 7(4): 981-97. 11 refs. [Rum.russ.f.]

This poplar has recently been identified in the South of Rumania, where it is common on poor, sandy soils. All trees appear to be female. Its value as a source of pulpwood is discussed.

Davy, Burtt. 1930. NOTE ON THE LOMBARDY POPLAR. Emp. For. 9: 269.

Dzekov, S. 1959/1960(1960). DOMASNATA CRNA TOPOLA (POPULUS NIGRA L.) VO NR MAKEDONIJA. [THE NATIVE P. NIGRA IN MACE-

DONIA.] God. Zborn. Zemj.-Sum. Fak. Univ. Skopje (Sum.) No. 13: 5-48. 33 refs. [Maced.maced.g.]

A study of *the* taxonomy, morphology, distribution, and ecology of *varieties and forms of P. nigra native to Macedonia*.

1960. ODOMACENA PIRAMIDALNA TOPOLA U NR MAKEDONIJI P. PANNONICA KIT. SYN. P. THEVESTINA DODE, P. THRACIA DODE. [THE FASTIGIATE POPLAR NATURALIZED IN MACEDONIA, POPULUS PANNONICA (= P. NIGRA VAR. THEVESTINA, P. THRACIA).] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 1: 89-126. 14 refs. [Serb.serb.g.]

Fankhauser. 1904. ON THE SWISS POPLAR: P. MONILIFERA. J. For. Suisse 55: 84-9.

He[d]jazi, R., Tabatabai, M., Niloofari [Nilufari], P., and others. 1957. STUDY ON A POPLAR TREE IN IRAN (POPULUS NIGRA "AR. PYRAMIDALIS ROZ.). Bull., For. & Wood Tech. Lab., Univ. Teheran No. 12, 72 pp. 13 refs. [Per.e.e.]

Henry. 1916. THE BLACK POPLARS. Trans. Scot. Arbor. Soc. 30: 14.

Jovanovic, B., and Tucovic, A. 1957. 0 JEDNOJ TOPOLI NOVOJ ZA FLORU JUGOSLAVIJE. [A POPLAR NEW TO THE FLORA OF YUGOSLAVIA.] Sumarstvo 10(3/4): 189-206. 15 refs. [Serb.e.f.] A preliminary account of an apparently new pubescent form of *P. nigra*, of spreading habit, found in the Neretva valley near Capljina.

Lagershausen. 1929. DIFFERENCES BETWEEN P. MONILIFERA AND P. CANADENSIS. Dtsch. Forstztg. 44: 365.

Li, H. -L. 1958. THE WEeping WILLOW AND LOMBARDY POPLAR. Morris Arbor. Bull., Philadelphia 9(1): 3-9. 12 refs.

Discusses their habit, origin, taxonomic position, introduction into various countries, diseases, etc., including, for the poplar, clonal senescence (the evidence for this is not now considered so strong as it appeared to be earlier).

Muller, R. 1961. ALTSTAMMSORTEN DER SCHWARZPAPPELBASTARDE. IIV. NEUSORTEN AUS ALTSTAMMEN "ND FREMDE ALTSORTEN. ['OLD STOCK' VARIETIES OF BLACK POPLAR HYBRIDS. II]. NEW VARIETIES FROM 'OLD STOCKS', AND FOREIGN 'OLD STOCK' VARIETIES.] Holz-Zbl. 87(21): 319-24. 21 refs. [G.]

Rehder. 1928. P. PILOSA FROM E. ALTAI MTS. Biol. Abstr. 2: 13203.

Reinecke, O. S. H., and Wicht, C. L. 1942. A SEMI-EVERGREEN FORM OF LOMBARDY POPLAR. J. S. Afr. For. Ass. No. 9: 19-22. Bblg.

Schwerin. 1907. NOTES ON FEMALE LOMBARDY POPLARS. Mitt. Dtsch. Dendrol. Ges. 16: 288.

Smith, and Taylor. 1908. NOTE ON THE LOMBARDY POPLAR (P. PYRAMIDALIS ROZ.) The Naturalist, July,

Stoyanoff [Stojanov], V., and Entscheff [Encev], E. 1959. POPULUS PRZEWALSKII "ND IHR HOLZ. [P. PRZEWALSKII AND ITS WOOD.] Wissenschaftliche Zeitschrift der Technischen Hochschule Dresden 8(3): 580-4. 8 refs. [G.g.]

Valenzuela, R. H. 1953. EL ALAMO EN CHILE. [POPLAR IN CHILE.] Chile Maderero 3(15): 6. [Span.]

The most widely cultivated poplar in Chile is Populus nigra var. italica. Brief notes are presented on the soils in which it grows, uses of the wood, establishing and tending plantations and yields of timber.

Vasilic, V. 1957. JEDNO OBAVESTENJE 0 T.Z.V. RITISEVSKOJ TOPOLI. [A REPORT ON THE "RITISEVO" POPLAR.] Topola, Beograd No. 4: 298-301. [Serb.]

This variety, existing in both sexes, is said to show better rooting ability and height growth, but a more crooked stem, than P. $\times$ serotina, which it was at first taken to be. No firm data can yet be given on its wood properties, as it has only been grown in nurseries and plantations for 10 years.

Vill. 1936. NOTE ON POPULUS MONILIFERA. Dtsch. Forstzw. 18 (79): 975-76. [G.]

Wolterson, J. F. 1961. POPULUS NIGRA L. IN NEDERLAND. [P. NIGRA IN THE NETHERLANDS.] Ned. Boschb.-Tijdschr. 33(10): 281-

97. 8 refs. [Du.du.e.e.]

Discusses its distribution and uses (e.g. for avenues, boundaries and on sand-dunes) in plantings in the Netherlands, site requirements, identification (in some detail), variability of the material, and the potential value of the collection of clones in the Netherlands for breeding.

Zederbauer. 1908. FEMALE LOMBARDY POPLAR. *Centralbl. f.d.g. Forstw.* 34: 118.

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Holmgren, N. T. 1946. ESTUDIO DEL ALGUNOS DE LOS FACTORES QUE INFLUYEN SOBRE EL CRECIMIENTO DEL ALAMO. [STUDY OF SOME OF THE FACTORS WHICH INFLUENCE THE GROWTH OF POPLAR.] *Agricultura Tec.*, Santiago 6(1): 54-66. [Span.e.]

Jovanovic, B. 1957. O JEDNOJ MALO POZNATOJ TOPOLI (POPULUS THEVESTINA DODE) [A LITTLE-KNOWN POPLAR (P. NIGRA "AR. THEVESTINA).] *Sumarstvo* 10(1/2): 63-70. 16 refs. [Serb.e.f.] Notes on the morphological characters and ecology of this poplar, which is found in S. and S.W. Yugoslavia.

Khoroshikh, P. P. 1948. CHERNY TOPOL' V NARYME. [POPULUS NIGRA IN THE NARYN REGION.] *Priroda* 37(2): 63. 2 refs. [Russ.]

Puri, G. S. 1945. LOMBARDY POPLAR (POPULUS NIGRA VAR. FASTIGIATA DESF.) IN IN DIA. *Indian For.* 71(12): 423-5. Bblg.

Schmitz-Lenders, B. 1953. PAPPELPROBLEME. [POPLAR PROBLEMS.] *Forst u. Holz* 8(2; 3): 13-20; 29-32. [G.]

181.1

Clark. 1931. EXTENSION OF RANGE OF DOWNY POPLAR IN U.S.A. *Bot. Cur. Lit.* 13(17): 31.

Gusev, Ju. D., and Sidorov, L. F. 1960. KEKOLOGII POPULUS PAMIRICA KOM. NA VERHNEM PREDELE EGO PROIZRASTANIJA. [ECOLOGICAL OF P. PAMIRICA AT THE UPPER LIMIT OF ITS RANGE.] *Bot. Z.* 45(3): 444-5. 2 refs. [Russ.]

181.2

Kriebel, H. B., Lowry, G. L., and Murphey, W. K. 1958. RELATIONSHIP OF SITE CONDITIONS TO ESTABLISHMENT AND EARLY GROWTH OF MCKEE HYBRID POPLAR. *Res. Circ. Ohio Agric. Exp. Sta. No.* 53, 11 pp.

181.31

Takato, I. and Toyooka, H. 1953. [THE RELATIONS BETWEEN GROWTH OF JAPANESE BIRCH AND DORO POPLAR AND THE HEIGHT OF THE GROUND WATER.] In *Symp., Ann. Staff Conf., Sapporo Br., Govt. For. Exp. Sta.*, 1952: 85-102. [Jap.jap.e.]

Discusses the effect on height and root growth of *Betula tauschii* and *Populus marimowiczii* growing on forest loam, peat and mixed soils, of different heights of underground water. [From authors' summary.]

181.311

Schmitz-Lenders, B. 1959. REAKTION DER PAPPEL AUF GRUNDWASSER-ABSENKUNG UND NEUE ERKENNTNISSE BETREFFEND DEN ZUWACHSGANG IN HARFFER-PAPPEL—WEITVERBAND-BESTANDEN DES NIEDERRHEIN-GEbietes. [THE REACTION OF POPLARS TO A LOWERING OF THE WATER TABLE, AND NEW LIGHT ON THE COURSE OF INCREMENT IN WIDELY SPACED STANDS OF THE HARFF POPLAR [POPULUS X REGENERATA] IN THE LOWER RHINE REGION.] *Allg. Forst- u. Jagdztg.* 130(7): 201-4. 2 refs. [G.]

1961. REGENERATION IM ZUWACHSDURCHGRUNDWASSER-ABSENKUNG GESCHADIGTER HARFFER PAPPELN. [RECOVERY OF INCREMENT OF "HARFF" POPLARS INJURED BY A LOWERING OF THE WATER TABLE.] *Allg. Forst- u. Jagdztg.* 132(4): 102-4. 2 refs. [G.e.]

Re-examination of the trial plots showed a recovery particularly in height and volume increment, in the last 3 years, though not quite to the former level, and confirmed the previous yield forecasts.

181.35/36

Truszkowska, W. 1961. ORIENTACYJNE BADANIA MIKROFLORY NAJMIODSZYCH CZĘŚCI SYSTEMU KORZENIOWEGO TOPOL (POPULUS EURAMERICANA MARILANDICA BOSCO) Z ROZNYCH STANOWISK W TURWI.

[A MYCOLOGICAL STUDY OF ROOTLETS AND YOUNG ROOTS OF P. X CANADENSIS VAR. MARILANDICA FROM DIFFERENT SITES AT TUREW (NEAR POZNAN).] *Acta Soc. Bot. Polon.* 30(3/4): 395-421. 22 refs. [Pol.pol.f.]

181.36

Shapiro, S. 1955. LIGHT INHIBITION OF ROOTS ON STEM SEGMENTS OF THE LOMBARDY POPLAR. *Abstr. in Plant Physiol.* 30(Suppl.): 8-9.

181.52

Kobendza, R. 1955. OKAZY ZENSKIE TOPOLI PIRAMIDALNEJ W POLSCE. [FEMALE SPECIMENS OF POPULUS NIGRA VAR. ITALICA IN POLAND.] *Roczn. Dendrol. Polsk. Tow. Bot., Warsz.* 10: 191-207. 19 refs. [Pol.russ.e.]

Describes specimens found in Warsaw and environs. They are of two types: (1) with a narrow pyramidal crown reaching the base of the stem, and (2) with a much broader, more open crown which begins at a certain height above ground level. The latter might be of hybrid origin.

181.521

Jovanovic, B., and Tukovic, A. 1962. [AN UNUSUAL OCCURRENCE OF MONOECISM IN POPULUS NIGRA L.] *Topola, Beograd* 6(28): 46-50. 7 refs. [Serb.g.]

Gives an account of a tree consisting of three stems of coppice origin, two of which bear catkins only, while the tallest, middle stem bears ♀, ♂ and ♀.

Nicota, B. 1961. POJAVA DVOPOLNIH CVETOVA KOD P. THEVESTINA DODE. [THE OCCURRENCE OF BISEXUAL FLOWERS IN POPULUS NIGRA VAR. THEVESTINA.] *Topola, Beograd* 5(22/23): 17-8. 7 refs. [Serb.f.]

Describes the three trees in Macedonia (aged 25-32) on which the flowers were found, with some phenological data, and discusses the significance of the find for breeding. [Cf. May, 1959, P. deltoides to P. generosa, 181.521.]

181.525

Ustanov, A. U. 1961. K BIOLOGII PRORASTANIJA SEMJAN SIZOGO TOPOLJA PETTY (POPULUS PRUNOSASCHRENK.). [BIOLOGY OF GERMINATION IN SEEDS OF P. PRUNOSA.] *Dokl. Akad. Nauk Uzbekskoj SSR, Taskent* 1961(4): 54-6. [Russ.uzb.]

Briefly reports data on laboratory germination, distinguishing (by color) eight kinds of seed, as well as germination in pots outdoors. In nature, many of the seeds fall into rivers; the seeds can live in water for 15-20 days, where they begin to germinate.

181.61

Milovanovic, M. 1957. JEDNA ZALOSNA CRNA TOPOLA NA OMO-LICKOM FORLANDU. [A WEEPING SLACK POPLAR AT OMOLICKO FORLAND.] *Topola, Beograd* No. 3: 205-9. [Serb.f.] Describes, with a photograph, a specimen of P. nigra f. pendula, situated on the banks of the Danube, near Pancevo. It has a height of 14 m. and a d.b.h. of 112 cm. and has grown from a stump cut ca. 40 years ago. Morphological data are given. Attempts at vegetative propagation are being made.

181.71

Anonymous. 1925. A FINE LOMBARDY POPLAR. *Timb. Tr. J.* 1: 62.

Florian-Larsen, P. C., and Lange, J. 1955. "STOREPIL" PA HERLUFSSHOLM: EN BEROMT SORT POPPEL, POPULUS NIGRA L. [THE "STOREPIL" AT HERLUFSSHOLM: A FAMOUS SPECIMEN OF P. NIGRA.] *Dansk Dendrol. Arsskr.* 3: 270-5. 7 refs. [Dan.]

Notes on a veteran tree which fell in the storm of Jan. 20, 1954, aged between 265 and 270 years. In its prime (1824-46) its height was ca. 40 m.; in 1900 its diameter at 2 m. was 25-1/2 Danish ft. [1 Danish ft. = ca. 0.314 m.]; and after that date it was only kept standing by special repairs and lopping.

181.75

Herrmann, S., and Meyer, H. 1959. ZUR FRAGE DER "KLONALTE-RUNG" BEI PYRAMIDEN-PAPPELN. [THE PROBLEM OF "SENESCENCE OF CLONES" IN POPULUS NIGRA VAR. ITALICA.] *Allg. Forstzeitschr.* 14(9): 196-8. 16 refs. [G.]

181.8

Gerola, F. M., and Barbesino, M. 1956. L'ATTIVITA' DEIDROGENASICA DEL CAMBIO IN DIFFERENTI PERIODI DELL'ANNO IN CORYLUS, POPULUS E PRUNUS. [THE DEHYDROGENASE ACTIVITY OF THE CAMBIUM AT DIFFERENT SEASONS OF THE YEAR IN CORYLUS, POPULUS, AND PRUNUS.] *Nuovo G. Bot. Ital.* (n.s.) 63(1): 37-45. 37 refs. [It. it. e.] Using a *tetrazolium* staining technique, seasonal changes in *dehydrogenase* activity were determined in *the* cambium and *phloem* of branches of *C. avellana*, *Populus nigra* *var. italica*, and *Prunus avium*. Maximum activity occurred in spring and autumn, coinciding with maximum *cambial* cell activity and maximum accumulation of reserves respectively. A gradient of activity was found along the branch, reaching a *maximum at the* apex.

2 SILVICULTURE

Alviella, G. d'. 1947. LA CULTURE DU PEUPLIER. [THE CULTIVATION OF THE POPLAR.] *Bull. Soc. For. Belg.* 54(3/4): 97-128. [F.]

Georgiev, Z. 1945. VURHU PRIRASTANA TOPOLOVITE, VURBOVITE I DUBOVITE NASAZDENIJA V DUNAVSKITE OSTROVI "BELENE" I "VARDIM." [GROWTH OF POPLAR, WILLOW AND OAK STANDS ON THE DANUBIAN ISLANDS OF BELENE AND VARDIM.] *Gorsko Stopanstvo* 1(1/2): 22-4. [Bulg.]

Soljanik, I. 1960. BELI JABLAN (POPULUS THEVESTINA DODE) U USLOVIMA AKMO. [P. NIGRA "AR. THEVESTINA IN THE CONDITIONS OF KOSOVO-METOHJA.] *Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu* No. 2: 69-82. 23 refs. [Serb. f.]

This poplar *has* probably been used more than any other for planting in the *region*, chiefly in *shelterbelts*. Brief data on distribution, future planting programs, timber production, *price*, *etc.*, *are given*.

228.7

Matsui, Z. 1955. -[SILVICULTURAL STUDIES OF DORO-POPLAR [P. MAXIMOWICZII] IN HOKKAIDO.] *Res. Bull. Exp. For. Hokkaido Univ.* 17(2): 665-714. 15 refs. [Jap. e.]

23 REGENERATION AND FORMATION OF STANDS

Schwerin. 1931. REGENERATION OF P. LASIOCARPA. *Mitt. Dtsch. Dendrol. Ges.* 43: 406.

231 NATURAL REGENERATION

Popelka. 1930. REGENERATIVE ACTIVITY OF P. PYRAMIDALIS. *Biol. Abstr.* 4: 7373.

232 ARTIFICIAL REGENERATION

Sevcenko, S. V. 1961. VYRASCIVANIE OSOKORJADLJAFANERNOGO PROIZVODSTVA. [GROWING POPULUS NIGRA FOR VENEER.] *Lesn. Hoz.* 14(11): 28-30. [Russ.]

Discusses the ecological requirements and rate of growth of burred forms of *P. nigra* in the *Trans-Carpathian* region, and also *the* possibilities of establishing plantations *in order* to increase *the supply of* burr material for furniture veneers.

232.1

Gerock. 1929. THE LOMBARDY POPLAR IN ALSACE. *Biol. Abstr.* 3: 3010.

Hermes. 1930. P. MONILIFERA IN GERMAN Y. *Mitt. Dtsch. Dendrol. Ges.* 42: 383.

Safar, J. 1962. PROBLEM PROIZVODNOSTI KULTURA CRNOG BORA U SUBMEDITERANSKOJ ZONI. [THE PROBLEM OF PRODUCTIVITY OF PINUS NIGRA "AR. AUSTRIACA PLANTATIONS IN THE SUBMEDITERRANEAN ZONE.] *Sum. List* 86(1/2): 32-40. [Croat. f.]

232.1 1

Cozzo, D. 1959. EL CRECIMIENTO DEL ALAMO NEGRO (POPULUS NIGRA CV. "ITALICA") EN ALTO VALLE DEL RIO COLORADO Y DEL RIO LIMAY, ARGENTINA. [GROWTH OF P. NIGRA "AR. ITALICA IN THE UPPER REACHES OF THE RIVERS COLORADO AND LIMAY, ARGENTINA.] *Rev. For. Argent.* 3(3): 88-100. [Span.]

Hacskeylo, J., and Murphey, W. K. 1958. GROWTH SUBSTANCES. RESPONSE OF 0-YEAR-OLD MCKEE HYBRID POPLAR TO GIBBERELLIC ACID. *Res. Circ. Ohio Agric. Exp. Sta. No. 54*, 8 pp. 3 refs.

Tucovic, A. 1954. PRILOG POZNAVANJU CRNIH TOPOLA U BEOGRADU I OKOLINI. [POPULUS NIGRA IN BELGRADE AND ITS VICINITY.] *Sumarstvo* 7(11112): 638-49. 14 refs. [Serb. e. g.]

Some tabulated *phenological* data (flowering, flushing, *leaf-fall*, and fruiting) are given for *the local Populus nigra*, *P. nigra* *var. pyramidalis*, *the same* with female catkins, *P. nigra* *var. betulifolia*, and *P. nigra* *var. plantierensis*.

Walter. 1931. P. NIGRA LEAVES REMAINING GREEN UNTIL CHRISTMAS. *Mitt. Dtsch. Dendrol. Ges.* 43: 420.

232.13

Bugala, W., and Stecki, Z. 1961. MIESZANCE POPULUS MAXIMOWICZII HENRY I DOTYCHCZASOWE WYNIKI ICH UPRAWY W KORNIKU. [P. MAXIMOWICZII HYBRIDS, AND RESULTS OF THEIR CULTIVATION IN KORNIK.] *Arbor. Kornickie, Poznan* 6: 93-116. 15 refs. [Pol. e. e. russ.]

Eschner, A. R. 1960. OBSERVATIONS ON A HYBRID POPLAR TEST PLANTING IN WEST VIRGINIA. *U.S. For. Serv. Northeast. For. Exp. Sta. Res. Note No. 111*, 4 pp. 1 ref.

Of the 50 clones used on two *sites* (*data on* parentage and growth tabulated), 7 can be recommended for planting in a *similar climate on* soils of low pH in W. Virginia. *All are* hybrids of *P. maximowiczii*, and maintained an annual height increment of ≥ 3.6 ft. for 9 years on a well-drained site. *The largest single tree was of clone* NE-50 (*P. maximowiczii* $\times$ *P. berolinensis*) with a height of 50 ft. and diameter of 6.1 in. after 9 growing seasons.

232.328

Gumpelmayer, E. 1949. DIE BEWURZELUNG VON STECKLINGEN UNTER DEM EINFLUSS VON HETEROAUXIN IN JAHRESRHYTHMUS. [ROOTING OF CUTTINGS IN THE SEASONAL RHYTHM UNDER THE INFLUENCE OF HETEROAUXIN.] *Phyton, Horn* 1(2/4): 154-69. 30 refs. [G. g.]

232.328.1

Biolcev, A. 1956. KACESTVA NA LETORASTITE ZA REZNICI OT KANADSKA I PYRAMIDALNA TOPOLA V ZAVISIMOST OT GASTOTATA NA PENCETATE-MAJKI. [THE QUALITY OF SHOOTS FOR CUTTINGS OF POPULUS X 'CANADENSIS' AND P. NIGRA "AR. ITALICA IN RELATION TO THE SPACING OF THE PARENT STOOLS.] *Nauc. Trud. Lesotekh. Inst., Sofia* No. 4: 87-99. 4 refs. [Bulg. russ.]

The optimum stool spacing, for producing shoots 15-18 cm. long and 7-10 mm. thick, was 60-70 cm. for *P. canadensis*, and 50 cm. for *P. nigra* *var. italica*.

Ishizaki, A. 1951. [ROOTING AND GROWTH OF CUTTINGS OF DORONOKI (POPULUS MAXIMOWICZII HENRY) IN RELATION TO CUTTING MEDIA.] *J. Jap. For. Soc.* 33(10): 325-9. [Jap. jap. e.]

Rooting *percent after* 84 days was best on volcanic ash soil, then on peat and sand, peat and loam, loam, clay and sand, in that order. *Greatest root growth* occurred in *peat and sand*.

Kakesita. 1930. REGENERATION OF P. NIGRA BY STEM CUTTINGS. *Bot. Cur. Lit.* 12: 5.

Ogasawara, K. 1956. [STUDIES ON THE CUTTINGS OF FOREST TREES. (I), THE RELATIONSHIP BETWEEN THE ROOTING BEHAVIOUR AND THE REGION OF THE TREE FROM WHICH CUTTINGS WERE COLLECTED.] *J. Jap. For. Soc.* 38(8): 297-300. 8 refs. [Jap. jap. e.]

Shapiro, S. 1957. AUXIN CONTROL OF SEASONAL POLARIZATION OF ROOT EMERGENCE. *Abstr. in Plant Physiol.* 32(Suppl.): xlii.

Shidei, T., and Ogasawara, K. 1957. [STUDIES ON THE CUTTINGS OF FOREST TREES (II), THE EFFECT OF THE HORMONE TREATMENT ON THE ROOTING BEHAVIOUR OF THE CUTTINGS OF POPLAR (P. NIGRA VAR. ITALICA).] *J. Jap. For. Soc.* 39(4): 124-7. 13 refs. [Jap. jap. e.]

——— and Ogasawara, K. 1957. [STUDIES ON THE CUTTINGS OF FOREST TREES (V), INFLUENCE OF AMOUNT OF LEAF, HORMONE

TREATMENT AND THEIR INTERACTION UPON THE ROOTING BEHAVIOUR OF POPLAR (POPULUS NIGRA VAR. ITALICA) CUTTINGS.] J. Jap. For. Soc. 39(8) : 298-302. 4 refs. [Jap.jap.e.e.]

——— and Ogasawara, K. 1957. [STUDIES ON CUTTINGS OF FOREST TREES (VII). THE EFFECTS OF EXISTENCE OF BUDS AND HORMONE TREATMENT ON THE ROOTING BEHAVIOUR OF POPLAR (POPULUS NIGRA VAR. ITALICA) CUTTINGS.] J. Jap. For. Soc. 39(10) : 389-92. 5 refs. [Jap.jap.e.e.]

Sonnenfeld, M. 1961. [THE BEST TIME FOR PROPAGATING SEVERAL TREES *ND SHRUBS FROM CUTTINGS.] Acta Agrobotanica, Warsz. 10(2) : 35-45. 4 refs. [Pol.pole.]

Tomza, B. 1959. WPLYW GRUBOSCI I DŁUGOSCI ZRZEW TOPOLOWYCH NA WZROST SADZONEK W PIERWSZYM ROKU. [THE INFLUENCE OF DIAMETER *ND LENGTH OF POPLAR CUTTINGS ON THE FIRST-YEAR INCREMENT.] Zesz. Nauk. Szkol. Gospod. Wiejsk. Warsz. (Lesn.) No. 2: 121-37. 16 refs. [Pol.g.russ.]

232.328.1/2

Floor, J. 1952. PROEVEN MET VERMEERDERING DOOR ENTSTEKKEN. [TRIALS OF PROPAGATING BY "X CUTTINGS" [CUTTINGS ASSISTED IN THE ROOTING PERIOD BY SIDE-GRAFTING TO CUTTINGS OF EASY ROOTERS].] Meded., Inst. Veredeling Tuinbouwgewassen, Wageningen No. 40, 26 pp. 11 refs. [Due.]

232.328.2

Hudson, J.P. 1955. PROPAGATION OF PLANTS BY ROOT CUTTINGS II. SEASONAL FLUCTUATION OF CAPACITY TO REGENERATE FROM ROOTS. J. Hort. Sci., Lond. 30 (4) : 242-51. 13 refs. (Misc. Pub., Dep. Hort., Sutton Bonnington No. 9.) Batches of cuttings were made at regular *intervals over a period of a year, and* cuttings from *each* batch planted in several *different environments*. The only woody species tested, *Populus nigra*, showed a seasonal variation in capacity to regenerate from root cuttings, this being greatest in winter.

232.43

Palotas, F. 1963. [DATA FOR MODERN TENDING OF POPLAR STANDS.] Erdo 12 (4) : 150-5. 2 refs. [Hu.russ.g.] *Among controlling factors, the* forester's most potent influence *is* through manipulation of stem number. *Close- and* open-stock-ing regimes of *Populus* × *marilandica* are compared in detail. *The* timing, *interval* and intensity of thinnings are delicate questions in these fast-growing stands. Close planting and subsequent regulation of stem number *in* consonance with *the* objects of management are advocated.

232.5

Costin, E. 1959. FIXAREA SI VALORIFICAREA DUNELOR NISIPOASE PRIN PROCEDEUL BUTASILOR PLANTATI ADINC. [THE FIXATION *ND PRODUCTIVE USE OF SANDS BY DEEP PLANTING OF CUTTINGS.] Rev. Padurilor 74(1) : 23-6. [Rum.russ.g.f.e.] *It was* found that cuttings of *Populus nigra* var. *the vestina* 1.5 m. long, planted vertically so as to *be* completely covered *by sand*, *gave* 85.4% survival at *the end of the second year when all other*

types of planting (both cuttings and seedlings, with and without the addition of humus) had failed completely.

233 AFFORESTATION

Babenko, D.K. 1957. ISPOL'ZOVANIE OSOKORJA NA TERSKO-KUM-SKIH PESKAKH. [THE USE OF POPULUS NIGRA ON THE TEREK-KUM SANDS.] Lesn. Hoz. 10(3) : 28-30. [Russ.]

Tabulates data on height, diameter and volume increment of the poplar plantations, some of which are 42 *years* old, in the sandy *areas to the west of the Caspian*.

Lohr, T. 1951. ZUM THEM*: AUFFORSTUNG VON ANSCHUTTUNGS-BODEN. [THE AFFORESTATION OF SPOIL MOUNDS.] Forst. u. Holz 6(19) : 279-81. 14 refs. [G.]

235 UNDERPLANTING, ADVANCE PLANTINGS, ETC. NURSES AND FORMATION OF MIXTURES

Borsos, Z. 1957. FAALLOMANY-SZERKEZETI VIZSGALATOK A VASI HEGYHATON. [STAND STRUCTURE INVESTIGATIONS IN THE HILLY REGION "HEGYHAT" OF VAS COUNTY.] Erdo 6(2) : 41-51. [Hu.] From abstr. in Hung. Agric. Rev. 6(3) : 1. 1957 [G.] Recommends *underplanting pure poplar stands (e.g. P. × marilandica)* with hornbeam *and* regenerating *them naturally*. *Oaks, if many in the upper story, should be reduced to* allow entry of hornbeam, *thus encouraging also the value and* volume increment and natural *regeneration* of the oaks. Where valuable stems are few, they should *be reserve-marked at the first* thinning or *else at 45-55 years*.

237.4

Rigaud, A. 1952. UN BIOLOGISTE POITEVIN OBTIENT GRACE AUX BACTERIES DES RENDEMENTS RECORDS. [A POITEVIN BIOLOGIST OBTAINS RECORD CROPS, THANKS TO BACTERIA.] For. France No. 36: 11. [F.]

238 TIMBER PLANTATION CROPS REQUIRING SPECIAL TREATMENT

Ernesto Alonzo, A. 1951/52. PROVISION DE MADERA PARA ENVASES - CULTIVO DEL ALAMO EN RIO NEGRO. [SUPPLYING TIMBER FOR PACKING CASES IN THE CULTIVATION OF POPLAR IN THE RIO NEGRO TERRITORY.] Alm. Minist. Agric. Argent. 26/27 : 169-74. [Span.]

Geschwind, G. 1955. ASVANYRARO KORNYEKI NYARASOK APOLASA. [TENDING OF POPLAR STANDS IN THE AREA OF ASVANYRARO.] Erdo 4(5) : 191-6. [Hu.] *Describes* large-scale plantings of *Populus* × *marilandica* begun in 1920 and now giving *large* intermediate and valuable final yields. *Areas* are clear-felled and planted *with 2-m. saplings at* 2 × 2 m. for final espacement of 5 × 5 or 6 × 6 m. *at a* rotation age of 25-30 years. *Thinnings are made every 2-3 years. From abstr. in Hung. Agric. Rev. 4(3) : 7. 1955.*

242 THINNINGS

Koltay, G. 1955. A NYAR-ES EGYEB ALLOMANYOK APOLASA. [TENDING STANDS OF POPLAR AND OTHER SPECIES.] Erdesz. Kutatas., Budapest 1955(1) : 3-16. [Hu.russ.g.]

3 WORK SCIENCE. HARVESTING OF WOOD: LOGGING AND TRANSPORT. FOREST ENGINEERING

378.44

Butyrskii, Ju. N. 1954. SPLAV LISTVENNOGO LESA BEZ HVOINOGO PODPLAVA. [FLOATING OF BROADLEAVED-SPECIES TIMBER WITHOUT CONIFEROUS FLOATS.] Lesn. Prom. 14(10) : 29-30. [Russ.]

Populus nigra and *Salix alba* were floated in 1954 *in large quantities on the Volga over* a distance of *ca. 1,500* km. without using softwood floats. *The* buoyancy of bundles made of these species is the greater the longer *the* logs, and *the* higher the proportion of *large* diameters, *the* basic *condition* being the presence of bark.

4 FOREST INJURIES AND PROTECTION

Schwerin. 1902. CAUSES OF DYING OFF OF LOMBARDY POPLARS. Mitt. Dtsch. Dendrol. Ges. 11: 442.

416.13

Dunn, J. A. 1960. THE FORMATION OF GALLS BY SOME SPECIES OF PEMPHIGUS (HOMOPTERA:APHIDIDAE). Marcellia, Napoli 30 (Suppl., publ. in Strasbourg): 155-67. 7 refs. We.1

Describes the method whereby the fundatrices of some *Pemphigus* species (*P. bursarius*, *P. protospirae*, *P. spirothacae*, *P. filiginis*, and *P. phenax*) form their galls on *Populus nigra* var. *italica*.

Gomez-Menor Guerrero, J. M. 1957. BIOCENOSIS EN LAS AGALLAS DEL CHOPO. [BIOCOENOSIS IN POPLAR GALLS.] Graellsia, Madrid 15: 175-86. 19 refs. [Span.]

Presents notes on (1) *Pemphigus spirotheca*, producer of galls on leaves of *Populus pyramidalis*, and on three of its predators, and (2) *Lepidosaphes ulmi* and a parasite.

Kloft, W. 1960. BEOBACHTUNGEN ZUM ZEITLICHEN VERLAUF DES ABWURFS VERGALTETER UND NORMALER PAPPELBLÄTTER. [THE TIME-SEQUENCE OF LEAF SHEDDING OF NORMAL AND GALLED POPLAR LEAVES.] Marcellia, Napoli 30 (Suppl., publ. in Strasbourg): 125-6. 3 refs. [G.]

Leaves from under a *Populus nigra* var. *italica* were counted on an area of 2 sq. m. from 19 Oct. to 27 Oct. Of 370 leaves having *Pemphigus bursarius* galls, 213 dropped in the first, 141 in the second, and 16 in the last third of the period, whereas the sequence for healthy leaves was 203, 756, 450.

416.4/5

Maciejewska-Potapczykowa, W., and Niedzielski, A. 1962. ZAWARTOSC ZWIĄZKÓW AZOTU W TKANKACH ZDROWYCH I TUMORACH NIEKTORYCH ROSLIN. [N COMPOUNDS IN HEALTHY AND CANCERED TISSUE OF SOME PLANTS.] Acta Soc. Bot. Polon. 31(1):95-101. 26 refs. [Pol. pol. e.]

The N fractions in cankered tissue of *Datura stramonium*, *Populus nigra* and *Quercus robur* were considerably higher than in healthy ones; but in crown gall tumors of oak, they were significantly lower than in the leaves. [From authors' summary.]

416.5

Rafes, P. M. 1955. ROL' OSINOVOJ STEKLJANNICY I TOPOLEVOJ PJATNISTOJ ZLATKI V GIBELI OSOKOREJ V ACIKULAKSKOM LESHOCHE. [THE ROLE OF SCIAPTERONTABANIFORMIS AND MELANOPHILAPICTA IN THE MORTALITY OF POPULUS NIGRA ON THE ACHIKULAKLESKHOZ.] Soobsc. Inst. Les. No. 5: 84-95. 22 refs. [Russ.]

Observations in the steppe between the Terek and Kuma Rivers [Pre-Caspian lowland] indicated that the drop in the water table is the principal cause of the heavy poplar mortality.

1956. ROL' OSINOVOJ STEKLJANNICY I TOPOLEVOJ PJATNISTOJ ZLATKI V GIBELI OSOKOREJ V ACIKULAKSKOM LESHOCHE. [THE ROLE OF SCIAPTERON TABANIFORMIS AND MELANOPHILA PICTA IN POPULUS NIGRA MORTALITY ON THE ACHIKULAK LESKHOZ.] Soobsc. Inst. Les. No. 6: 62-78. 17 refs. [Russ.]

A second report giving further details on the degree of infestation and the type of injury to poplar stands in 1953 and 1954.

425.2

Karschon, R. 1962. [SEA WINDS AS SITE FACTORS.] Schweiz. Z. Forstw. 113(12): 687-91, 736. 3 refs. [G.f.]

Briefly discusses research in Israel on leaf necroses (accompanied by a great rise of Cl content in eucalypts and of Na in *Populus nigra* cv. 'Chile'), on soil effects, particularly under and, less so, to the lee of tree rows, and on windbreaks.

442.1

Kummerow, J., and Matte, V. 1960. ANATOMISCHE BEOBACHTUNGEN AN PHRYGILANTHUS TETRANDRUS (RUIZ ET PAV.) EICHL., EINER SEMIPARASITISCHEN LORANTHACEE. [ANATOMICAL STUDIES ON P. TETRANDRUS, A SEMI-PARASITIC MEMBER OF THE LORANTHACEAE.] Phytopath. Z. 39(4): 321-6. 7 refs. [G.g. span.]

Describes and illustrates with photomicrographs anatomical aspects of the attack by *P. tetrandrus* on *Populus nigra* var. *italica*.

443 FUNGI AND BACTERIA

Chorin, M. 1939. CYTOSPORA CHRYSOSPERMA ON POPULUS NIGRA. Palest. J. Bot., R. Ser. 2: 251-88. Rev. Appl. Mycol. 19: 171. 1940.

[Day, W. R.] 1948. [FROST INJURY AND BACTERIAL CANCER OF POPLAR.] Rep. Imp. For. Inst., Oxf. 1946-7: 12.

Minz, G. 1942. BEES GATHER RUST SPORES OF MELAMPSORA POPULINAKLEB. Hassadeh 22(6): 173. [Heb.] Rev. Appl. Mycol. 23: 366. 1944.

Truszkowska, W. 1957. OBSERWACJE NIEKTORYCH GRZYBOW PASOZYTNICZYCH I SAPROFITYCZNYCH NA PEDACH POPULUS EURAMERICAN. 4 MARILANDICA BOSC. W TURWI (WOJ. POZNANSKIE). [SOME PARASITIC AND SAPROPHYTIC FUNGI ON YOUNG P. X MARILANDICA AT TUREW NEAR POZNAN.] Acta Soc. Bot. Polon. 26(2): 257-69. 13 refs. [Pol. pol. f.]

443.2

Castellani, E., and Cellerino, G. P. 1961. SU UNA ERYSIPE PARASSITA DEL PIOPO. [AN ERYSIPE AS A PARASITE ON POPLARS.] Riv. Patologia Vegetale, Pavla (Ser. 3) 1(3): 298-304. 11 refs. [It. it. e.]

443.3

Demetriades, S. D. 1950. LA ROUILLE DU PEUPLIER EN GRECE. [POPLAR RUST IN GREECE.] Ann. Inst. Phytopathologique Benaki, Athens 4(112): 50-2. 7 refs. [F.]

Records for the first time in Greece the occurrence of *Melampsora allii-populina* on *Populus nigra*.

Kesselhuth. 1953. DER PAPPELKREBS UND SEINE FOLGEN. [POPLAR CANCER AND ITS CONSEQUENCES.] Forst u. Holz 8(1): 2.4. [G.]

Describes an attack by *Valsasordida* on 20-year-old *Populus regenerata* in Germany. *P. robusta* growing on the same site was unaffected.

Sinadskii, Ju. V., and Bondarceva, M. A. 1956. MALOIZVESTNYE TRUTOVIKI NA POPULUS I TAMARIX I IH ZNACENIE V KARA-KALPAKSKOI ASSR. [LITTLE KNOWN SPECIES OF INONOTUS ON POPLARS AND TAMARISK, AND THEIR SIGNIFICANCE IN THE KARA-KALPAK ASSR.] Bot. Z. 41(8): 1177-83. 3 refs. [Russ.]

Vlasov, A. A., and Krangauz, R. A. 1958. BOLEZNI BELOJ AKACII, DUBA I TOPOLJA V NASAZDENIJAH ACIKULAKSKOG LESHOCHE. [DISEASES OF ROBINIA PSEUDOACACIA, QUERCUS ROBUR AND POPULUS NIGRA IN STANDS IN THE ACHIKULAK LESKHOZ [CIS-CASPIAN LOWLAND].] Sborn. Rabot Lesn. Hoz. Vsesojuz. Nauc.-Issled. Inst. Lesovod. No. 35: 239-54. 1 ref. [Russ.]

451.2

Wuttky, K. 1959. UNGEWOHNLICHE MAUSESCHADEN AN PAPPELN. [UNUSUAL DAMAGE TO POPLARS BY MICE.] Forst u. Jagd 9(4): 184-5. [G.]

Describes and illustrates crown deformations in a 14-year stand of *Populus x marilandica* attributed to the feeding of mice which were observed to climb into the trees for safety during a severe flood when the poplars were 8 years old and 8 m. high. The species responsible were not ascertained.

453 INSECTS

Bleton, C. A., and Fieuzet, L. 1943. LES PARASITES DU PEUPLIER AU MAROC. 3RD NOTE. SUR LA BIOLOGIE DE SARROTHRIPUS REVAYANA SCOP. (LEPIDOPTERA CYMBIDAE.) [THE PARASITES OF POPLAR IN MOROCCO. 3RD NOTE. ON THE BIOLOGY OF SARROTHRIPUS REVAYANA SCOP. (LEPIDOPTERA CYMBIDAE.)] Bull. Soc. Sci. Nat. Maroc. No. 20: 99-102. Rev. Appl. Ent. 32A: 232.

Sinadskij, Ju. V. 1961. O MOZOLEVIDNYH GALLAHNATURANGE SIZOJ. [THE CALLUS-LIKE GALLS ON POPULUS PRUINOSA.] Ent. Obozr., Moskva 40(2): 297-9. [Russ.]

Describes the galls and their causal agent, *Egeirotria* sp., with notes on its biology.

5 FOREST MENSURATION

Dissescu, G. 1956. ATAC DE AGROMYZA CARBONARIA ZETT, PE POPULUS MARILANDICA. [ATTACK BY A. CARBONARIA ON P. X MARILANDICA.] Rev. Padurilor 1956(1): 59-60. 2 refs. [Rum.] In thinning a 10-year-old sample plot of P. X *marilandica*, it was discovered that 10% of the trees removed were infested with A. carbonaria. The larval galleries, illustrated and described, were *infected with bacteria* producing a brown stain.

Qadri, M. A. H. 1951. A PRELIMINARY STUDY OF THE POPLAR LEAF BEETLE—NODOSTOMA SP. Pakistan J. For. 1(2): 119-21. Life history, damage, etc., of the most important pest of *Populus ciliata* and P. nigra on the Murree hills. [A corrected reprint gives *Phyllodecta abdominalis* as the name of the beetle.]

52 MEASUREMENTS OF THE STEM DIMENSIONS AND VOLUME OF TREES, STANDS, FORESTS AND TIMBER

Anonymous. 1917. MEASUREMENTS OF POPULUS MONILIFERA (P. SEROTINA). Quart. J. For. 11.

524.12

Armasescu, S., and Decei, I. 1954. CERCETARIASUPRA COEFICIENTILOR DE FORMA AI ARBORILOR DE PLOP ALB SI PLOP NEGRU. [FORM FACTORS FOR TREES OF POPULUS ALBA AND P. NIGRA.] Bul. Sti. Acad. Repub. Rom. (Sect. (Sti.) Biol.) 6(2): 475-90. 6 refs. [Rum.russ.f.russ.f.]

The form *factor* (tree volume/cylindrical volume) does not vary between the two species, it varies in both with diameter as well as height, and is *constant* (0.427) for all trees of ≥ 50 cm. d.b.h. These conclusions are drawn from analysis of 404 black and 1,100 white poplars from different parts of Rumania.

Csiszar, I. 1955. FATOMEGTABLAK SZERKESZTESE. [[A STEP TOWARDS THE] CONSTRUCTION OF POPLAR VOLUME TABLES.] Erdesz. Kutatas., Budapest 1955(4): 15-29. 8 refs. [Hu.russ.e.g.]

524.315

Polycarpou, A. 1954. STANDARD VOLUME TABLES FOR POPULUS NIGRA L. "KAVAKI" IN CYPRUS. Tech. Pamphl. For. Dep. Cyprus No. 14, 1 p.

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Dzekov, S. 1959. PRVI REZULTATI KOMPARATIVNOG GAJENJA KLONOVA P. ROBUSTA, P. REGENERATA I P. THEVESTINA NA PODRUCJU SKOPSKE KOTLINE. [PRELIMINARY RESULTS OF THE COMPARATIVE CULTIVATION OF CLONES OF POPULUS X ROBUSTA, P. X REGENERATA AND P. NIGRA VAR. THEVESTINA IN THE SKOPJE BASIN.] Topola, Beograd 3(11): 895-907. 4 refs. [Serb.g.g.]

Hausrat. 1896. NOTES ON GROWTH OF P. MONILIFERA. Forstwiss. Cbl. 40: 169-70.

Mutibaric, J. 1958. NEKI PODACI O PRIRASTU MLADE SASTOJINE POPULUS ROBUSTA, P. MARILANDICA I P. SEROTINA. [SOME DATA ON

THE INCREMENT OF YOUNG STANDS OF P. X ROBUSTA, P. X MARILANDICA AND P. X SEROTINA.] Topola, Beograd No. 5: 384-95. 3 refs. [Serb.]

1962. PRILOG POZNAVANJU PRIRASTA I ZAPREMINE DOMACIH CRNIH TOPOLA I VRBE. [INCREMENT AND VOLUME OF NATIVE BLACK POPLAR AND WILLOW.] Sumarstvo 15(1/2): 39-46. 3 refs. [Serb.f.]

Gives details of d.b.h., height, volume, etc., from natural stands of black poplar averaging 36 years and willow averaging 37 on the Danube plain near Sombor, N. Vojvodina.

561.21

Popescu-Zeletin, I., and Mocanu, V. G. 1962. L'ACCROISSEMENT RADIAL DES PEUPLEMENTS PENDANT LA PERIODE DE VEGETATION. [RADIAL INCREMENT OF STANDS DURING THE GROWING SEASON.] Proc. 13th Congr. Int. Union For. Res. Organ., Vienna 1961, Pt. 2(2), Sect. 25/11-S/7, 13 pp. 7 refs. [F.]

561.3

Anonymous. 1932. GROWTH FORM OF P. LASIOCARPE. Mitt. Dtsch. Dendrol. Ges. 44: 386.

562.2

Anonymous. 1915. GROWTH AND YIELD OF BLACK POPLAR (P. NIGRA). Abstr. of Italian article. Int. Inst. Agric. Mon. Bull. (S.R.E.) 12: 1656.

Petrescu, L., and Disescu, R. 1955. PRODUCTIA SI CRESTE RILE CELUI MAI IN VIRSTA ARBORET DE PLOPI NEGRI HIBRIZI DIN TARA. [THE AGE OF MAXIMUM YIELD AND INCREMENT FOR HYBRID BLACK POPLARS IN RUMANIA.] Rev. Padurilor 70(3): 101-5. 5 refs. [Rum.]

Data are given and discussed for increment of a plantation of x *Populus marilandica*, measured at 14, 19, 24, and 32 years. C.a.i. culminated at 22, and m.a.i. at 25 years; the latter age is recommended for exploitation.

Somma. 1916. GROWTH OF BLACK POPLAR IN TUSCANY. (Abstr.) Int. Inst. Agric. Mon. Bull. (S.R.E.) 1: 92.

566 YIELD TABLES AND THEIR CONSTRUCTION

Hilf, H. H., and Schmitz-Lenders, B. 1962. [INCREMENT AND YIELD OF THE 'HARFF' POPLAR [POPULUS X 'REGENERATA'].] Forstarchiv 33(8): 166-70. 3 refs. [G.]

Matsui, Z., Moori, K., and Sasaki, M. 1955. [THE SOCIATING AND GROWING OF NATURAL STANDS ON THE BOTTOMLAND IN THE TESH- IKAGA REGION.] Spec. Rep. For. Exp. Sta., Hokkaido No. 3: 154-61. 5 refs. [Jap.e.]

Stands of Doro-poplar (*Populus maximowiczii*), four kinds of willow, elm, ash, and alder aged ca. 31 years carry volumes of 225-249 cu.m./ha. Regressions are given for height and diameter and number of stems/ha. in the main crop on age. A m.a.i. of 7 cu.m./ha. can be expected. A yield table is included.

8 FOREST PRODUCTS AND THEIR UTILIZATION

81 WOOD AND BARK: STRUCTURE AND PROPERTIES

Klauditz, W. 1951. UBER DIE MECHANISCHEN EIGENSCHAFTEN UND CHEMISCHE ZUSAMMENSETZUNG DES STAMMHOLZES ZWEIER PAPPEL-HYBRIDEN. [MECHANICAL PROPERTIES AND CHEMICAL COMPOSITION OF THE STEM WOOD OF TWO POPLAR HYBRIDS.] Holz Boh- u. Werkstoff 9(5): 81-4. 11 refs. [G.g.]

810 GENERAL INFORMATION ON WOOD

[Japan: Wood Ind.] 1957. [JAPANESE WOODS: POPULUS MAXIMOWICZII.] Suppl. to Wood Ind., Tokyo 12(6). 2 pp. [Jap.] Includes three photomicrographs and data on physical and mechanical properties.

Sachsse, H. 1961. BEITRAG ZUR KENNTNIS DER HOLZEIGENSCHAFTEN DER OXFORD-PAPPEL. [THE WOOD PROPERTIES OF THE 'OXFORD'

POPLAR.] Mitt. Ver. Forstl. Standortskunde ForstpflZucht. No. 11: 92-102. 25 refs. [G.g.]

811.12

Necesity, V. 1959. A NOTE ON THE STRUCTURE OF MICROFIBRILS IN NATIVE CELL WALLS. Svensk PappTidn. 62(3): 73-6. 11 refs. [E.s.w.g.]

81 1.22

Rosso, R. 1958(1959). OSSERVAZIONI SULLA DIFFERAZIONE DEL LEGNO DI TENSIONE IN PIANTE DI PIOPPO NERO. [THE DIFFERENTIATION OF TENSION WOOD IN BLACK POPLAR.] Nuovo G. Bot. Ital. (n.s.): 65 (3): 592-9. 5 refs. [It.it.e.]

The author studied the differentiation of tension wood from the cambium in artificially bent branches of a young tree of *Populus*

nigra, and describes the different stages of anatomical development with illustrations from photomicrographs.

Sachs, H. 1962. [ELECTRON-MICROSCOPE INVESTIGATIONS ON THE CELL-WALL STRUCTURE OF TENSION-WOOD FIBERS.] *Holz Roh-u. Werkstoff* 20(11): 429-33. 21 refs. [G.g.e.]

812 PHYSICAL AND MECHANICAL PROPERTIES

Horvat, I. 1960. PRILOG POZNAVANJU NEKIH FIZICKIH I MEHANIČKIH SVOJSTVA BIJELE I CRNE TOPOLOVINE (POPULUS ALBA L., POPULUS NIGRA L.) [SOME PHYSICAL AND MECHANICAL PROPERTIES OF THE WOOD OF P. ALBA AND P. NIGRA.] *Sum. List* 84 (3/4): 95-115. 12 refs. [Croat.croat.e.]

Lenz, O. 1956. LÉBOIS DES PRINCIPAUX PEUPLIERS ET D'UNSAULE INDIGÈNES EN SUISSE. [THE WOOD OF THE CHIEF POPLARS AND OF A WILLOW NATIVE TO SWITZERLAND.] *Mitt. Schweiz. Anst. Forstl. Versuchsw.* 32 (5): 203-27. 12 refs. [F.f.g.it.e.]

Michalak, J., Rogalinski, K., and Kubiak, M. 1963. [TESTS ON THE TECHNICAL PROPERTIES OF POPULUS × MARILANDICA WOOD.] *Roczn. Dendrol. Polsk. Tow. Bot., Warsz.* 17: 219-32. 32 refs. [Pol.e.]

Tabulates results of detailed studies of the chemical, physical, and mechanical properties of Polish-grown wood. [Cf. Kubiak, Rogalinski, and Michalak, 1962, P. *lasiocarpa* to P. *nigra* and vars., 844.2.]

Stojanov, V., and Enceev, E. 1959. POPULUS PRZEWALSKII UND IHR HOLZ. [P. PRZEWALSKII AND ITS WOOD.] *C.R. Acad. Bulg. Sci.* 12(6): 569-72. 1 ref. [G.russ.]

812.7

Hirai, S., Tsuchiya, K., and Aida, T. 1962. [MECHANICAL PROPERTIES OF THE WOODS OF POPULUSPP. OF THE TOKYO UNIVERSITY FOREST IN HOKKAIDO.] *Misc. Inform. Tokyo Univ. For. No.* 14: 63-71. 16 refs. [Jap.]

Presents tabulated results of standard tests on P. *tremulavar. davidiana* (separately for green-, orange-, and grey-barked forms) and P. *marimowiczii*, from trees 28-40 years old; also for 22 Japanese, Manchurian, or Korean provenances of P. *maximowiczii*.

Venet, J. 1955. ESSAIS SUR LA RÉSISTANCE MÉCANIQUE DU BOIS DE PEUPLIER FAITS AU LABORATOIRE DE TECHNOLOGIE DE L'ÉCOLE NATIONALE DES EAUX ET FORÊTS. [TESTS OF THE MECHANICAL STRENGTH OF POPLAR WOOD MADE AT THE ÉCOLE DES EAUX ET FORÊTS, NANCY.] *Annexe to [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-B: 9-12. [F.]* Gives the results of tests on P. *deltoides* ("carolinensis"), × P. *regenerata*, and P. *tremula*.

813 WOOD CHEMISTRY

Prosinski, S. 1954. ZBADAN NAD WYODREBNIANIEM MASY CELULOZOWEJ Z DREWNA TOPOLI CZARNEJ I BIAŁEJ. [INVESTIGATIONS ON THE PULPING OF POPULUS NIGRA AND P. ALBA.] *Sylwan* 98(3): 229-38. 19 refs. [Pol.pol.]

813.1

Babicki, R. 1960. ZAWARTOŚĆ CELULOZY I LIGNINY W DREWIE × POPULUS MARILANDICA. [THE CELLULOSE AND LIGNIN CONTENTS OF P. × MARILANDICA WOOD.] *Sylwan* 104(9): 100-6. 5 refs. [Pol.]

Simionescu, C. 1958. CONSIDERATIONS ON SOME RESULTS OBTAINED IN THE STUDY OF VEGETABLE CANCER. *Bul. Inst. Politehnic din Iasi (n.s.)* 4(3/4): 204-16. 13 refs. [E.russ.rum.] The author summarizes work already published on chemical changes in the wood of cankers occurring on pine and beech, and presents and discusses data from a similar study of an elm tumor and a poplar (*Populus nigra*). The results confirm previous findings that in cankered wood there is an increase in lignin and a corresponding decrease in cellulose, the sum of lignin and cellulose remaining constant at 70.51-74.83 percent.

813.1.1

Nakano, J., Ishizu, A., and Migita, N. 1961. STUDIES ON LIGNIN. XXXII. ESTER GROUPS OF LIGNIN. *Tappi* 44(1): 30-2. 7 refs.

Sakakibara, A., and Nakayama, N. 1961. HYDROLYSIS OF LIGNIN WITH DIOXANE AND WATER. I. FORMATION OF CINNAMICALCOHOLS AND ALDEHYDES. *J. Jap. Wood Res. Soc.* 7(1): 13-8. 11 refs. [E.e.jap.]

Data on hydrolysis products from *Picea jezoensis*, *Gafus crenata*, and *Populus nigra* wood meal.

813.14

Anderson, E., Kaster, R. B., and Seeley, M. G. 1942. HEMICELLULOSES AND PECTIC MATERIALS FROM COTTONWOOD, POPULUS MACDOUGALI. *J. Biol. Chem.* 144(3): 767-72. Bblg.

814.1

Wechel, A. Te. 1943. OVER DE DUURZAAMHEID VAN HETHOUT VAN DEN DOUGLASSPAR, DE SITKASPAR EN DEN JAPANSCHEN LARIKS. [ON THE NATURAL DURABILITY OF WOOD OF DOUGLAS FIB, SITKA SPRUCE AND JAPANESE LARCH.] *Ned. Boschb.-Tijdschr.* 16(11): 444-5. [Du.]

826.1

Nakamura, G., and Saito, M. 1960. [STUDIES ON ROTARY LATHE CUTTING. REPORT (III) EFFECT OF CUTTING CONDITIONS ON THE QUALITY OF BASSWOOD, ASPEN AND TULIP TREE VENEER.] *Bull. For. Exp. Sta., Meguro, Tokyo No.* 119: 67-78. 10 refs. [Jap.jap.e.e.] Describes tests on *Tilia japonica*, *Populus maximowiczii*, and *Liriodendron tulipifera*.

832.20

[U.K.: For. Prod. Res. Lab.] 1953. TRIALS OF TIMBERS FOR PLYWOOD MANUFACTURE. PROGRESS REPORT 18. CONSIGNMENT NO. 760. SPECIAL TESTS. BLACK POPLAR (POPULUS NIGRA) HOME GROWN. *For. Prod. Res. Lab., Princes Risborough.* 14 pp. Tests to determine the effect of the knife and pressure-bar positions on the woolly appearance of poplar veneer.

841.41

Meyer, K. 1954. ZUM HOLZSCHUTZ UND SEINER DURCHFÜHRUNG BEIM TECHNISCH VERWENDETEN PAPPELHOLZ. [WOOD PRESERVATION METHODS FOR POPLAR WOOD IN INDUSTRIAL USE.] *Abstr. in Forsch. u. Berat. (Forstw.) Landesausch. Landw. Forsch. Landes Nordrhein-Westfalen No.* 1: 136-7. [G.]

844.2

Kubiak, M., Rogalinski, K., and Michalak, J. 1962. [CHANCES IN THE PHYSICAL AND MECHANICAL PROPERTIES OF POPULUS × MARILANDICA UNDER THE INFLUENCE OF PORIA VAPORARIA.] *Sylwan* 106(3): 25-39. 26 refs. [Pol.russ.e.]

Tabulates and graphs data on the effect of pure cultures of the fungus on the properties of P. × *marilandica* specimens exposed to them for various periods. The fungus caused rapid deterioration-4 months' exposure rendered the wood useless.

— Rogalinski, K., and Michalak, J. 1962. CHANGES IN PHYSICAL AND MECHANICAL PROPERTIES OF POPLAR WOOD (POPULUS MARILANDICA BOSC.) INDUCED BY THE FUNGUS PORIA VAPORARIA (PERS./FR.). *Transl. Commonw. Sci. Industr. Res. Organ. Aust. No.* 6229, 20 pp. 1963. 26 refs. *Transl. by R. J. Zatorski from Sylwan* 106(3): 25-39.

845.3

Schultze-Dewitz, G. 1957. VERSCHIEDENARTIGE TERMITENANGRIFFE AN PAPPEL- UND DOUGLASIENHOLZ. [SPECIFIC DIFFERENCES IN TERMITE ATTACK ON POPLAR AND DOUGLAS FIB WOOD.] *Arch. Forstw.* 6(11/12): 933-41. 8 refs. [G.g.russ.e.]

861 PULP AND PAPER MANUFACTURE. TEXTILE AND OTHER CELLULOSE DERIVATIVES

Migita, N. 1939. PULPWOODS AND PULPS. II. MANUFACTURE OF PULPS FROM MANCHURIAN SPRUCE, FIB, AND ASPEN (PICEA BOVATA, ABIES NEPHEROLOPIS, AND POPULUS MAXIMOWICZII) *Cellulose Ind., Tokyo* 15: 54-8. *Chem. Abstr.* 34: 2591.

861.0

Prosinski, S. 1954. ZBADAN NAD WYODREBNIANIEM MASY CELULOZOWEJ Z DREWNA TOPOLI CZARNEJ I BIAŁEJ. [INVESTIGATIONS ON THE PULPING OF POPULUS NIGRA AND P. ALBA.] *Sylwan* 98(3): 229-38. 19 refs. [Pol.pol.]

867.5

Sarraillet, J. M. 1947(1949). CARBONES ACTIVOS DE ALAMO, SAUCE Y CEIBO. [ACTIVATED CARBON FROM *POPULUS NIGRA* "AR. ITALICA", *SALIX BABYLONICA* AND *ERYTHRINA CRISTA-GALLI*.] Revista de la Facultad de Ciencias Químicas, Universidad Nacional de la Plata No. 22: 91-109. 5 refs. [Span.]

892.1

Folgado, J. dos S. C. 1959. DIGESTIBILIDADE E VALOR ALIMENTAR DAS FOLHAS DO ULMEIRO E CHOUPO. [DIGESTIBILITY AND FOOD VALUE OF ELM AND POPLAR LEAVES.] Estud. Inform. Serv. Flor. Aquic. Portugal No. 104-G3, 16 pp. 20 refs. [Port.e.]

9 FORESTS AND FORESTRY FROM THE NATIONAL AND INTERNATIONAL POINTS OF VIEW

907.1

Arnold. 1928. LOMBARDY POPLAR AS AMENITY TREE IN UTAH. Amer. For. 34: 491.

P. ROBUSTA TO P. SUKASHEWI

FACTORS OF THE ENVIRONMENT. BIOLOGY

161.16

Jovanovic, M. 1962. [MEASUREMENT OF INTENSITY OF TRANSPIRATION IN SOME BROADLEAVED SPECIES (POPLAR, OAK, BEECH).] Topola, Beograd 6(27): 18-9. 5 refs. [Serb.f.]
Transpiration was measured on detached leaves by weighing in an electric balance immediately after detaching and after 45 minutes. **Results are given in g. of water transpired/sq.m. leaf area/hr.** Transpiration in *Populus* × *serotina* was 2-3 times as great as in *Quercus robur* or *Fagus sylvatica*.

165.71

Joachim, H.F. 1958. UBER DIE SPREEWALD-PAPPEL. [THE 'SPREEWALD' POPLAR.] Silvae Genet. 7(1): 25-30. 8 refs. [G.g.e.f.]

Jovanovic, B., and Tucovic, A. 1959. ZAPAZANJA O DEJSTVU JONIZUJUCEG ZRACENJA NA SEME I PRIRAST *POPULUS VIRGINIANA* FOUG. PRETHODNO SAOPSTENJE. [THE EFFECT OF IONIZING RADIATION ON SEEDS AND [SEEDLING] GROWTH OF *P. DELTOIDES* [× *P. SEROTINA*]. PRELIMINARY REPORT.] Sumarstvo 12(9/10): 451-62. 7 refs. [Serb.f.f.]

Jovanovic, S. 1957. PRIRODNA HIBRIDIZACIJA IZMEDU TOPOLA × *P. MARILANDICA* I × *P. SEROTINA*. [NATURAL HYBRIDIZATION BETWEEN *POPULUS* × *MARILANDICA* AND *P.* × *SEROTINA*.] Topola, Beograd No. 4: 294-7. [Serb.]
Records a case in Yugoslavia of presumed natural fertilization of *P. x marilandica* by *P. x serotina* (no other male trees existed within a radius of 4-5 km.), and recommends planting these varieties in mixture to **form a source of hybrid seed for progeny trials.**

165.72

Kobendza, R. 1953. CZYM JEST TOPOLA ROGALINSKA? [WHAT IS *POPULUS ROGALINENSIS*?] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 9: 153-66. 3 refs. [Pol.russ.e.]

Scepotjev, F. L. 1954. NOVE GIBRIDNYE FORMY OSINY. [NEW HYBRID FORMS OF ASPEN.] Dokl. Akad. Nauk SSSR 97(1): 161-4. 2 refs. [Russ.]

165.72/73

Bogdanov, P. L. 1958. NOVE GIBRIDY TOPOLEJ. [NEW POPLAR HYBRIDS.] Lesn. Hoz. 11(3): 85-6. [Russ.]
Brief notes on *Populus suaveolens* × *P. canadensis*—the "Lenin-grad poplar," and a "vegetative hybrid" taken from buds at the graft union of *P. suaveolens* and *P. canadensis*. Both are said to be fast-growing, and resistant to cold, and the "vegetative hybrid" is not susceptible to leaf rust.

176.1

Anonymous. 1912. *POPULUS SEROTINA*. Quart. J. For. 6: 263.

———. 1929. NOTE ON *P. ROBUSTA*. Dtsch. Forstw. 11: 63.

Grossheim, A. A. 1944. NOVOY PIRAMIDALY TOPOL'. [A NEW PYRAMIDICAL POPLAR.] Bot. Zhurn. SSSR 29(4): 124-5. [Russ.]

Joachim, H. F. 1958. UBER DIE SPREEWALD-PAPPEL. [THE 'SPREEWALD' POPLAR.] Silvae Genet. 7(1): 25-30. 8 refs. [G.g.e.f.]

Kobendza, R. 1953. CZYM JEST TOPOLA ROGALINSKA? [WHAT IS *POPULUS ROGALINENSIS*?] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 9: 153-66. 3 refs. [Pol.russ.e.]

Rubtsov, N. I. 1946. TYAN'SHANSKAYA OSINA. [THE TIAN-SHAN ASPEN.] Sovetsk. Bot. 14(5): 333-4. Bblg. [Russ.]

Starikov, G. F. 1960. CENNAJA PORODA SEVERA. [*POPULUS SUAVEOLENS*—A VALUABLE SPECIES IN THE NORTH OF THE U.S.S.R.] Priroda, Moskva 49(4): 104-5. [Russ.]

A brief general account covering, inter alia, distribution, stand volume, and height.

Vill. 1927. *P. ROBUSTA*, SCHNEID. Mitt. Dtsch. Dendrol. Ges. 38: 259.

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Read, R. A. 1958. SILVICULTURAL CHARACTERISTICS OF PLAINS COTTONWOOD [*POPULUS SARGENTII*]. U.S. For. Serv. Rocky Mt. For. Range Exp. Sta., Sta. Pap. No. 33, 18 pp. 25 refs.

Wijkstrom, S. 1947. POPPELN SOM SKOGSTRAD. [POPLAR AS A FOREST TREE.] Skogen 34(20): 267-8. [Sw.]

181.21

Sebald, O. 1958. UBER DIE LICHTANSPRUCHE DER PAPPELSORTEN. [LIGHT REQUIREMENTS OF POPLAR VARIETIES.] Holzzucht, Reinbek 12(2): 13. 2 refs. [G.]

Includes a note on trials with *Populus trichocarpa* and the 'Rochester' poplar (*P. trichocarpa* × *P. nigra*) which showed themselves more tolerant to shade when planted in narrow gaps, narrow gulleys or in close spacing, than black poplar hybrids.

181.34

Demortier, G., Riga, A., Darcheville, M., and others. 1954. LE DEVELOPPMENT DES BOUTURES DE *POPULUS ROBUSTA* SCHNEID. EN FONCTION DU PH ET DU RAPPORT CA/MG. [THE GROWTH OF POPLAR CUTTINGS AS A FUNCTION OF PH AND CA/MG RATIO.] Bul. Inst. Agron. Gembloux 22(1/2): 10-7. [F.f.]

Fritzsche, K., and Kemmer, C. 1959. UBER DEN EINFLUSS VON KALK AUF WACHSTUM "ND ENTWICKLUNG VON PAPPELSTECKLINGEN UNTERBESONDERERBERUCKSICHTIGUNG DES PH WERTES. [THE EFFECT OF CA ON GROWTH AND DEVELOPMENT OF POPLAR CUTTINGS, WITH SPECIAL REFERENCE TO PH.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 40 (Beitr. Pappelforsch. III) : 135-69. 27 refs. [G.g. russ.e.]

181.341

Meiden, H. A. van der. 1959. HET ONDERZOEK NAAR DE BETEKENIS "AN KALIUM VOOR DE POPULIER. [STUDIES ON THE IMPORTANCE OF K TO POPLARS.] Kali, Amsterdam 4(40): 371-6. 3 refs. [Du.] A study of deficiency symptoms in poplar leaves suggests that lack of K can only be determined by leaf analysis, less than 1% K in the leaves indicating deficiency. Analysis of leaves of *Populus × robusta* from various areas where rust was present showed that there tended to be an inverse relation between severity of attack and contents of K.

2 SILVICULTURE

226 CHANGES OF SILVICULTURAL SYSTEM. CONVERSION (BY SYSTEM OR SPECIES)

Glavac, V. 1962. [INCREASING WOOD PRODUCTION BY INTRODUCING EUROPEAN AMERICAN POPLARS INTO CERTAIN TYPES OF ALNUS GLUTINOSA COPPICE.] Sum. List 86(11/12): 415-24. 6 refs. [Serb.g.] Presents data for both species on the height, number of stems, b.a./acre, volume, and soil conditions in three 20- to 22-year poplar/alder stands in a *Pruno-Fraxinetum* area, where the growing stock of alder coppice has been greatly increased by the introduction of *Populus × serotina*.

231.4 '5

Mutibaric, J. 1955. PRIRODNO PODMLADIVANJE KANADSKJE TOPOLE. [NATURAL REGENERATION OF POPULUS "CANADENSIS".] Sumarstvo 8(5): 266-72. 2 refs. [Serb.e.f.]

231.5

Bajin, I. 1956. PRIRODNO PODMLADJIVANJE KAWADSKJE TOPOLE. [NATURAL REGENERATION OF POPULUS SEROTINA.] Sumarstvo 9(112): 89-90. 1 ref. [Serb.] Cites several examples of its regeneration by root-suckering in Yugoslavia. No general conclusions can be drawn as suckering will be influenced by site conditions and each stand must be considered separately.

232 ARTIFICIAL REGENERATION

Witkowski, L. 1937. TOPOLA KANADIJSKA W WISLKOPOLSOE I JEJ HODOWLA ZRZEZOW ORAZ NASION. [BLACK ITALIAN POPLARS IN THE POZNAN DISTRICT. THEIR PROPAGATION BY CUTTINGS AND SEED.] Roczn. Nauk Rol. 41: 301-5. [Pol.g.]

232.1

Anonymous. 1926. P. ROBUSTA REPUTED TO BE THE FASTEST CROWING POPLAR. Mitt. Dtsch. Dendrol. Ges. 37: 327.

Korczak. 1928. P. ROBUSTA IN POLAND. Forstl. Rundschau 1: 366.

232.13

Baldwin, H. I., and Funking, D. L. 1954. TWENTY YEARS' GROWTH OF HYBRID POPLARS. Fox For. Note No. 56, 2 pp. A further report on Stout and Schreiner hybrids, planted in 1935 as unrooted cuttings. The first 6 years' growth was reported in an earlier note [cf. Baldwin, 1941, *Populus* sp., 232.13. Growth was in the following descending order of clones: Geneva, Oxford, Androscoggin, Rochester, Strathglass.

Bialobok, S., and Bugala, W. 1951. PRZEGLAD PRAC HODOWLANYCH NAD TOPOLAMI I WYNIKI DOTYCHCZASOWYCH OBSERWACYJ PRZEPROWADZONYCH NAD NIEKTORYMI MIESZANCAMI TOPOLI W KORNIKU. [SURVEY OF STUDIES ON POPLAR GROWING AND RESULTS OF AVAILABLE OBSERVATIONS ON SOME POPLAR HYBRIDS AT KORNIAK.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 7: 130-58. 13 refs. [Pol.pole.]

181.4

Fransen, J. J. 1947. AANWASVERLIESEN ALS GEVOLG VAN KAAALVRETERIJ BIJ POPULUS SEROTINA HART. EN POPULUS MARILANDICA BOSCH. [LOSS OF INCREMENT IN P. SEROTINA AND P. MARILANDICA AS A RESULT OF DEFOLIATION.] "Mededeelingen" van den Directeur van den Tuinbouw April 1947: 216-32. 7 refs. [Du.e.] [See report on same subject by Fransen, J. J., and Houtzagers, G., in Ned. Boschb.-Tijdschr. 18(2): 36-9. 1946. F.A. 9, No. 608.]

182.1

Inokuma, T. 1960. FOSSIL, POPULUS SIEBOLDII FOUND IN SHIOBARA PLEISTOCENE BED, JAPAN. Poplars, Japan 9: 8. [Jap.] From abstr. in Rec. Res. Fac. Agric. Univ. Tokyo No. 11: 105. 1962. [E.] The morphology of a fossilized leaf found in this famous Pleistocene bed coincided exactly with that of a present-day sample of *P. sieboldii*. This is the first record of the species in Japanese fossilized flora.

232.322.412

Meiden, H. A. van der. 1957. REACTIE "AN POPULIERENSTEK OP FOSFAAT (EEN ORIENTERENDE PROEF). [REACTION OF POPLAR CUTTINGS TO PHOSPHATE (A PRELIMINARY EXPERIMENT.) Ned. Boschb.-Tijdschr. 29(10): 229-42. [Du.du.e.]

232.324.3

Gunther, H. 1958. WIRKUNG DER VERBANDSWEITEN AUF DIE ERZIEHUNG "ON PAPPELPFLANZEN. [THE EFFECT OF SPACING ON POPLAR PLANTS IN THE NURSERY.] Forst u. Jagd 8(1): 10-5. [G.]

232.328.1

Reinders-Gouwentak, C. A. 1953. PROBLEMS IN VEGETATIVE PROPAGATION OF POPULUS. Proc. Ned. Akad. Wet. 56 C(2): 202-5. 6 refs. [E.e.] Further experiments with *P. robusta* confirm the better rooting obtained from cuttings kept for 14 days in darkness and then given long-day treatment.

_____ and Sipkens, J. 1953. THE INFLUENCE OF PHOTO- PERIOD, DORMANCY BREAKING AND GROWTH HORMONE TREATMENT ON POPLAR CUTTINGS. Proc. Ned. Akad. Wet. 56 C(1): 71-80. 6 refs. [E.e.]

232.328.9

Haissig, B.E. 1963. SEASONAL VARIATION IN ROOT AND SHOOT FORMATION FROM LEAF CUTTINGS OF POPULUS SIMONII "AR. FASTIGIATA SCHNEID. Silvae Genet. 12(1): 31-5. 21 refs. [E.e.g.f.]

232.4

Badoux, E. 1942. LES CULTURES DE PEUPLIER DU FORT (CANTON DE VAUD). [THE POPLAR PLANTATIONS OF LE FORT (CANTON OF VAUD).] J. For. Suisse 93 (2): 33-9. Bblg. [F.]

Lallemant. 1945. LES PLANTATIONS DE PEUPLIERS EN CHAUTAGNE. [THE POPLAR PLANTATIONS IN CHAUTAGNE.] Bull. Soc. For. Franche-Comte 25(8): 316-22. [F.]

232.43

Becking, J.H. 1958. HET PLANTVERBAND VOOR POPULIEREN- OPSTANDEN. [PLANT SPACING IN POPLAR STANDS.] Ned. Boschb.-Tijdschr. 30(8): 241-3. [Du.]

[Germany: Forst u. Jagd] 1960. FLURHOLZANBAU IN DER DDR. [GROWING WOODY SPECIES OUTSIDE THE FOREST IN EAST GERMANY.] Forst u. Jagd Spec. No., 48 pp. 62 refs. [G.]

Szodfridt, I. 1960. TOLNASZIGETI KESEINYAR HALOZATKISERLET. [A SPACING TRIAL WITH POPULUS × SEROTINA IN TOLNASZIGET.] Erdo 9(7): 247-51. [Hu.russ.g.] Trials at 2 × 2, 4 × 4, 6 × 6, and 8 × 8 m. showed (at the 10th year in local conditions) 2 × 2 to yield greatest volume, and 4 × 4 the greatest value. Where hand labor is used, 2 × 2 thinned to 4 × 4 m. in the 3rd or 4th year is recommended; for mechanical cultivation, planting at 3 × 1.5 m.

Vries, P. G. de. 1961. PRODUCTIE EN STAMVORM BIJ VERSCHILLENDE PLANTVERBAND IN DE POPULIERENOPSTAND BIJ EMMELOORD, N.O. POLDER. [YIELD AND STEM FORM OF POPLAR GROWN AT DIFFERENT SPACINGS IN A STAND NEAR EMMELOORD, N.E. POLDER.] Ned. Boschb.-Tijdschr. 33(12): 347-53. [Du. du. e.]

232.5

Rohmeder, E. 1961. PAPPELBESTANDSBEGRUNDUNG IN ENGEN VERBANDEN MIT STECKLINGEN. [ESTABLISHING POPLAR STANDS WITH CUTTINGS AT CLOSE SPACINGS.] Allg. Forstzeitschr. 16(31): 449-52. 4 refs. [G.g.]

233 AFFORESTATION

Evans, W. D. D. 1952. AFFORESTATION OF WASTELAND. J. Land Agents' Soc. 51(1): 43-4.

Describes the successful afforestation of spoil from sand and gravel works with Sitka spruce and unrooted cuttings of *Populus robusta*.

Fritzsche, K., and Kemmer, C. 1961. BEITRAG ZUR FRAGE DER PAPPELDÜNGUNG AUF DILUVIALEN KIPPENSANDEN DER NIEDERLAUSITZ. [FERTILIZING OF POPLARS ON DILUVIAL SPOIL-MOUND SANDS IN THE NIEDERLAUSITZ [E. GERMANY].] Wiss. Abh. Dtsch. Akad. Landw.-Wiss., Berlin No. 52 (Beitr. Pappelforsch. No. 6): 7-21. 13 refs. [G.g. russ. e.]

238 TIMBER PLANTATION CROPS REQUIRING SPECIAL TREATMENT

Milovanovic, M. 1956. NEKA ZAPAZANJA I PODACI U MLADIM TOPOLOVIM KULTURAMA. [OBSERVATIONS AND DATA ON YOUNG POPULAR PLANTATIONS.] Sumarstvo 9(1/2): 15-26. [Serb. e. f.]

4 FOREST INJURIES AND PROTECTION

416.1.1

Joly, R. 1959. INFLUENCE DES DEFOLIATEURS FORESTIERS SUR L'ACCROISSEMENT. [THE INFLUENCE OF FOREST DEFOLIATORS ON INCREMENT.] Rev. For. Franc. 11(11): 775-84. [F.]

416.16

Pourtet, J. 1958. LE DEPERISSEMENT DES PEUPLIERS DANS LE NORD-EST DE LA FRANCE AU PRINTEMPS 1958. [THE DIE-BACK OF POPLARS IN N.E. FRANCE IN SPRING 1958.] Rev. For. Franc. 10(8/9): 521-5. [F.]

The severe die-back described was found to be mainly in *Populus × robusta* plantations more than 20 years old, in regions with a predominantly continental climate, and situated in valley bottoms. It is ascribed to the severe frosts of Feb. 1956 followed by unfavorable conditions (mild winters with late frosts) in 1957 and 1958.

1961. A PROPOS DU DEPERISSEMENT "CLIMATIQUE" DES PEUPLIERS. [THE "CLIMATIC" DIE-BACK OF POPLARS.] Rev. For. Franc. 13(1): 31-4. [F.]

Further examination of *Populus × robusta* plantations affected by the severe frosts of 1956 followed by mild winters and late frosts in 1957 and 1958 showed 3 types of reaction: (1) irreversible dieback in old or sickly trees; (2) a sharp reduction in increment and striking, but reparable, die-back in young (15-20 years) trees on good sites; (3) reduction in increment with no visible signs of ill health in quite young (10 years) and vigorous trees.

424.7

Benzian, B., and Warren, R. G. 1957. COPPER DEFICIENCY IN POPLAR CUTTINGS. Rep. Rothamst. Exp. Sta. 1956: 57-8.

In 1955 "needle-tip-burn" on Sitka spruce seedlings grown at Wareham was shown to be due to Cu deficiency. The black discoloration of the leaves of *Populus robusta* cuttings grown on the same soil has now been diagnosed as a deficiency on the same micronutrient. Symptoms were greatly reduced by a soil application of a fritted trace-element material containing Fe, Mn, Cu, Zn, Mo, and B, and by foliar sprays of Cu applied as a lime/CuSO₄ mixture.

Kannenberg, H. 1963. [CAN POPULUS "ROBUSTA" SUFFER FROM CU DEFICIENCY?] Holzzucht, Reinbek 17(1/2): 14. [G.]

In two series of open-air pot trials in a sandy soil with high humus and little Cu content (2.1 or 0.8 p.p.m.) plus an N/P/K fertilizer, the addition of 7.5 kg. Cu/ha. greatly increased height growth and improved habit over the excessively bushy controls. Three years after planting as cuttings, the treated plants were 159 vs. 116, and 118 vs. 82 cm. respectively.

435.3

Decoux, L. 1963. [A FIRE IN A POPLAR PLANTATION.] Bull. Soc. For. Belg. 70(8/9): 440.1. [F.]

A note on a fire caused by neglect of drainage ditches and consequent provision of fuel in the form of dense growth of *Phragmites communis*. Some 30 trees (*Populus × robusta*) were killed and 30 more suffered fire wounds.

443.3

Braun, H., and Hubbes, M. 1957. ANTIBIOTICS. SPORENINFEKTION UND ANTAGONISMUS BEI DOOTHICHA POPULEA. [SPORE INFECTION AND ANTAGONISM IN D. POPULEA.] Naturwissenschaften 44(11): 333. [G.]

Peno, M. 1959. NOVOZAPAZENA PATOLOSKA POJAVA NA TOPOLAMA. [A NEWLY OBSERVED PATHOLOGICAL PHENOMENON ON POPLARS.] Topola, Beograd 3(10): 872-3. [Serb.]

Describes the symptoms of an unidentified bark necrosis attacking 1- and 2-year-old sets of *Populus × robusta* and *P. × serotina* in at least two areas in Yugoslavia. Laboratory studies on the physiology of the pathogen are outlined.

1960. POJAVA NOVE GLJIVICE NA TOPOLI. [THE OCCURRENCE OF A NEW FUNGUS ON POPLAR.] Topola, Beograd 4(13/14): 13-4. 1 ref. [Serb.]

The cause of a new bark necrosis of poplar [see preceding abstract] has been identified as *Chaetomella tortilis* (*Sphaeropsidales*), which normally lives in the soil as a saprophyte. Its pathogenicity is considered to be the result of abnormal soil conditions (soil exhaustion, inadequate water regime, etc.). Further details of its physiology and life history are given.

Rader-Roitze, J. E. 1956. BEOBACHTUNGEN UBER DAS AUFTRETEN DES CYTOSPORAKRANKHEIT AN JUNGPOPPELN. [THE OCCURRENCE OF CYTOSPORACHRYSPERMA ON YOUNG POPLARS.] Schweiz. Z. Forstw. 107(8/9): 490-503. 6 refs. [G.g. f.]

Discusses possible causes of mass infections of 2-year planting stock (not cut back) of *Populus serotina*, developing at many different sites in Bavaria. No obvious mistakes in tending or transport could be found, and 1-year plants at the supplying nursery showed no symptoms. From examination of roots and root collars, and preliminary experiments on the germination of *Cytospora* spores in soil, root infection from infected soil is considered the most likely cause.

444 CLIMBER CUTTING, ETC.

Brcak, J., and Blattny, C., Sr. 1962. ELECTRON MICROSCOPIC INVESTIGATIONS OF POPLAR MOSAIC. Phytopathology 52(9): 954-5. Threadlike particles, with a normal (weighted average) size of 626 × 12 mμ, found on leaves of *Populus × serotina* exhibiting typical mosaic symptoms, are thought to represent the virus.

Frezzi, M. J. 1957. PHYTOPHTHORA CRYPTOGEA, CAUSANTE DE LA MUERTE DE POPULUS SIMONII, EN MENDOZA (ARGENTINA). [P. CRYPTOGEA CAUSING DEATH OF POPULUS SIMONII IN MENDOZA, ARGENTINA.] Rev. Argent. Agron. 24(4): 136-43. 20 refs. [Span.]

Reviews the literature on *P. cryptogea*, and describes its morphology, culture, and biological characteristics. A new species in Argentina, it has caused the death of many large specimens of *Populus simonii*, killing the roots and causing active localized cankers on the root collar and stem.

453 INSECTS

Klug, W. 1954. DIE BALSAMPAPPELN ALS FANGBAUME. [BALSAM POPLARS AS TRAP TREES.] Allg. Forstztg. 65(11/12): 155-6. [G.]

The author's suggestion is based on an observation made on indi-

vidual trees of Populus simonii, interspersed in stands of *P. robusta* and *P. angulata*. The former were heavily infested with *Saperda carcharias* and *Cossus cossus*, and were riddled with woodpecker holes from base to man's height, while the latter were hardly affected.

5 FOREST MENSURATION

524.3 15

Pozdnjakov, L. K. 1955. OB'EM I SBEGSTVOLOV TOPOLJA DUZISTOGO I COZENII KRUPNOCESUJCSOJ. [VOLUME AND TAPER OF POPULUS SUAVEOLENS AN' CHOSENIA MACROLEPIS STEMS.] Soebzc. Inst. Les. No. 4: 87-91. [Russ.]

Presents volume and taper tables (both o.b. and u.b.) for 4-cm. diam. classes up to 60 cm. for *P. suaveolens*, and 52 cm. for *C. macrolepis*, both on quality I sites in Yakutia.

548 RELATION OF FOREST SITE QUALITY TO TOTAL PRODUCTION OF VEGETABLE MATTER

Decic, T. P. 1948. THE EFFECTS OF MINOR SITE VARIATIONS ON THE GROWTH OF POPLARS. Rep. on Spec. Subj., Imp. For. Inst., Oxf. 11 pp.

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Dzekov, S. 1959. PRVI REZULTATI KOMPARATIVNOG GAJENJA KLONOVA P. ROBUSTA, P. REGENERATA I P. THEVESTINA NA PODRUČJU SKOPAKE KOTLINE. [PRELIMINARY RESULTS OF THE COMPARATIVE CULTIVATION OF CLONES OF POPULUS × ROBUSTA, P. × REGENERATA AND P. NIGRA VAR. THEVESTINA IN THE SKOPJE BASIN.] Topola, Beograd 3(11): 895-907. 4 refs. [Serb.g.]

Mutibaric, J. 1958. NEKI PODACI O PRIRASTU MLADE SASTOJINE POPULUS ROBUSTA, P. MARILANDICA I P. SEROTINA. [SOME DATA ON THE INCREMENT OF YOUNG STANDS OF P. × ROBUSTA, P. × MARILANDICA AND P. × SEROTINA.] Topola, Beograd No. 5: 384-95. 3 refs. [Serb.]

48 INJURIES DUE TO UNKNOWN OR COMPLEX CAUSES

Joachim, H. -F., and Templin, E. 1962. [DEATH OF POPLAR IN THE FLOODLAND FOREST OF THE ELSTER "ALLEY."] NachrBl. Dtsch. PflschDienst. (Berlin) 16(5): 81-8. 23 refs. [G.g.russ.e.]

Waters, W. T. 1950. BLACK ITALIAN POPLARS AT THETFORD. J. For. Comm. No. 21: 95-7. Data on increment.

561.25

Szodfridt, I. 1961. ADATOK A KESEINYAR ALLOMANYOK KORLAPTERULETNEK NOVEKEDESEHEZ. [BASAL AREA INCREMENT IN POPULUS SEROTINA STANDS.] Erdo 10(11): 499-504. [Hu.russ.g.]

566 YIELD TABLES AND THEIR CONSTRUCTION

Matsui, Z., and Onodera, S. 1955. [THE COMPOSITION AND GROWTH OF THE SECONDARY STAND ON THE BURNT-OVER LAND IN KITAYUBETSU DISTRICT.] Spec. Rep. For. Exp. Sta., Hokkaido No. 4: 193-216. 6 refs. [Jap.jap.e.e.]

Trifunovic, D. 1960. RACIONALNI MET" IZRADE TABLICA PRINOSA I PRIRASTA ZA JEDNODOBNE SASTOJINE KRATKE OPHODNJE. [A RATIONAL METHOD OF MAKING YIELD AND INCREMENT TABLES FOR EVEN-AGE STANDS OF SHORT ROTATION.] Sumarstvo 13(1/2): 15-28. 15 refs. [Serb.f.]

The method, based on stand age, mean diameter, mean height, and number of stems/ha., is described in detail and illustrated for *Populus × serotina* aged 5-35.

Volkman, J. H. 1958. WELCHE HOLZERTRAGE SIND AUS DER STEIGERUNG DES PAPPELANBAUS IN WESTDEUTSCHLAND ZU ERWARTEN. [HOW MUCH WOOD MAY BE EXPECTED FROM THE INCREASED POPLAR GROWING IN W. GERMANY?] Allg. Forstzeitschr. 13(38): 533.6. 12 refs. [G.]

8 FOREST PRODUCTS AND THEIR UTILIZATION

810 GENERAL INFORMATION ON WOODS

Dubois, F. 1955. ESSAIS INDUSTRIELS SUR LE BOIS DU PEUPLIER DE SELYS. [INDUSTRIAL TESTS ON THE WOOD OF POPULUS SEROTINA CV. DE SELYS.] Spec. Pap. 8th Sess. Int. Poplar Comm., Madrid 1954 No. FAO/CIP/75-D Add. 1: 85.91. [F.]

Pallay, N. 1938. INFORMATORY RESEARCH ON THE TECHNICAL QUALITIES OF POPULUS CANADENSIS AND P. ROBUSTA. Erdesz. Lapok. 77(10): 850-61. [Hu.g.f.e.]

811 STRUCTURE. IDENTIFICATION

Pinker, K., and Linskens, H. F. 1958. VERGLEICHENDE UNTERSUCHUNG DER ANATOMISCHEN UND PHYSIKALISCHEN EIGENSCHAFTEN DES HOLZES "ON POPULUS SIMONII" UND POPULUS ROBUSTA. [COMPARATIVE STUDIES ON THE ANATOMICAL AND PHYSICAL PROPERTIES OF P. SIMONII AND P. ROBUSTA.] Holz. Roh- u. Werkstoff 16(9): 325-7. 8 refs. [G.g.e.]

81 1.14

Meyer-Uhlenried, K. -H. 1958. HOLZANATOMISCHE UNTERSUCHUNGEN AN DER PAPPEL. [ANATOMICAL STUDIES OF POPLAR WOOD.] Holzforschung, Berlin 11(5/6): 150-7. 30 refs. [G.g.e.]

81 1.156

Liese, W., and Ammer, U. 1958. UNTERSUCHUNGEN UBER DIE LANGE DER HOLZFASER BEI DER PAPPEL. [INVESTIGATIONS ON THE LENGTH OF WOOD FIBRES IN POPLARS.] Holzforschung, Berlin 11(5/6): 169-74. 26 refs. [G.g.e.]

_____ and Ammer, U. 1958. INVESTIGATIONS OF WOOD FIBRE LENGTH IN POPLAR. Transl. Commonw. Sci. Industr. Res. Organ. Aust. No. 4205, 12 pp. 1958. Transl. by W. Knie and E. Bolza from Holzforschung, Berlin 11(5/6): 169-74.

812 PHYSICAL AND MECHANICAL PROPERTIES

Campredon, J., and Villiere, A. 1954. ETUDES SUR LE BOIS DE PEUPLIER ROBUSTA. [STUDIES ON THE WOOD OF × POPULUS ROBUSTA.] Rev. For. Franc. 6(5): 311-5. [F.] A preliminary report on studies made by the Centre Technique du Bois at the suggestion of the International Poplar Commission, in order to determine standard methods of testing poplar wood. The study was made on 14 logs of the hybrid *P. robusta* from 7 trees of different provenances and included sawing, seasoning, and veneer peeling as well as mechanical strength tests.

Mutibaric, J. 1962. [SOME PHYSICAL PROPERTIES OF THE WOOD OF POPULUS × SEROTINA.] Drvna Ind. 13(7/8): 122-7. 5 refs. [Serb.e.e.]

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[France: For. France] 1954. COMPTE RENDU DES RECHERCHES SUR PEUPLIERS "ROBUSTA." [RESEARCH ON THE WORKING QUALITIES OF POPULUS ROBUSTA WOOD.] For. France No. 52: 11. [F.] Tests carried out at the Centre Technique du Bois on wood 22-32 years old indicates that veneer can be cut from logs of 35-40 cm., but not satisfactorily from smaller ones. The arrangement of branches makes it possible to cut short logs clear of all knots. The wood nails well and is suited for box manufacture. Owing to its short life, however, it is difficult to obtain large sound logs, and pulpwood is probably its best use.

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——— and Hahn, G. 1960. THE POLYURONIDE CONTENT OF SOME GERMAN WOODS, AND OF HOLOCELLULOSES AND HEMICELLULOSES PREPARED FROM THEM. *Transl. Commonw. Sci. Industr. Res. Organ. Aust. No. 5142*, 12 pp. 1960. 52 refs. *Transl. by E. Pichler from Holzforschung, Berlin 14(2): 52-6.*

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Inokuma, T., Shimaji, K., and Furuya, M. 1962. [STUDIES ON POPLARS (2). MEASUREMENT OF FIBRE-LENGTH AND SPECIFIC GRAVITY OF YAMANARASHI (POPULUS SIEBOLDII).] *Bull. Tokyo Univ. For. No. 56*: 315-32. 31 refs. [Jap.jap.e.e.]

Discusses the distribution of both these characters in a 28-year stem, illustrating each with a stem-analysis diagram. *Fibre length ranged from 800 to 1,260 μ , mean 967.1, and sp. gr. from 0.28 to 0.64, mean 0.422. [Cf. Inokuma, Shimaji, and Hamaya, 1956, P. grandidentata to, P. japono-gigas, 815.31]*

832.3

Anonymous. 1945. ASPEN SOMTANDSTICKSVIRKE. [ASPEN AS A MATCH TIMBER.] *Svenska SkogsvForen. Tidskr. 43(6)*: 479-87. [Sw.]

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Meyer, K. 1954. ZUM HOLZSCHUTZ UND SEINER DURCHFUHRUNG BEIM TECHNISCH VERWENDETEN PAPPELHOLZ. [WOOD PRESERVATION METHODS FOR POPLAR WOOD IN INDUSTRIAL USE.] *Abstr. in Forsch. u. Berat. (Forstw.) Landesaussch. Landw. Forsch. Landes Nordrhein-Westfalen No. 1*: 136-7. [G.]

P. TREMULA

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

114.351

Bloomfield, C. 1955. EFFECTS OF LEAF EXTRACTS ON SOIL CONSTITUENTS. *Rep. Rothamst. Exp. Sta. 1954*: 59.

114.61166

Runov, E. V., and Egorova, S. V. 1962 [COMPARATIVE CHARACTERIZATION OF THE SOIL MICROFLORA UNDER BROADLEAVED SPECIES IN THE TELLERMAN EXPERIMENTAL FOREST.] *Soobsc. Lab. Lesoved., Moskva No. 7*: 64-9. 7 refs. [Russ.]

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Seiskari, P., and Suomus, H. 1958. FELLING ASPEN AND THE MANAGEMENT OF ASPEN STANDS FOR WINTER FOOD FOR GAME. *Suomen Riista, Helsinki 12*: 21-42. [Fie.] From *abstr. in Biol. Abstr. 35(8)*: 20335. 1960. *Experiments showed that hare and elk collect to feed where aspen are felled, and that elk can be kept away from pine seedling stands by making aspen available. For continuous winter feeding, felling must be planned so that an average of only 1/40 of the aspen of an area is taken.*

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Charaux, C., and Rabate, J. 1942. THE CHCl₃ COMPLEX OF ASPEN LEAVES. SALICYLOYLPOPULOSIDE AND SALICYLIC SALICOSIDE. *J. Pharm. Chim., Paris [9](2)*: 289-303. *Chem. Zbl. II*: 2599-600. 1942. *Chem. Abstr. 38*: 2327-8.

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Krupenikov, I. A. 1945. SALT RESISTANCE OF ASPEN UNDER NATURAL CONDITIONS. *C.R. (Dokl.) Acad. Sci. U.R.S.S. 49(5)*: 377-80. *Bblg [E.]*

161.35

Koltsnicenko, M. V. 1962. /SEASONAL VARIATION OF THE BIOCHEMICAL ACTIVITY OF EXCRETIONS FROM ASPEN LEAVES.] *Fiziol. Rast. 9(6)*: 733-5. 8 refs.

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Jablokov, A. S. 1960. O STADIJNOJ RAZVITI LESNYH DREVESNYH POROD [THE STADIAL DEVELOPMENT OF WOODY FOREST SPECIES.] *Sborn. Rabot Lesn. Hoz. Vsesojuz. Nauc.-Issled. Inst. Lesovod. No. 40*: 33-61. [Russ.russ.]

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Eklundh-Ehrenberg, C., Euler, H. von, and Hevesy, G. 1946. NOTE ON THE NUMBER OF POLLEN GRAINS IDENTIFIED IN THE FRUIT OF THE ASPEN. *Arkiv. For. Kemi, Mineralogi Och Geologi, Stockh. 23B(5)*. 5 pp. [E.e.]

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Obminski, Z. 1953. ZOBSEWACJI I STUDIOW NAD KWITNIENIEM OSIKI. [OBSERVATIONS OF AND STUDIES ON THE FLOWERING OF ASPEN.] *Sylvan 97(5)*: 353-61. 10 refs. [Pol.] Summarizes provisional results of observations on the morphology and anatomy of flowers of *Populus tremula*.

165 PHYLOGENY, EVOLUTION, HEREDITY, GENETICS AND BREEDING, VARIATION

Johnsson, H. 1956. HETEROSISERSCHINUNGEN BEI HYBRIDEN ZWISCHEN BREITENGRADRASSEN "ON POPULUS TREMULA. [HETEROSIS IN P. TREMULA HYBRIDS FROM PARENTS OF DIFFERENT LATITUDINAL PROVENANCES.] *Z. Forstgenet. 5(5/6)*: 156-60. 5 refs. [G.g.e.f.]

165.3

Johnsson, A. 1947. TIOARSASFORADLING VI' FORENINGEN FOR VAXTFORADLING A' SKOGSTRAD. [TEN YEARS' ASPEN BREEDING BY THE SWEDISH FOREST TREE BREEDING ASSOCIATION.] *Medd. Foren. Vaxtforadl. Skogstrad No. 46*, 9 pp. [Sw.]

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Borset, O. 1944. VEKSTFORDLING AV OSP. [SELECTIVE BREEDING OF ASPENS.] *Tidsskr. Skogbr. 52(5/6)*: 81-97. *Bblg. [Nor.]*

Johnsson, H. 1939. 1938 ARS FORADLINGSARBETE MED HOGKROM-OSOMIG ASP. [BREEDING WORK IN 1938 WITH POLYPLOID ASPEN.] *Medd. Foren. Vaxtforadl. Skogstrad (no number)*. 5 pp. [Sw.c.]

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——— 1941. EXPERIENCES AND RESULTS FROM THREE YEARS' ASPEN BREEDING BY THE SWEDISH TREE BREEDING ASSOCIATION. *Svensk PappTidn. 44*: 463-8, 486-8. *Abstr. in Auszuge aus der Literatur-suppl. to Papierfabrikant 40(9/10)*: 10. 1942. [G.]

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1942. MOGLICHKEITEN DER ZUCHTUNG NEUER OKOTYPEN NACHKREUZUNG. [POSSIBILITIES OF BREEDING NEW ECOTYPES BY HYBRIDIZATION.] *Zuchter* 14(12): 282-5. [G.]

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Barnes, B. V. 1958. ERSTE AUFNABME EINES SECHSJAHRIGEN BESTANDES "ON ASPENHYBRIDEN. [PRELIMINARY DATA FROM A SIX-YEAR-OLD STAND OF ASPEN HYBRIDS.] *Silvae Genet.* 7(3):98-102. 14 refs. [G.e.f.]

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Bergstrom, I. 1940. ON THE PROGENY OF DIPLOID $\times$ TRIPLOID POPULUS TREMULA WITH SPECIAL REFERENCE TO THE OCCURRENCE OF TETRAPLOIDY. *Hereditas*, Lund 26: 191-201. *Plant Breed. Abstr.* 10: 882.

Dimpflmeier, R. 1963. [RESULTS OF 5 YEARS OF COMBINATIVE BREEDING EXPERIMENTS WITH POPULUS TREMULA.] *Forstwiss. Cbl.* 82(9/10): 295.304. 10 refs. [G.]

Elorrieta, J. 1957. INFORMES SOBRE LAS ACTIVIDADES DE LAS COMISIONES NACIONALES. ESPANA. INVESTIGACIONES SOBRE LOS CHOPOS CULTIVADOS EN ESPANA. [PROGRESS REPORTS OF NATIONAL [POPLAR] COMMISSIONS. SPAIN. RESEARCH ON POPLARS CULTIVATED IN SPAIN.] [Docum.] 9th Sess. Int. Poplar Comm., Paris 1957 No. FAO/CIP/86-F Add. 2, 2 pp. [Span.] Includes a report on heterosis observed in *Populus tremula* $\times$ *P. alba* and *P. tremula* $\times$ *P. alba* var. *bolleana* hybrids, in contrast to the experience of W. Wettstein and C. Heimburger, who obtained poor results with the first combination.

Janson, L. 1960. ANALIZA PRZYROSTU SIEWEK MIESZANCOV TOPOLI. [ANALYSIS OF GROWTH OF HYBRID POPLAR SEEDLINGS.] *Sylwan* 104(1): 77-89. [Pol.russ.e.] (*Biul. Inst. Bad. Lesn.* No. 1. 1960.)

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1945. CHROMOSOMENUMBERS OF THE PROGENY FROM THE CROSS TRIPLOID $\times$ TETRAPLOID POPULUS TREMULA. *Hereditas*, Lund 31(3/4): 500-1.

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Nilsson-Ehle, H. 1938. FRAMSTALLNING AV SKOGSTRAD MED OKAT KROMOSOMTAL OCH OKAD VIRKESPRODUKTION. [PRODUCTION OF FOREST TREES WITH INCREASED CHROMOSOMENUMBER AND INCREASED TIMBER YIELD.] *Svensk PappTidn.* No. 2, 5 pp. [Sw.] *Plant Breed. Abstr.* 10: 883.

Schonbach, H. 1960. EINIGE ERGEBNISSE ACHTJAHRIGER ZUCHTUNGSVERSUCHE MIT PAPPELARTEN DER SEKTION LEUCE. [SOME RESULTS OF 8-YEAR-OLD BREEDING TRIALS WITH POPLAR VARIETIES OF THE SECTION LEUCE.] *Wiss. Abh. Dtsch. Akad. Landw. Wiss.*, Berlin No. 44 (Beitr. Pappelforsch. No. 4): 7-21. 3 refs. [G.g.russ.e.] [Cf. Schonbach, 1957, *Populus* Section Leuce, 165.41.]

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and Dathc, B. 1962. [RESULTS OF 12 YEARS' BREEDING WORK WITH INDIGENOUS ASPEN AND] PROPOSALS FOR PRACTICAL

APPLICATION.] *Sozial. Forstw.*, Berlin 12(10): 309-15. 9 refs. [G.g.]

Seitz, F. W. 1954. UBER DEN SELBSTUNGS- UND KREUZUNGSERFOLG BEI VERWENDUNG DES POLLENS DER ZWITTRIGEN GRAUPAPPEL VON DILLINGEN. [RESULTS OF SELFING AND CROSSING "SING POLLEN OF THE DILLINGEN ANDROGYNOUS GREY POPLAR.] *Abstr. in Z. Forstgenet.* 3(6): 141. [G.]

1958. FRUHTREIBVERSUCHE MIT BLUHREISERN DER ASPE. [EXPERIMENTS IN EARLY DEVELOPMENT OF FLOWERING BRANCHES OF ASPEN.] *Silvae Genet.* 7(3): 102-5. 8 refs. [G.g.e.f.]

1959. EINIGE ERFAHRUNGEN BEI DER ANZUCHT "ON ASPENSAMLINGEN. [SOME EXPERIENCES IN RAISING ASPEN FROM SEED.] From *abstr. in Silvae Genet.* 8(4): 124-5. [G.] Advocates a method of cutting back first-year seedlings, in order to spread over 2 years experiments in diallele crossings of aspen, thereby obtaining a larger quantity of material for investigation.

Wettstein, W. von. 1937. INCREASING PERFORMANCE BY CROSSING TREES OF DIFFERENT PROVENANCE IN POPULUS TREMULA. *Naturwissenschaften* 25: 434-436. *Plant Breed. Abstr.* 8(5): 493. 1938.

Wettstein, W. 1954. KURZE INFORMATION UBER DIE ZITTERPAPPEL ("ASPE"). [A NOTE ON POPULUS TREMULA.] *Allg. Forstztg.* 65(21/22): 263-4. [G.]

A general description of distribution, site requirements, growth characteristics and uses, with an account of earlier (1936-39) experiments in crossing plants from widely distant habitats, followed by a table, with explanations, giving 1st-year growth results for 26 inter- and intraspecific crossings of *P. tremula*, *P. alba*, *P. grandidentata*, and *P. tremuloides*. All hybrids showed better growth than *P. alba*, and local combinations were better than combinations with American species. Hot-house ripened seeds lengthened the vegetation period and resulted in bigger 1-year seedlings.

Zurbin, A. I. 1951. POVYSENIE SKRESCIVAEMOSTI VIDOV TOPOLEI PRI POMOSCI PREDVARITEL'NOGO VEGETATIVNOGO SBLIZENIJA. [INCREASING THE CAPACITY OF POPLAR SPECIES FOR HYBRIDIZATION BY PREVIOUS GRAFTING [OF ONE PARENT UPON A STOCK OF THE OTHER].] *Priroda*, Moskva 40(4): 66. [Russ.]

165.42

Muntzing, A. 1936. THE CHROMOSOMES OF A GIANT POPULUS TREMULA. *Hereditas*, Lund 21: 383-93. *Plant Breed. Abstr.* 6(4): 1405. 1936.

Sarvas, R. 1958(1959). KAKSI TRIPLOIDISTA HAAPAA JA KOIVUA. [TWO TRIPLOID ASPENS AND TWO TRIPLOID BIRCHES.] *Commun. Inst. For. Fenn.* 49(7). 25 pp. 21 refs. [F.i.c.e.] An account of the growth characteristics and chromosome complement of two *Populus tremula* clones and two specimens of *Betula verrucosa*, the only triploid trees of these species so far discovered in Finland.

Tometoip, G. 1937. THE CHROMOSOME NUMBERS OF TWO NEW GIANT POPULUS TREMULA. *Bot. Notiser* 1937: 285.90. *Plant Breed. Abstr.* 8(2): 191. 1938.

Tralau, H. 1957. UBER EINE HAPLOIDE FORM VON POPULUS TREMULA AUS UPPLAND. [A HAPLOID FORM OF *P. tremula* FROM UPPLAND.] *Bot. Notiser* 110(4): 481-3. 16 refs. [G.] Describes a spontaneous haploid form, characterized by its bushy and stunted growth, and small leaves. Chromosome numbers in the root tips were $2n = \pm 19$.

165.43

Johnsson, H. 1953. DEVELOPMENT OF TRIPLOID AND DIPLOID POPULUS TREMULA DURING THE JUVENILE PERIOD. *Z. Forstgenet.* 2(4): 73-7. 7 refs. [E.g.]

Mattila, R. E. 1961. ON THE PRODUCTION OF THE TETRAPLOID HYBRID ASPEN BY COLCHICINE TREATMENT. *Hereditas*, Lund 47(3/4): 631-40. 7 refs. [E.e.] Seeds of hybrid aspen (*Populus tremula* $\times$ *P. tremuloides*) were treated with 0.1% colchicine solution. The appearance and stomatal characteristics of seedlings produced are described. Growth of amphidiploid seedlings was satisfactory.

165.5

Anonymous. 1937. A SPONTANEOUS, GIANT FORM OF *POPULUS TREMULA*. Bull. Soc. For. Belg. 44(1) : 22-6.

Blomquist, S.G. 1937. ON *POPULUS TREMULUS GIGAS*. Bot. Notiser 1937(1/2) : 119-23. Plant Sci. Lit. 5(17) : 7. 1937.

Bonde, C. P. 1939. SOME OBSERVATIONS ON THE PLANTATIONS NOW MADE OF GIANT ASPEN. Skogsagaren 15(6) : 147-9. [Sw.]

Bouvarel, P., and Fourchy, P. 1954. A PROPOS DU TREMBLE DES ALPES: LES TREMBLES DE LA VALLEE D' FERRAND (ISERE). [THE ALPINE RACE OF ASPENS: THE ASPENS OF THE VALLEE DU FERRAND (ISERE).] Rev. For. Franc. 6(10) : 601-3. 2 refs. [F.]

Gambi, G. 1954. IL PIOPPO TREMULO DELL' ASPROMONTE. [THE ASPROMONTE ASPEN.] Monti e Boschi 5(4) : 161-4. [It.f.e.] Describes a race of *Populus tremula* of particularly good form and vigorous growth, occurring at Aspromonte (Calabria).

Kononov, N.A. 1963. [SELECTION AND BREEDING OF FAST-GROWING TREE SPECIES IN THE CENTRAL URALS.] Lesn. Hoz. 16(7) : 55-8. [Russ.]

Melander, Y. 1938. A NEW GIANT *POPULUS TREMULA* IN NORRBOTEN. Hereditas, Lund 24(1/2) : 189-94. Plant Sci. Lit. 7(8) : 8. 1938.

Nilsson-Ehle, H. 1936. ON A GIGAS FORM OF *P. TREMULA* FOUND IN NATURE. Hereditas, Lund 21 : 379-82. Plant Breed. Abstr. 6(4) : 1404. 1936.

———. 1938. JATTEASPEN. DEN MODERNA SVENSKA SKOGSFORADLINGENS UPPTAKT. [THE GIANT ASPEN. THE RECENT SWEDISH DISCOVERY IN FOREST IMPROVEMENT.] Nord. Familjeboks Manadskronika 1(2). 6 pp. [Sw.] Plant Breed. Abstr. 10 : 884.

Ojamaa, M. M. 1961. BIOLOGICKÉ FORMY OSINY V LESAH JUZNO, CASTI ESTONII. [BIOLOGICAL FORMS OF *POPULUS TREMULA* IN S. ESTONIA.] Lesn. Hoz. 14(2) : 11-4. [Russ.] Describes the four forms [see following reference]; the grey-barked form is the commonest here too, and the green-barked form is the best, particularly as regards resistance to heart rot. Thinnings should favor the green-, and remove the grey- and dark-barked forms.

Orlenko, E. 1960. WARTOSCIOWA FORMA OSIKI ROASNCEJ W LASACH BIALORUSI. [A VALUABLE FORM OF ASPEN CROWING IN BELORUSSIA.] Sylwan 104(1) : 15-9. 7 refs. [Pol.]

Sarvas, R. 1950. JATTILAISHAAPA HELSINGIN KAUPUNGISSA. [A GIANT ASPEN IN HELSINKI.] Metsat. Aikak. 1950(3/4) : 98-100. 7 refs. [Fie.]

Wettstein, W. von. 1937. INDIVIDUAL DIFFERENCES BETWEEN ASPEN SEEDLINGS. Forstarchiv 13(9) : 149-51. [G.]

Yabl'kov, A. S. 1941. ISPOLINAKAY FORMA OSINY V LESAKH U.S.S.R. [A FORM OF *POPULUS TREMULA GIGANTEA* IN THE FORESTS OF THE U.S.S.R.] Trud. Vsesoyuz. Nauchno-issledov. Inst. Lesnogo Khoz. 'VNILKh' No. 23, 52 pp. Bblg. [Russ.russ.]

Zachej, S. 1961. VYBEROVÉ STROMY OSIKY. [SELECTED SPECIMENS OF ASPEN.] Lesn. Cas. 7(5) : 319-30. 9 refs. [Slovak.slovak.russ.g.]

Lists the locality, age, dimensions, and form of 62 selected good specimens of *Populus tremula* found by the author in Slovakia, and useful for breeding and propagation. [See Zachej, 1960, *P. tremula*, 181-1.]

165.53

Danilov, M. D. 1954. RANO- I POZDNONRASPUSKAYUSIESIA FORMY OSINY. [THE EARLY- AND LATE-FLUSHING FORMS OF *POPULUS TREMULA*.] B'ulleten' Moskovskogo Obschestva Ispytatelej Prirody (Otdel Biol.), Moskva 59(5) : 21-39. [Russ.] From abstr. in Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 11 : 540. 1956. [Pol.]

Liebeswar, K. 1961. BEOBACHTUNGEN UBER DEN ZEITPUNKT DES AUSTRIEBES VERSCHIEDENER LAUBBAUME UND DEREN VEGETATIVER UND GENERATIVER NACHKOMMENSCHAFTEN. [FLUSHING DATES OF SOME BROADLEAVED TREES AND THEIR VEGETATIVE AND SEEDLING PROGENY.] Allg. Forstztg. 72 (21/22), Suppl. (Informationdienst No. 50), p. 2. 8 refs. [G.]

Sylvén, N. 1940. LANG- OCH KORTDAGSTYPER AV DE SVENSKA SKOGSTRADEN. [LONG- AND SHORT-DAY TYPES OF SWEDISH FOREST TREES.] Svensk PappTidn. 43 : 317-24, 332-42. [Sw.]

165.7

Gombocz. 1928. ARTIFICIAL CROSSING BETWEEN *P. ALBA* AND *P. TREMULA*. Biol. Abstr. 2 : 15669.

165.71

Catalan, G. 1963. [CROSSES WITHIN THE SECTION LEUCE AND A NOTABLE HYBRID BETWEEN LEUCE AND AIGEIOS.] [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63-2b/8, 3 pp. [Span.span.]

168 HISTOLOGY

Barnoud, F. 1956. SUR LA CULTURE DU TISSU CAMBIAL DES *CARPINUS BETULUS* L., *POPULUS TREMULA* L., ET *QUERCUS SESSILIFLORA* SM. [THE CULTURE OF CAMBIAL TISSUE OF *C. BETULUS*, *P. TREMULA* AND *Q. SESSILIFLORA*.] C.R. Acad. Sci., Paris 242(11) : 1508-9. 2 refs. [F.f.]

Cultures of all three have been maintained successfully for about 2 years. The addition of coconut milk stimulated the growth of *C. betulus* cultures but had little effect on cultures of aspen and none on those of oak.

Jacquot, C. 1956. SUR LES BESOINS EN AUXINE ET LES CARACTERES MORPHOLOGIQUES EXTERNES DES CULTURES DE TISSU CAMBIAL DE QUELQUES ESPECES D'ARBRES. [THE GROWTH-REGULATOR REQUIREMENTS AND EXTERNAL MORPHOLOGICAL CHARACTERISTICS OF CULTURES OF CAMBIAL TISSUE OF SOME TREES.] C.R. Acad. Sci., Paris 243(5) : 510-2. 2 refs. [F.]

Includes details of the requirements of *Castanea sativa*, *Ulmus campestris*, *Betula verrucosa*, *Tilia parvifolia*, and *Populus tremula*.

———. 1958. RECHERCHES SUR LA RHIZOGENESE CHEZ LE TISSU CAMBIAL DE *POPULUS TREMULA* L. CULTIVE IN VITRO. [RHIZOGENESIS IN CAMBIAL TISSUE OF *P. TREMULA* GROWN IN VITRO.] C.R. Acad. Sci., Paris 247(18) : 1489-92. 3 refs. [F.f.]

In vitro cultures from three aspens from different parts of France showed that the ease of rooting cuttings of a clone is in direct relation to the ease of root formation by cambial tissue. Tissue that does not readily form roots can be stimulated by the proximity of one that does.

Saatcioglu, F. 1956. BOZKAVAK (*POPULUS CANESCENS* SMITH) MELEZINIM SUN'I CAPRAZLAMA METODIYLE ELDE EDILMESI. [ARTIFICIAL PRODUCTION OF *POPULUS CANESCENS* BY CROSSING.] Istanbul Univ. Orm. Fak. Derg. 6(2) : 70-91. 13 refs. [Turk.g.g.] Gives details of the laboratory hybridization and culture of *P. alba* X *P. tremula* and *P. tremula* X *P. alba*, the early nursery growth of which was 20% greater than selfed *P. alba*. Leaves of the two crosses and of pure *P. alba* are illustrated.

Scapotjev, F. L. 1954. NOVYE GIBRIDNYE FORMY OSINY. [NEW HYBRID FORMS OF ASPEN.] Dokl. Akad. Nauk SSSR 97(1) : 161-4. 2 refs. [Russ.]

176.1

Guse. 1891. DESCRIPTION OF *P. TREMULA*. Zeitschr. F. & J. 23 : 60-71.

Jancarik, V. 1957. OCHRANA SEMENACKU OSIKY VE SKOLKACH. [PROTECTING ASPEN SEEDLINGS IN NURSERIES.] Prace Vyzkum. Ust. Lesn. CSR No. 13 : 125-148. 10 refs. [Cz.russ.e.]

Jovanović, B., and Tucovic, A. 1960. TAKSONOMSKA PROUCAVANJA JASIKE (*POPULUS TREMULA* L.) ODNOSNO T.Z.V. BAHOFENOVE TOPOLE NA DELIBLATSKOJ PESCARI. [TAXONOMIC STUDIES ON ASPEN (*P. TREMULA*) WITH REFERENCE TO THE SO-CALLED BACHOFEN POPULAR ON THE DELIBLATO SANDS.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 1 : 5-41. 24 refs. [Serb.serb.g.]

Nilsson. 1932. NOTE ON *P. TREMULA*. Bot. Cur. Lit. 14(15) : 1.

181 MODE OF LIFE, AUTECOLOGY, SILVICULTURAL CHARACTERS OF TREES

Borset, O., and Haugberg, M. 1960. OSPA. [*POPULUS TREMULA*.] Det Norske Skogselkap, Oslo. 176 pp. 6 pp. of refs. [Nor.]

A comprehensive handbook **covering**: its *position in Norwegian forestry*; botanical description; ecology; diseases and injuries; natural and artificial regeneration; tending; increment; properties **and uses of the wood**; felling and **transport; marketing and grading**; economic aspects; and breeding.

Burger, D. 1920. BEITRÄGE ZUR LEBENS- GESCHICHTE DER *POPULUS TREMULA* L. Eidengen, Tech. Hochsch. Zurich. Promotionsarbeit.

Marcet, E. 1954. ASPE UND WEISSPAPPELN, WALDBAULICH UND WIRTSCHAFTLICH WICHTIGE BAUMARTEN DER ZUKUNFT. [ASPEN AND WHITE POPLARS, SPECIES OF SILVICULTURAL AND INDUSTRIAL IMPORTANCE FOR THE FUTURE.] Schweiz. Z. Forstw. 105(8):425-50. 53 refs. [G.f.]

Reviews European **work on** breeding, propagation, and increment of *Populus tremula*, **comparing it** with **other poplars of the section Leuce**, and gives some data on increment and **yield from plots at Zurich**.

Martenot. 1889. *P. TREMULA* IN RUSSIA. Rev. E. & F. 28: 262.

Petrini. 1928. ASPEN IN SWEDEN. Biol. Abstr. 2: 18520.

181.1

Anonymous. 1903. NOTE OF *P. TREMULA* IN EUROPE. Bull. Soc. For. Belg. 10: 104.

Dansereau, P. 1940. EXTENSION AU VALAIS DE L'AIRE DU *POPULUS TREMULA* VAR. FREYNI HERVIER. [EXTENSION OF THE RANGE OF *POPULUS TREMULA* VAR. FREYNI TO VALAIS.] Bull. Soc. Bot. Geneve, Ser. 2(30): 221-9. Bblg. [F.]

Pospisil, J. 1958. ROZSIRENÍ OSÍKY V ČSR. [THE DISTRIBUTION OF *POPULUS TREMULA* IN CZECHOSLOVAKIA.] Sborn. Čsl. Akad. Zemed. (Lesn.) 4(9):761-80. 20 refs. [Cz.russ.g.]

S., E.E. 1948. BLAEOSP FUNDIN Á AUSTURLANDI. [*POPULUS TREMULA* IN EASTERN ICELAND.] Arsr. Skograektarf. Islands 1948: 123-4. [Ice.]

A number of young trees, the tallest ½ m. high, have been found in heavily-grazed birch scrub. This is the 2nd record of *P. tremula* growing naturally in Iceland.

Zachej, S. 1960. PRIRODZENÉ ROZSÍRENÍ OSÍKY (*POPULUS TREMULA* L.) NA SLOVENSKU. [NATURAL DISTRIBUTION OF *P. TREMULA* IN SLOVAKIA.] Ved. Práce Vyskum. Úst. Lesn. Hosp. Bansk. Stiav. No. 1: 179-95. 11 refs. [Slovak.slovak.russ.g.]

181.21

Zehngraff, P. J. 1947. RESPONSE OF YOUNG ASPEN SUCKERS TO OVERHEAD SHADE. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 278, 1 p.

181.3

Langhammer, A. 1962. OSPAS KRAV TIL JORDBUNNEN. [SOIL REQUIREMENTS OF ASPEN.] Norsk Skogbr. 8(11112) : 369.70. [Nor.] Discusses briefly **the type of Norwegian soil** and site **where natural regeneration of aspen might be more profitable than spruce plantations**.

181.312

Smirnov, V. V., and Odínokova, N. S. 1954. GIDROLOGICESKAYA ROL' OSINOVIYH LESOV. [THE HYDROLOGICAL ROLE OF ASPEN WOODS.] Dokl. Akad. Nauk. SSSR 99(5) : 849.52. 10 refs. [Russ.]

181.33

Domanski, W. 1954. SIEDLIŠKO I WZROST OSÍKI. [THE SITE AND GROWTH OF ASPEN.] Las Polski, Warsz. 28(5) : 16-7. [Pol.] **From abstr.** in Prehl. Lesn. Lit. 5(10): 3852. 1954 [Cz.]

181.34

Remezov, N. P., and Bykova, L. N. 1953. POTREBLENIE I KRUGLOVOROT AZOTA I ZOL'NYH ELEMENTOV V OSINNIKAH. [UPTAKE AND CYCLE OF N AND ASH ELEMENTS IN ASPEN STANDS.] Pochvoved. 1953 (8) : 28-41 2 refs. [Russ.]

181.343

Bloomfield, C. 1954. A STUDY OF PODZOLIZATION. V. THE MOBILIZATION OF IRON AND ALUMINUM BY ASPEN AND ASH LEAVES. J Soil Sci. 5(1):50-6. 10 refs.

181.351'36

Siren, G., and Bergman, F. 1951. SVAMPARNA OCH VARA SKOGSTRAD. [MYCORRHIZAL FUNGI AND OUR FOREST TREES.] Skogsbruken, Helsingfors 21(2) : 39-43. 5 refs. [Sw.]

181.51

Eliasson, L. 1961. THE INFLUENCE OF GROWTH SUBSTANCES ON THE FORMATION OF SHOOTS FROM ASPEN ROOTS. Physiol. Plant., Copenhagen 14(1) : 150-6. 13 refs. [E.e.]

181.52

Al'Benski, A. V. 1940. THE TRANSFORMATION OF ASPEN FROM A DIOECIOUS INTO A MONOECIOUS PLANT. Dokl. Vsesoyuz. Akad. S.-Kh. Nauk 1940(19) : 27-29. [R.]

Sylvén, N. 1942. NÅGRA ORD OM ASPENS HETEROFYLLI. [SOME NOTES ON HETEROPHYLLY IN ASPEN.] Svensk Bot. Tidskr. 36(2/3) : 273-82. Bblg. [Sw.]

181.521

Gorjunova, L. N. 1961. KLON ODNODOMNOJ OSINY *POPULUS TREMULA* L. NA KOL'SKOM POLUOSTROVE. [A MONOECIOUS CLONE OF *P. TREMULA* IN THE KOLA PENINSULA.] Bot. Z. 46(5) : 705-7. 5 refs. [Russ.]

Describes **the discovery of the clone, which consists of 53 trees 30-35 years old, in the Murmansk region. Experiments** showed that protogyny occurred in **the monoecious flowers of androgynous catkins**.

Gramuglio, G. 1962(1963). [THE SEXUAL BEHAVIOR OF *POPULUS TREMULA* IN ITALY.] G. Bot. Ital. 69(1/3) : 78-90. 11 refs. [It.ite.]

Lazarevic, Z., and Korac, M. 1958. 'O POJAVI POLIGAMIJE KOD *POPULUS TREMULA*. [A CASE OF POLYGAMY IN *P. TREMULA*.] Sumarstvo 11(1/2) : 66-8. 7 refs. [Serb.]

Cites an example of *P. tremula* growing in a private garden in Belgrade, on which, in addition to ♀ catkins, ♂ flowers were found.

Pettersson, B. 1950. AN EXPERIMENTAL INVESTIGATION OF THE DISPERSAL OF MAINLY ANEMOCHOROUS NORDIC PHANEROGAMS. Abstr. Pap., 7th Int. Bot. Cong., Stockh. 2 pp.

Floating capacity in **air and buoyancy in water were determined for the diaspores of a number of species, including *Salix caprea* and *Populus tremula*.**

Ruggeri, C. 1960(1961). QUALCHE OSSERVAZIONE SULLE GEMME DI *POPULUS TREMULA* L. [THE BUDS OF *P. TREMULA*.] Nuovo G. Bot. Ital. (n.s.) 67(3/4) : 610-3. 5 refs. [It.ite.] **Describes a case of monoecism in *P. tremula* buds.**

1963. [OBSERVATIONS IN ANOMALOUS FLOWERS OF *POPULUS TREMULA*.] Bubl. Cent. Sper. Agric. For., Roma 6: 47-56. 10 refs. [It.ite.e.]

1963. OBSERVATIONS ON THE BISEXUAL BEHAVIOR OF A POPULATION OF *POPULUS TREMULA* L. [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63/-1/8. 2 pp. 2 refs.

Runquist, E. W. 1951. ETT FALL AV ANDROGYNA HANGEN HOS *POPULUS TREMULA* L. [A CASE OF ANDROGYNOUS CATKINS ON *P. TREMULA*.] Bot. Notiser 1951(2) : 188-91. 11 refs. [Sw.g.]

Sauer, E. 1954. BEOBACHTUNGEN AN ZWITTRIGEN PAPPELN. [OBSERVATIONS ON ANDROGYNOUS POPLARS.] Z. Forstgenet. 3, 5) : 89-91 6 refs. [G.ge.]

A study of the androgynous flowers of a young *Populus tremula* at Stuttgart. Mentions also made of the occurrence of androgynous flowers on an adult *P. alba* (or possibly *P. alba* × *P. canescens*) and a young *P. candicans*. [Cf. Seitz, 1954, *P. alba* to *P. bachofeni*, 165.41.]

Seitz, F. W. 1952. ZWEI NEUE FUNDE VON ZWITTERIGKEIT BEI DER ASPE. [TWO NEW EXAMPLES OF HERMAPHRODITISM IN ASPEN.] Z. Forstgenet. 1(3) : 70-3. 11 refs. [G.g.]

1952. WEITERE BEOBACHTUNGEN AM ZWITTRIGEN ASPENKLON "ON DILLINGEN (DONAU). [FURTHER OBSERVATIONS ON THE ANDROGYNOUS ASPEN CLONE FROM DILLINGEN (DONAU)] Abstr. in Z. Forstgenet. 2(1) : 22. [G.]

1953. UBER ANOMALE ZWITTERBLUTEN EINES KLONES DER GATTUNG *POPULUS*, SEKTION *LEUCE*. [ANOMALOUS ANDROGYNOUS FLOWERS OF A CLONE OF THE SECTION *LEUCE* OF THE GENUS *POPULUS*.] *Z. Forstgenet.* 2(4): 77-90. 24 refs. [G.g.e.]

181.525

Eliasson, L. 1962. THE RESPONSE OF ASPEN ROOTS TO 3-AMINO-1,2,4-TRIAZOLE. *Physiol. Plant.*, Copenhagen 15(2): 229-38. 29 refs. [E.e.]

1962. RESPONSES OF ASPEN ROOTS TO AUXINS WITH PARTICULAR REGARD TO THE EFFECTS OF CHLORINATED PHENOXY-ACETIC ACIDS. *Physiol. Plant.*, Copenhagen 15(4): 753-63. 31 refs. [E.e.]

1962. UNDER SÖKNINGARBETRAFFANDE ASPENS FYSIOLOGISKA REAKTIONER FÖR SYSTEMISKA HERBICIDER. [STUDIES ON PHYSIOLOGICAL REACTIONS OF ASPEN TO SYSTEMIC HERBICIDES.] K. Skogs- o. LantbrAkad. Tidskr., Stockh. 101(1/2): 202-24. 65 refs. [Sw.e.]

1963. RESPONSES OF ASPEN ROOTS TO AUXIN-TYPE GROWTH SUBSTANCES APPLIED TO THE LEAVES. *Physiol. Plant.*, Copenhagen 16(1): 201-14. 40 refs. [E.e.]

Marjai, Z. 1956. NYARMAG CSIRAZASFIZIOLOGIAI VIZSGALATOK. [GERMINATION-PHYSIOLOGICAL INVESTIGATIONS ON POPLAR SEEDS.] Erdesz. Kutatas., Budapest 1956(3): 95-109. 13 refs. [Hu.russ. e.g.]

Smirnov, V. N., Griskun, E. V., and Usynina, V. A. 1962. [THE PHYSICO-CHEMICAL AND BIOCHEMICAL CHARACTERISTICS OF SOD-PODZOLIC SOILS OF THE RHIZOSPHERE OF PINE, SPRUCE, AND ASPEN.] Lesn. Z., Arhangel'sk 5(6): 3-8. 16 refs. [Russ.] Compares in tables the properties of the rhizosphere and non-rhizosphere soil under *Pinus sylvestria*, *Picea abies*, and *Populus tremula*.

Volger, c. 1961. [REMARKABLE EFFECTS OF SOME SOIL STERILIZERS ON THE RAISING OF *POPULUS TREMULA*.] Meded. Landb-Hogesch. Gent 26(3): 1385-93. 6 refs. [G.]

181.6

Borset, O. 1957. VEKSTEN HOS HAN- OG HUNTRÆR A' OSP. [GROWTH OF MALE AND FEMALE ASPEN.] Medd. Norske Skogforsksv. 14(48): 175-85. 12 refs. [Nor.e.]

Female trees, on a plot in southern Norway grew faster in height and diameter in 1944-52 than male trees. However, it seems probable that each sex is represented by only one clone, and other experiments in seedling plantations should be made. Literature or growth of other dioecious species is discussed.

Turesson, G. 1961. HABITAT MODIFICATIONS IN SOME WIDESPREAD PLANT SPECIES. Bot. Notiser 114(4): 435-52. 30 refs. [E.e.] Describes some modifications in growth habit taking place in dwarf forms of *Populus tremula*, *Sorbus aucuparia*, and *Juniperus communis* (among other species), when transplanted to the Botanical-Genetics Garden of the Royal Agricultural College at Uppsala.

181.69

Fedorov, M. A. 1955. INTERESNYI SLUCAI SRASTANIJA DUBA S OSINOI. [AN INTERESTING CASE OF NATURAL STEM-GRAFTING BETWEEN OAK AND ASPEN.] Priroda, Moskva 44(5): 114-5. [Russ.] Describes apparent natural grafting at three points on the stems of an oak and an aspen of coppice and sucker origin respectively. No anatomical study has been made of the tissues at the "unions," but an attempt is to be made to prove true grafting by using tracer atoms.

181.71

Ausland, T. 1957. STORE OSPEER. [LARGE ASPENS.] Norsk Skogbr. 3(22): 597, 609. [Nor.] Three trees, the tallest examples recorded in Norway, have measured heights of 31.74, 31.16, and nearly 30 m., and d.b.h. of 42.6, 41.7, and 46.3 cm. respectively. The green crown in all three occupies about half the stem height. The trees are ca. 60 years old.

182 SYNECOLOGY. PLANT SOCIOLOGY

Tjurin. 1931. DEVELOPMENT OF ASPEN STANDS IN RUSSIA. Allg. Forst-u. Jagdztg. 107: 59.

182.21

Smirnov, V. V. 1959. PROISHOZHDENIE, RAZVITIE I SMENA POKOLENIJ OSINNIKOV V NAGORNYYH DUBRAVAH JUZNOJ LESOSTEPI. [ORIGIN. DEVELOPMENT, AND SUCCESSION OF ASPEN STANDS IN UPLAND OAK FORESTS OF THE SOUTHERN FOREST-STEPPE ZONE.] Soobsch. Inst. Les. No. 11: 51-70. 20 refs. [Russ.] [Cf. Smirnov, 1959, P. tremula, 231.5.]

182.3

Eklund. 1925. INVESTIGATIONS IN ASPEN FORESTS OF SWEDEN. Forstl. Jahresb., p. 215.

— and Wenmark. 1925. SOME INVESTIGATIONS IN ASPEN Svenska Skogsv. Foren. Tidskr. 23: 80-104, 125-42.

— and Wenmark. 1925. SOME INVESTIGATIONS IN ASPEN FORESTS. Bot. Abstr. 14: 1171.

Vlymen, V. P., van. 1949. ASPEN GROVE TYPE (1921 BURN). IROQUOIS FALLS, ONTARIO. Pulp Paper Mag. Can. 50(12): 130, 132, 134.

187 VEGETATION TYPES

Ipatov, v. s. 1960. TIPY OSINOVYH LESOV SEVEROZAPADARSFSR. [POPULUS TREMULA FOREST TYPES IN THE N.W. OF THE R.S.F.S.R.] Vestnik Leningradskogo Universiteta (Serija Biologii) 15(3) No. 1: 23-40. [Russ.e.]

Describes nine types in the Leningrad, Pskov, and Novgorod regions, characterized by: *Calamagrostis lanceolata*; *Filipendula ulmaria*; 'herbae magnae'; 'herbae nemorales'; *Oxalis acetosella*; *C. arundinacea*; *Vaccinium myrtillus*; *V. vitis-idaea*/Sphagnum; *C. arundinacea* (dry type).

Ivanov, V. V. 1952. OSINOVAJA ROSCA V PRIKASPII STEP'JAH. [AN ASPEN WOOD [NEAR BEL'-AGACH] IN THE CASPIAN STEPPES [W. KAZAKHSTAN].] Priroda, Moskva 41(2): 110-1. 1 ref. [Russ.]

2 SILVICULTURE

Barth, A. 1942. ASPEN. DENS KULTUROG BEHANDLING FOR KVALITETSPRODUKSJON. [ASPEN [POPULUS TREMULA], ITS CULTIVATION AND TREATMENT FOR THE PRODUCTION OF HIGH-GRADE TIMBER.] Publ. Ingenior F.H. Frolichs Fond for Aspskogbruks Fremme No. 1, 87 pp. Bblg. [Nor.]

Blumenthal, B. -E. 1942. STUDIER ANGAENDE ASPENS FOREKOMST OCH EGENSKAPER I FINLAND. [STUDIES ON THE OCCURRENCE AND PROPERTIES OF ASPEN IN FINLAND [WITH SPECIAL REFERENCE TO INCREMENT. LENGTH OF CLEAR BOLE, BARK THICKNESS, ROT DAMAGE AND ITS AVOIDANCE BY SILVICULTURAL MEASURES].] Silva Fenn No 56, 63 pp Bblg. [Sw.g.]

Borset, O. 1960. SILVICULTURE OF ASPEN. Scot. For. 14(2): 68-80.

Summarizes the results of Norwegian research aiming at producing high quality aspen (*Populus tremula*) for matchstock.

Hofmann. 1902. CULTIVATION OF ASPEN. Forstwiss. Cbl. 24: 360.

Johnsson, H. 1948. ETT PAR TIDNINGSURKLIPP OM JATTEASP. [TWO NEWSPAPER CUTTINGS ON THE GIANT ASPEN.] Skogen 35(9): 107. 4 refs. [Sw.]

Largerberg. 1923. ASPEN CULTURE IN SWEDEN (EXTRACT). J. For. 21: 627.

Pablo. 1936. THE SILVICULTURAL VALUE OF THE ASPEN. Skogen 23(12): 239-41. [Sw.]

Perdrizet, G. 1948. CONTRIBUTION A LA MONOGRAPHIE DU PEUPLIER TREMBLE-SA REPARTITION SYLVICOLE ET COMMERCIALE EN FRANCE. [CONTRIBUTION TO A MONOGRAPH ON ASPEN-ITS SILVICULTURAL AND COMMERCIAL DISTRIBUTION IN FRANCE.] Rev. Bois Appl. 3(1): 12-4. [F.]

Petrini, S. 1944.45. TRE FORSOKSYTOR I ASPSKOG. [THREE SAMPLE PLOTS IN ASPEN WOODS.] Medd. Skogsforsoksanst. Stockh. 34: 309-25. [Sw.sw.e.]

Schotte. 1917. SEVEN EXPERIMENTAL PLOTS OF ASPEN. Med. Stat. Skogsforsoksanstalt (Sweden) 2(13-14): 1205-20. [Fr. smry. on p. 9.]

Silvy-Leligois, P. 1949. OBSERVATIONS SUR LE TREMBLE EN MAURIENNE. [NOTES ON THE ASPEN IN MAURIENNE(SAVOIE).] Rev. For. Franc. No. 8: 362-70. 16 refs. [F.]

Vill. 1934. DERANBAUDER ASPE. [THE CULTIVATION OF ASPEN.] Dtsch. Forstbeamte 2: 235-6. Forstl. Rundschau 7: 133. 1934. [G.]

222.1

Cointat, M. 1951. LE TREMBLE DANS LA FORET DUDER. [POPULUS TREMULA IN THE FOREST OF DER (HAUT HARNE).] Rev. For. Franc. 1951(12): 759-62. [F.]

Aspen was favored as a standard over coppice in the 19th century, but its place was later taken by lime and later by birch. A comparison is made between increment of aspen on marls and on calcareous soils.

228 CONSTITUTION AND COMPOSITION OF STANDS; FORMS OF STAND

Wijkstrom, S. 1945. GYNNA ASPEN PA LAMPLIGA MARKER. [FAVOR ASPEN ON SUITABLE SITES!] Skogsagaren 21(3; 4): 42-4; 63-6. [Sw.]

Brief semi-popular article on aspen-growing for the match industry.

228.0

Kaldy, J. 1962. [THE ROLE OF ASPEN IN THE INCREASE OF WOOD PRODUCTION OF OUR FORESTS.] Erdcszettud. Kozl., Sopron 1962 (1): 97-120. 10 refs. [Hu.hu.russ.g.]

228.125

Gevorkiantz, S. R., Rudolf, P. O., and Zehngraft, P. J. 1943. A TREE CLASSIFICATION FOR ASPEN, JACK PINE, AND SECOND-GROWTH RED PINE. J. For. 41(4): 268-74. Bblg.

228.3

Smirnov, N. T., and Rjzanova, L. V. 1961. OSINOVO-LIPOVYE NASAZDENIJA LESOSTEPNOGO PRAVOBEREZ JA SARATOVSKOJ OBLASTI I PUTI IHLUCSENIJA. [ASPEN/LIME STANDS IN THE FOREST-STEPPE OF THE SARATOV REGION, AND WAYS OF IMPROVING THEM.] Lesn. Z. Arhangel'sk 4(3): 37-42. 6 refs. [Russ.] Presents stand measurements (b.a., height, volume, increment, and extent of decay) and makes recommendations on management.

23 REGENERATION AND FORMATION OF STANDS

Gese, E. C., and Shadle, A. R. 1943. REFORESTATION OF ASPEN AFTER COMPLETE CUTTING BY BEAVERS. J. Wildlife Mgmt. 7(2): 223-8. Bblg.

231 NATURAL REGENERATION

Borset, O. 1950. PROFERYAGELUE A" ASP "ED NATURLIG BESANING. [REGENERATION OF ASPEN BY NATURAL SEEDING.] Tidsskr. Skogbr. 58(1/3): 8-13. 4 refs. [Nor.]

Describes three examples of natural regeneration by seeding in 1948. In one area, there were 110 seedlings in a square 50 x 50 cm.

231.5

Borset, O. 1956. ROTSKUDDHOS OSP. [ASPEN SUCKERS.] Tidsskr. Skogbr. 64(4): 219-40. 15 refs. [Nor.e.]

Guscini, I. I. 1959. NEKOTORYE DANNYE O VOZNIKNOVENII I OTPADE POROSLEVYH RASTENIJ OSINY. [SOME DATA ON THE PRODUCTION AND MORTALITY OF ASPEN SUCKERS.] Lesn. Z., Arhangel'sk 2(5): 35-7. [Russ.]

Smirnov, V. V. 1959. VEGETATIVNOE RAZMNOZENIE OSINY V NAG-ORNOJ CASTI TELLERMANOVSKOJ ROSCI. [VEGETATIVE REGENERATION OF ASPEN IN THE UPLAND PART OF THE TELLERMAN FOREST.] Trud. Inst. Les. No. 40: 5-52. 44 refs. [Russ.russ.]

232 ARTIFICIAL REGENERATION

Johnsson, H. 1942. GENERATIV OCH VEGETATIV FOROKNING A" POPULUS TREMULA. [SEXUAL AND VEGETATIVE PROPAGATION OF POPULUS TREMULA.] Svensk Bot. Tidskr. 36(2/3): 177-99. Bblg. [Sw.]

232.1

Baranski, S. 1954. HODOWLA SADZONEK OSIKI W SZKOLCO PODSI-AKOWEJ [PODCIEKOWEJ]. [REARING ASPEN PLANTS IN AN IRRIGATED NURSERY.] Las Polski, Warsz. 28(5): 10-2. [Pol.] From abstr. in Prehl. Lesn. Lit. 5(9): 3541. 1954. [Cz.]

Billik, R. 1954. MOJE DOSWIADZENIE Z ZAKRESU POZYSKIWANIA NASION I HODOWLI SADZONEK OSIKI. [MY EXPERIENCE IN HARVESTING THE SEED AND REARING PLANTS OF POPULUS TREMULA.] Las Polski, Warsz. 28(5): 1-10. [Pol.] From abstr. in Prehl. Lesn. & it. 5(9): 3560. 1954. [Cz.]

Borset, O. 1954. OSPOFROETSSPIRECVNE. [THE GERMINATIVE CAPACITY OF ASPEN.] Medd. Norske Skogforsoksv. 13(1), (No. 44): 1-44. 13 refs. [Nor.nor.e.]

Fanta, J. 1955. POLSKE ZKUSENOSTI S PESTOVANIM OSIKY VE SKOLKACH. [POLISH EXPERIENCE IN REARING POPULUS TREMULA IN NURSERIES.] Lesn. Prace 34(7): 311, 314-6. [Cz.]

Lotbiniere, H. G. J. de. 1935. ASPEN POPLAR (POPULUS TREMULA): MOST SUITABLE VARIETIES TO PLANT. Quart. J. For. 29: 19-25.

Marcel, E. 1957. ZUR AUFBEWAHRUNG "ON ASPENSAMEN. [STORING ASPEN SEEDS.] Schweiz. Z. Forstw. 108(4/5): 270-3. 7 refs. [G.f.]

Seed from a 25-year-old aspen was stored in a partial vacuum (25 mm. Hg) at 2-3° C., (1) with, and (2) without seed-coat, and tested (a) for germinative capacity and (b) ability to reach the pricking-out stage (development of primary leaf). After 2 years (a) was still 98% for (1), 79% for (2), while (b) was 79 and 60% respectively. Controls stored at room temperature had lost all viability after 6 months, though (2) kept a little better than (1). The importance of (b) as a criterion is stressed.

Mathey. 1925. ON P. TREMULA IN FRANCE. Bull. Corn. For., Paris 28: 351.

Munch, E. [Ed. Huber, B.] [1949?] BEITRAGE ZUR FORSTPFLANZENZUCHTUNG. VERSUCHE EINER AUSLESEZUCHTUNG DURCH EINZELSTAMM-ABSAATEN BEI FICHTE. WEITERE BEITRAGE ZUR FORSTPFLANZENZUCHTUNG AUS DEM WISSENSCHAFTLICHEN NACHLASS "ON UNIV.-PROF. DR. ERNST MUNCH. [CONTRIBUTIONS TO FOREST TREE BREEDING SELECTION TRIALS OF PROGENY OF INDIVIDUAL SPRUCE TREES. FURTHER CONTRIBUTIONS TO FOREST TREE BREEDING FROM THE PAPERS OF THE LATE DR. E. MUNCH.] Bayerischer Landwirtschaftsverlag G.M.B.H., Munich. 116 pp. [G.]

Pospisil, J. 1951. JAK ZISKAME CISTE OSIKOVE SEMENO. [HOW TO OBTAIN CLEAN ASPEN SEEDS.] Csl. Les. 31(18): 593.4. [Cz.]

Schonbach, H. 1961. ERGEBNISSE EINES ANBAUVERSUCHES MIT ASPE (POPULUS TREMULA L.) AUF GLEYARTIGEM BODEN. [RESULTS OF A CULTIVATION TRIAL WITH P. TREMULA ON A PSEUDOGLEY SOIL.] Arch. Forstw. 10(2): 150-70. 3 refs. [G.g.russ.e.]

232.13

Barnes, B. V. 1958. ERSTE AUFNAHME EINES SECHSJAHRIGEN BESTANDES "ON ASPENHYBRIDEN. [PRELIMINARY DATA FROM A B-YEAR-OLD STAND OF ASPEN HYBRIDS.] Silvae Genet. 7(3): 98.102. 14 refs. [G.g.e.f.]

Flordh, S. 1954. STUDIER A" NAGRAF₂-POPULATIONER AV HYBRID-ASP. [STUDIES ON SOME F₂ POPULATIONS OF HYBRID ASPEN.] Svenska Skogsv. Foren. Tidskr. 52(3): 287-98. 6 refs. [Sw.]

Haugberg, M. 1954. NOEN RESULTATER FRA AVKOMMFORSOK MED ASP. [SOME RESULTS OF PROGENY TRIALS WITH ASPEN.] Norsk Skogind. 8(5):180-5. 3 refs. [Nor.nor.e.]

Johnsson, H. 1952. HYBRIDASPEN OCH DESS ODLING. [POPULUS TREMULA X TREMULOIDES AND ITS CULTIVATION.] Skogen 39(3/3):68-70. [Sw.]

Gives figures showing its height *growth*, and discusses *soil requirements*, planting distances, growth when planted in mixed stands with spruce and regeneration from root suckers.

1953. HYBRIDASPENS UNGDOMSUTVECKLING OCH ETT FORSOK TILL FRAMTIDSPROGNOS. [THE EARLY DEVELOPMENT OF HYBRID ASPEN AND AN ATTEMPT TO PREDICT ITS FURTHER GROWTH.] Svenska SkogsvForen. Tidskr. 51(1):73-96. 11 refs. [Sw.]

1957. AKTUELLT OM HYBRIDASP. [POPULUS TREMULA X P. TREMULOIDES TODAY.] Skogen 44(24):798, 801. [Sw.]

Oskarsson, O. 1962. KOKEMUKSIA HYBRIDIHAAVAN VILJELYSTA. [EXPERIENCE WITH HYBRID ASPEN.] Metsat. Aikak. 1962 (5/6):205-7, 198. 3 refs. [Fie.]

232.3

Graumann, 1933. OBSERVATIONS AND EXPERIENCE WITH ASPEN SEEDS. Dtsch. Forstw. 15: 9-11.

Gray, W. G. 1949. THE RAISING OF ASPEN FROM SEED. For. Rec. For. Comm., Lond. No. 2, 7 pp.

Oldenburg, K. 1934. UPPDRAGANDE AV ASPPLANTOR FRAN FRO. [RAISING ASPEN FROM SEED.] Skogen 21: 57, 67. [Sw.]

232.312

Wettstein, W. 1936. EXTRACTION OF ASPEN SEED. Forstwiss. Cbl. 53(21):727-731. [G.]

232.32

Jirkovsky, V. 1954. ZKUSENOSTI S PESTOVANIM OSIKY ZE SEMENE. [RAISING ASPEN FROM SEED.] Lesn. Prace 33(7):305-10. [Cz.]

Reim, 1930. RESEARCH PROPAGATION OF ASPEN IN FINLAND AND ESTONIA. Tartu For. Publ. (Estonia) 1.6. [G.]

Wettstein, 1931. PROPAGATION OF P. TREMULA AND OTHER SPECIES. Dtsch. Forstw. 13: 51.

232.323

Budke, A. 1952. SKUSENOSTI S PESTOVANIM OSIKOVYCH A BREZOVYCH SADENIC. [EXPERIENCE WITH THE REARING OF ASPEN AND BIRCH PLANTS.] Pol'ana 8(5):80-1. [Slovak.]

Nemec, A. 1950. PESTOVANIE OSIKY ZO SEMENA. [RAISING ASPEN FROM SEED.] Pol'ana 6(12):267-9. [Slovak.]

232.323.7

Marcet, E. 1954. UN PROCEDE POUR MIEUX REUSSIR LES SEMIS DE TREMBLE. [AN IMPROVED METHOD OF SOWING ASPEN [POPULUS TREMULA] SEED.] Schweiz. Z. Forstw. 105(11):621-5. [F.g.]

232.325.2

Wolak, J. 1954. OBERWACJE NAD CHWASTAMI SZKOLKI OSIKOWEJ. [OBSERVATIONS ON WEEDS IN AN ASPEN NURSERY.] Sylwan 98(2):144-8. 7 refs. [Pol.]

The weed species in an aspen nursery in Poland are listed and their effects on the seedling growth described. In unweeded soil the root system of seedlings is found at a greater depth than in weeded soil.

232.328

Frohlich, H. J. 1957. DIE VEGETATIVE VERMEHRUNG VON ASPE UND GRAUPAPPEL UND IHRE BEDEUTUNG FUR DEN WALDBAU. [VEGETATIVE PROPAGATION OF ASPEN AND GREY POPLAR AND ITS IMPORTANCE FOR SILVICULTURE.] Allg. Forstzeitschr. 12(14/15):197-8. 3 refs. [G.]

Gullove, F. H. 1943. UBER DIE VEGETATIVE VERMEHRUNG VON POPULUS TREMULA L. [ON THE VEGETATIVE PROPAGATION OF POPULUS TREMULA L.] Zuchter 15(4/6):101-4. Bblg. [G.]

Johnsson, M. 1941. MODERNA METODER FOR STICKLINGSFOROKNING. [MODERN METHODS OF PROPAGATION BY MEANS OF CUTTINGS.] Lustgarden, Stockh. 22. 35 40.

Wettstein, W. von. 1940. DIE VEGETATIVE VERMEHRUNG VON ASPEN (POPULUS TREMULA). [THE VEGETATIVE PROPAGATION OF ASPEN (POPULUS TREMULA).] Zuchter 12: 92-5. Biol. Abstr. 22(9):22272A. 1948.

232.328.1

Gancev, P. 1961. [PROPAGATION OF POPULUS TREMULA FROM DORMANT STEM CUTTINGS.] Gorsko Stopanstvo 17(12):19-20. [Bulg.] From abstr. in Abstr. Bulg. Sci. Lit., Sofia 7(1):206. 1962. [E.]

The cuttings are grafted on to *P. przewalskii* stocks, the point of union being in the ground. This prevents the *P. tremula* cuttings from rotting before they start to root.

Heitmuller, H. -H. 1954. VEGETATIVE VERMEHRUNG UNTER VERWENDUNG VON WUCHSSTOFFEN BEI POPULUS CANESCENS SMITH UND POPULUS TREMULA L. [VEGETATIVE PROPAGATION OF P. CANESCENS AND P. TREMULA WITH THE AID OF GROWTH REGULATORS.] Abstr. in Z. Forstgenet. 3(6):135-6. [G.]

Thummler, K. 1957. UNTERSUCHUNGEN AUR VEGETATIVEN VERMEHRUNG VON POPULUS TREMULA L. DURCH GRUNSTECKLINGE MIT HILFE SYNTHETISCHER WUCHSSTOFFE. [THE PROPAGATION OF P. TREMULA BY SOFT CUTTINGS WITH THE HELP OF GROWTH REGULATORS.] Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin No. 27 (Beitr. Pappelforsch. No. 2): 179-203. 17 refs. [G.g.]

232.328.1/2

Floor, J. 1952. PROEVEN MET VERMEERDERING DOOR ENTSTEKKEN. [TRIALS OF PROPAGATING BY 'X CUTTINGS' [CUTTINGS ASSISTED IN THE ROOTING PERIOD BY SIDE-GRAFTING TO CUTTINGS OF EASY ROOTERS].] Meded., Inst. Veredeling Tuinbouwgewassen, Wageningen No. 40, 26 pp. 11 refs. [Du.e.]

232.328.3

Larsen, C. M. 1943. STIKLINGER AF URTEAGTIGE SKUD PAA RODDER AF BAEVREASP OG GRAAPOPEL. [CUTTINGS FROM HERBACEOUS SHOOTS ON ROOTS OF ASPEN AND GREY POPLAR.] Dansk Skovforen. Tidsskr. 28(3):96-113. Bblg. [Dan.]

Zehngraff, P. J. 1946. SEASON OF CUTTING AFFECTS ASPEN SPROUTING. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 250, 1 p.

232.328.5

Gambi, G. 1959. PROMETTENTE RISULTATO DELL' IMNESTO DEL "POPULUS TREMULA" L. SU "POPULUS ALBA" L. [PROMISING RESULTS FROM THE GRAFTING OF P. TREMULA ON TO P. ALBA.] Monti e Boschi 10(12):623-7. 3 refs. [It.f.e.]

On March 31, 1959, *P. tremula* scions were grafted on to 39 one-year rooted cuttings of *P. alba*. By July 3, 26 of the grafts had taken, with a mean scion shoot length of 1.2 m. Crown grafts were more successful than slit grafts.

Pospisil, J. 1958. O AFINITE MEZI OSIKOU P. TREMULA L. A NEKTERYMI DALSIMI JEDINCI RODU POPULUS. [ON THE AFFINITY BETWEEN POPULUS TREMULA AND SOME OTHER REPRESENTATIVES OF THE GENUS POPULUS.] Sborn. Csl. Akad. Zemed. Ved. (Lesn.) 4(11):1005-16. 10 refs. [Cz.cz.russ.e.]

232.329.3

Solymos, R. 1960. A REZGONYAR CSEMETE TERMELES UJ MODSZEREI. [NEW METHODS OF RAISING ASPEN IN THE NURSERY.] Erdo 9(2):68-71. [Hu.russ.g.]

Pricking out seedlings from cold frames at the maturing of the first cotyledon-pair has proved very successful. With two prickings out, plants can reach a mean height of 205 cm. vs. 120-130 cm. for only one, by the following autumn. When held all the year in the cold frame, heights of 180 cm. are reached (against 15-35 cm. in the open).

232.33

Wisniewski, J. 1954. PROBY SIEWU OSIKI W UPRAWACH. [TRIAL SOWING OF ASPEN IN PLANTATIONS.] Las Polski, Warsz. 28(5):12-5. [Pol.]

From abstr. in Prehl. Lesn. Lit. 5(9):3548. 1954. [Cz.]

232.4

Schwerin, v. 1919. PLANTING OF P. TREMULA. Mitt. Dtsch. Dendrol. Ges. 28: 168.

232.43

Domanski, W. 1954. SIEDLSKO I WZROST OSIKI. [THE SITE AND GROWTH OF ASPEN.] Las Polski, Warsz. 28(5): 16-7. [Pol.] From abstr. in Prehl. Lesn. Lit. 5(10): 3852. 1954. [Cz.]

235.2/3

Leibundgut, H., and Kreutzer, K. 1958. UNTERSUCHUNGEN UBER DIE WURZELKONKURRENZ. 1. MITTEILUNG UBER DEN VORWALD. [INVESTIGATIONS ON ROOT COMPETITION. 1. ADVANCE PLANTINGS OF NURSE SPECIES.] Mitt. Schweiz. Anst. Forstl. Versuchsw. 34(5): 361-98. 6 refs. [G.f.it.e.]

235.41

Kaldy, J. 1958. A REZGONYAR CSEMELENEVELESE ES JELENTŐSEGEGYVIDEKIERDEINKBEN. [PLANT PRODUCTION AND THE ROLE OF ASPEN IN OUR MOUNTAIN FORESTS.] Erdo 7(12): 446-55. 9 refs. [Hu.russ.g.]

Recommends *the planting at 4 × 4 m. of aspen in beech and beech/oak stands at the thicket stage for felling later as a catch crop. A method of seed collection and plant raising, successfully followed for 4 years, is described.*

24 TENDING OF STANDS AND TREES

Gevorkiantz, S. R., Rudolf, P. O., and Zehngraff, P. J. 1943. A TREE CLASSIFICATION FOR ASPEN, JACK PINE, AND SECOND-GROWTH RED PINE. J. For. 41(4): 268-74. Bblg.

3 WORK SCIENCE. HARVESTING OF WOOD: LOGGING AND TRANSPORT. FOREST ENGINEERING

32 FELLING AND RELATED OPERATIONS

Ankudinov, A. M. 1944. FAUTNOST' I METODY RATSIONAL'NOY RASKRYAZHEVKI OSINY. [DEFECTS AND METHODS OF RATIONAL CROSS-CUTTING OF ASPEN.] Lesn. Prom. No. 9: 8-12. [Russ.]

332 CLEARING THE FELLING SITE

Sarkov, V. I. 1955. O HIMICESKOM SOSTAVE OTKHOV LESORAZRABOTOK. [CHEMICAL COMPOSITION OF LOGGING WASTE.] Gidrol. Lesohim. Prom. 8(7): 3-5. 3 refs. [Russ.]

4 FOREST INJURIES AND PROTECTION

416.13

Kuster, E. 1952. CECIDOLOGISCHE NOTIZEN. V. UBER DAS ERINEUM VON POPULUS TREMULA. [CECIDOLOGICAL NOTES. V. ERINEUM POPULINUM ON P. TREMULA.] Flora, Jena 139(4): 540-5. 22 refs. [G.] Notes on *the character and formation of galls of E. populinum caused by the activity of Phyllocoptes populi on P. tremula.*

416.3/5

Guscin, I. I. 1959. MORFOLOGICESKIE OSOBENNOSTI OSINOVYH MOLODNJAKOV PORAZENNYH SERDCEVINNOJ GNIL'JU. [MORPHOLOGICAL PECULIARITIES OF YOUNG ASPEN STANDS SUFFERING FROM HEART ROT.] Lesn. Hoz. 12(4): 27-9. [Russ.]

1961. RASPROSTRANENIE KRASNINY PO DREVESINE STVOLIKASEMENNOJ OSINY. [DISTRIBUTION OF RED STAIN IN THE STEM OF ASPEN GROWN FROM SEED.] Lesn. Z., Arhangel'sk 4(5): 47-50. [Russ.]

Mikalaikevicius (Mikalajkevicius), V. 1958. KAI KURIE DREBULINES PINTIES (PHELLINUS TREMULAE BOND. ET BORISS.) BIOLOGIJOS KLAUSIMAI [ON THE BIOLOGY OF P. TREMULAE.] Liet. Misku Ukio Moksl. Tyr. Inst. Darb. No. 3: 187-203. 8 refs. [Lith.russ.]

[U.S.A.: Lake St. For. Exp. Sta.] 1935. TREATMENT OF ASPEN STANDS. U. S. For. Serv. Lake St. For. Exp. Sta., 5 pp.

242 THINNINGS

Bickerstaff, A. 1946. THE EFFECT OF THINNING UPON THE GROWTH AND YIELD OF ASPEN STANDS (FOR 10-YEAR PERIOD AFTER TREATMENT). PROJECT p-19. Silv. Res. Note Dom. For. Serv. No. 80, 25 pp. Bblg.

Sviridova, I. K. 1960. ROL' RUBOK UHODA V POVYSENII PLODRODIIJA LESNYH POCHV. [ROLE OF TENDING OPERATIONS [THINNINGS] IN INCREASING THE FERTILITY OF FOREST SOILS.] POCHOVED. 1960 (4): 68-73. 4 refs. [Russ.russ.e.]

243 OPENING OF THE CANOPY (INCREMENT FELLING, OVERHEAD RELEASE AND IMPROVEMENT FELLINGS)

Lasch et al. 1881. TIME AND METHOD OF REMOVING POPLAR FROM CONIFER CROPS [P. TREMULANS]. Allg. Forst- u. Jagdztg. 57: 316-7.

25 TREATMENT OF DEFECTIVE, DERELICT OR VERY OPEN STANDS

Lefter, R., and Morosanu, O. 1960. INVAZIA PLOPOLUI, O FORMA NOUA DE DEGRADARE A PADURILOR DIN PODISUL SUCEVEI SI REFACEREA LOR. [THE ASPEN INVASION, A NEW FORM OF DEGRADATION IN THE FORESTS OF THE SUCEVEI PLATEAU, AND METHODS OF RESTORING THEM.] Rev. Padurilor 75(3): 145-9. 10 refs. [Rum.russ.g.f.e.]

34 STORAGE OF WOOD IN THE FOREST AND AT LOG DUMPS ("LANDINGS")

Hakkila, P. 1962. [ON THE SEASONING AND DECAY OF ASPEN PULPWOOD PREPARED IN SUMMERTIME.] Commun. Inst. For. Fenn. 54 (6). 34 pp. 13 refs. [F.i.e.] (Pienpuualan Toimikunnan Julkaisu No. 137.)

Aspen pulpwood was prepared monthly between July 1959 and Aug. 1960, and stacked for storage. *Results show that barked and unbarked pulpwood keep equally well if stored for one or two summers, but barked wood keeps better by the third summer. Strip-barking and splitting gave increased decay. The durability of unbarked pulpwood increased with increasing length of bolt.*

1959. LOZNYJ OSINOVYJ TRUTOVIK v LESAH LITOVSKOJ SSR I NEKOTORYE EGO BIOLOGICESKIE OSOBENNOSTI. [PHELLINUS TREMULAE IN LITHUANIAN FORESTS, AND SOME OF ITS BIOLOGICAL FEATURES.] Dokl. Nauc. Konferencii po Zascite Rastenij, Vilnius 1958: 321-8. 6 refs. [Russ.russ.]

433 SALVAGE AND DISPOSAL OF FIRE-DAMAGED TIMBER

Ankudinov, A. M. 1939. O SERDTSEVINNOJ GNILI OSINY. [ON HEARTWOOD ROT OF ASPEN.] Trud. Vsesoyuz. Nauchno-issledov. Inst. Lesnogo Khoz. 'VNIILKh' No. 2: 75-7. [Russ.]

441 FOREST WEEDS

Eliasson, L. 1963. THE TOXIC EFFECTS OF CHLORINATED PHENOXYACETIC ACIDS ON ASPEN. Physiol. Plant., Copenhagen 16(2): 255-68. 46 refs. [E.e.]

Hartig. 1885. P. TREMULA AS A PEST IN PINE AND LARCH WOODS. Allg. Forst- u. Jagdztg. 61: 326-7.

Lundberg, H. 1952. LOVROJNING MED FLYGPLANEN. [ERADICATING HARDWOODS FROM AIRCRAFT.] Skogen 39(11): 221-2, 234. [Sw.]

443 FUNGI AND BACTERIA

Ankudinov, A. M. 1939. SERDSEVINNAYA GNIL'OSINY I MERY BOR'BY S NEI. [HEARTROT OF ASPEN AND COMBATIVE MEASURES AGAINST IT.] Trud. Vsesoyuz. Nauchno-issledov. Inst. Lesnogo Khoz. 'VNIILKh' No. 7: 3-67. Bblg. [Russ.]

Emilov, V. S. 1939. PRICHINY RAZVITIYA GNILI U OSINY I MERY BOR'BY S NEI. [THE CAUSES OF ROT DEVELOPMENT IN ASPEN AND COMBATIVE MEASURES.] Trud. Vsesoyuz. Nauchno-issledov. Inst. Lesnogo Khoz. 'VNIILKh' No. 7: 69-77. [Russ.]

Jorstad. 1928. DISEASES IN ASPEN. Tidsskr. Skogbr. 36: 436.

[U.K.] 1951. [ASPEN AN ALTERNATIVE HOST TO PINE RUST.] Rep. For. Comm. Lond. 1949-50: 42.

A serious outbreak of *Melampsora pinitorqua* on Scots pine has pointed to the inadvisability of growing this species where *aspen*, the alternative host to the fungus, is present.

443.2

Kozłowska, C. 1961. BADANIA NAD ZWALCZANIEM GRZYBOW WYWOŁUJĄCYCH ZGORZEL SIEWEK SOSNY I OSIKI. CZĘŚĆ II. [INVESTIGATIONS ON THE CONTROL OF FUNGI CAUSING DAMPING-OFF IN SCOTS PINE AND ASPEN SEEDLINGS. PART II.] Prace Inst. Bad. Lesn. No. 212: 39-58. 37 refs. [Pol.russ.e.g.]

443.2/3

Rennerfelt, E. 1953. BIOLOGISCHE UNTERSUCHUNGEN ÜBER DEN KIEFERNDRECHER MELAMPSORA PINITORQUA (BRAUN) ROSTR. [BIOLOGICAL RESEARCH ON M. PINITORQUA.] [Pre-issue] Proc. Congr. Int. Union For. Res. Organ., Rome 1953, Section 24 (1/3). 5 pp. 3 refs. [G.]

443.3

Anderson, R. L., Joranson, P. N., and Einspahr, D. W. 1960. HYPOXYLON CANCER ON EUROPEAN ASPEN. U. S. Dep. Agric. Plant Dis. Repr. 44(2): 132.

Cankers caused by Hypoxylon pruinautum were found on Populus tremula in Wisconsin. This is the first report of this disease on *P. tremula* in N. America or western Europe, though it has been reported from the U.S.S.R. In crossing with native species, *P. tremula* cannot be regarded as a source of resistance to *H. pruinautum*. [From authors' summary.]

Forsslund, K. -H. 1952. ASPBLADSMALEN, EN NY SKADEGORARE PÅ ASP. [DAMAGE TO ASPEN LEAVES BY LEUCOPTERASINUELLA.] Skogen 39(6*/7*):67*. [Sw.]

Ginzburg, M. 1961. BIOLOGIA I SZKODLIWOSC GRZYBA VENTURIA TREMULAE ADERH. WPOLSCIE. [BIOLOGY OF AND DAMAGE CAUSED BY THE FUNGUS V. TREMULAE IN POLAND.] Prace Inst. Bad. Lesn. No. 211: 3-37. 12 refs. [Pol.russ.e.g.]

An account of the biology of *V. tremulae*, and the extent and severity of the damage it causes to leaves and shoots. It is one of the most harmful parasites of aspen in Poland, especially in nurseries.

Hubbes, M. 1960. SYSTEMATISCHE UND PHYSIOLOGISCHE UNTERSUCHUNGEN AN VALSACEEN AUF WEIDEN. [SYSTEMATIC AND PHYSIOLOGICAL STUDIES ON VALSACEAE FROM WILLOWS.] Phytopath. Z. 39(1): 65-93. 50 refs. [G.e.]

Mikalaikevicius, V. 1959. KOVOSPRIEMONESSUCENTRINIUDREBULESPUVINIU. [CONTROL OF HEART ROT IN POPLARS.] Liet. Misku Ukio Moksl. Tyr. Inst. Moksl.-Tech. Inform. Biul. No. 1: 13-4. [Lith.]

Persson, A. 1962. [POPULUSTREMULA × P. TREMULOIDES AND VALSANIVEA.] Skogen 49(24): 458-60. 3 refs. [Sw.]

Symptoms of the disease and its development in the field are described. Repeated experiments failed to establish it on unwounded branches. Inoculations in May or June gave much higher percentages of symptoms than those made later in the year, and those made on thin (3 mm. diam.) than those on thick (12 mm.) branches. Systematic studies begun in 1959 on different progenies of the hybrid have shown considerable variation between them as regards disease resistance.

Persson, E. 1955. KRONENMYKOSE DER HYBRIDASPE. I. UNTERSUCHUNGEN ÜBER AUFTRETEN, SELEKTIVE WIRKUNG UND PATHOGENI-

TAT DES ERREGERS. [FUNGAL DIEBACK IN THE CROWNS OF HYBRID ASPENS. I. RESEARCH ON THE OCCURRENCE, SELECTIVE EFFECT AND PATHOGENICITY OF THE CAUSAL FUNGUS.] Phytopath. Z. 24(1): 55-72. 22 refs. [G.e.]

Pospisil, J. 1958. PROBLÉM ZDRAVOTNIHO STAVU OSIKY. [THE HEALTH OF ASPEN [IN CZECHOSLOVAKIA].] Sborn. Čsl. Akad. Zemed. (Lesn.) 4(10): 831-8. 14 refs. [Cz.cz.russ.g.]

Presents a diagram and table showing the proportion of healthy and diseased aspens in Bohemia, Moravia, and Slovakia. The fungus *Phellinus igniarius f. tremulae* causing heart rot, the most dangerous pathogen on aspen, is not very widespread, and resistant individuals still occur in the forest, although aspen had previously been removed as much as possible. These should be used for large-scale propagation.

Radzijeviskyj, G. G. 1960. MALOVIDOMIGRYBY Z RODNYN POLYPORACEAE NA UKRAJINI. [LITTLE-KNOWN FUNGI OF THE FAMILY POLYPORACEAE IN THE UKRAINE.] Ukr. Bot. Z. 17(2): 107-8. 5 refs. [Ukr.]

Describes finds of *Poriataxicola* on fallen *Pinus sylvestris* twigs, *Trametes trogii* on living *Populus tremula*, and *Polyporus borealis* on rotten *Picea abies* stumps.

451.2

[U.S.S.R.: Soobsc. Inst. Les.] 1959. [ELK AND FORESTRY IN RUSSIA.] Soobsc. Inst. Les. No. 13. 58-110. Many refs. [Russ.]

453 INSECTS

Brammanis, L. 1963. [THE INCIDENCE AND CONTROL OF SAPERDA POPULNEA IN SWEDEN.] Z. Angew. Ent. 51(2): 122-9. 12 refs. [G.e.]

Forsslund, K. -H. 1952. ASPBLADSMALEN, EN NY SKADEGORARE PÅ ASP. [DAMAGE TO ASPEN LEAVES BY LEUCOPTERASINUELLA.] Skogen 39(6*/7*):67*. [Sw.]

Gabel, S. 1961. NEOSCIARA AMOENA WINN. ALS SCHADLING IN ASPENSTECKLINGSZUCHTEN. [N. AMOENA ATTACKING ASPEN CUTTINGS.] Anz. Schadlingsk. 34(6): 91. 3 refs. [G.]

N. amoena was found boring into the cambium of rooted aspen cuttings at the Hessische Forstliche Zuchtungsstation. The cambium and root hairs of rooted larch and birch cuttings were also attacked. Deaths occurred in all three species.

Georgijevic, E., and Vaclav, V. 1960. PRILOG POZNAVANJU STETNIH INSEKATA NA TOPOLAMA NR BOSNE I HERCEGOVINE. [INSECT PESTS OF POPLARS IN BOSNIA AND HERZEGOVINA.] Rad. Istraz. Topola Jugosl. Nac. Kom. Topolu No. 2: 47-53. [Serb.f.]

Kangas, E. 1940. ASPENS AVTORKNING BELYST AV ENTOMOLOGISKE ANALYSER. [ASPEN WILTING EXPLAINED BY ENTOMOLOGICAL INVESTIGATIONS.] Ent. Medd. 22(1): 32-4. Biol. Abstr. 17: 19233.

1941. AGRILUS ATER L. ALS ESPENSCHADLING I N FINLAND. [AGRILUS ATER L. AS A PEST OF ASPEN IN FINLAND.] Z. Angew. Ent. 28(2/3): 359-65. Bblg. [G.] Rev. Appl. Ent. A30: 245-6.

1942. FORSTENTOMOLOGISCHE STUDIEN AN DER ESPE. [FOREST ENTOMOLOGICAL STUDIES ON ASPEN.] Ann. Ent. Fenn. 8(1): 49-71. Bblg. [G.]

1955. BESCHREIBUNG EINER FINNISCHEN XYLETINUSART (COL., ANOBIIDAE). [DESCRIPTION OF A NEW FINNISH SPECIES OF XYLETINUS.] Ann. Ent. Fenn., Helsinki 21(1): 3-5. [G.] The new species, named *X. gronblomi*, is found on *Populus tremula*.

Kudler, J. 1952. HROMADNY SKODLIVY VYSKYT TESARIKA [SAPERDA CARCHARIAS L.] NA OSIKACH NA HRONOVSKU. [MASS OUTBREAK OF S. CARCHARIAS ON ASPENS IN THE HRONOV DISTRICT.] Lesn. Prace 31(3): 122-5. [Cz.]

Nuorteva, P. 1961. PACHYPAPPELLA POPULI (L.) (HOM., PEMPHIGIDAE) AS A PEST OF POPULUSTREMULA (L.) IN FINLAND. Ann. Ent. Fenn., Helsinki 27(3): 123-6. 3 refs. [E.e.]

Describes leaf injuries observed during the hot, dry summer of 1959 at Bromarf, S.W. Finland, mainly on older trees. Not only leaves actually infested but others on the same twigs became discolored and later dropped, defoliation reaching 5-30% from early August onwards.

Pronin, J. 1935. ON THE BIOLOGICAL ROLE OF ASPEN IN FOREST ASSOCIATION. Ochr. Przyr. 15: 90-95. [Pol.g.] Rev. Appl. Ent. 24(11): 677. 1936.

Schefer-Immel, V. 1957. UBER EIN MASSENAUFTRETEN DER ZIKADEIDOCERUS LAMINATUS FLOR. AN POPULUS TREMULA, MIT EINIGEN BEMERKUNGEN ZUR BIOLOGIE UND ZUM HONIGTAU DER ART. [AN OUTBREAK OF I. LAMINATUS ON P. TREMULA, WITH SOME OBSERVATIONS ON THE BIOLOGY OF THE SPECIES AND ON ITS HONEY DEW.] Anz. Schadlingsk. 30(10): 165-9. 19 refs. [G.]

1958. EIN MASSENAUFTRETEN VON KATZCHENSCHADLINGEN AN ASPE (POPULUS TREMULA). [AN OUTBREAK OF CATKIN PESTS ON ASPEN.] Anz. Schadlingsk. 31(1): 7-10. 8 refs. [G.g.]

48 INJURIES DUE TO UNKNOWN OR COMPLEX CAUSES

Boyer, M. G. 1962. A LEAF-SPOTTING DISEASE OF HYBRID AND NATIVE ASPEN. Canad. J. Bot. 40(9): 1237-42. 3 refs.

5 FOREST MENSURATION

524 DETERMINATION OF THE VOLUME OF TREES AND STANDS

Sopp, L. 1961. A REZGONYAR (POPULUS TREMULA L.) FATOMEGES TORZSALAK-VIZSGALATAINAK EREDMENYEI. [WOOD VOLUME AND STEM FORM OF ASPEN.] Erdő 10(7): 292-9. [Hu.russ.g.]

524.3 15

Borset, O. 1954. KUBERINGAVOSP PA ROT. [DETERMINING THE VOLUME OF STANDING ASPEN.] Medd. Norske Skogforsoksv. 12(3) (43): 391-447. 25 refs. [Nor.nor.e.]

Gives volume tables for *P. tremula* in S. Norway based on measurement of 1,262 trees, showing volume. Volume can be found from a separate bark percent table. There is a full English summary and tables and graphs have English legends.

Ilvessalo, Y. 1947. PYSTYPUIDEN KUUTIOIMISTAU LUKOT. [VOLUME TABLES FOR STANDING TIMBER.] Comm. Inst. For. Fenn. 34(4): 1-149. 12 refs. [Fie.]

Rozenberg, V. A. 1952. OB'EMNYE TABLICY DLJA TAKSACII MOLODYH DREVOSTOEV. [VOLUME TABLES FOR YOUNG STANDS.] Lesn. Hoz. 5(6): 70-Z. [Russ.]

Vincent, G., Korsun, F., and Zavadil, Z. 1950. POROSTNI A HMOTOVETABULKY PRO TOPOLY. [YIELD AND VOLUME TABLES FOR POPLAR.] Lesn. Prace 29(5/6): 214-46. 9 refs. [Cz.cz.russ.f.]

525.1

Liogenkij, G. L. 1961. VYHOD BALANSA IZ OSINOVYH DREVOSTOEV. [PULPWOOD YIELD FROM ASPEN STANDS.] Lesn. Hoz. 14(10): 38-41. [Russ.]

Tabulates data on the pulpwood yields (three grades) from various age classes and site types, and on the age of technical maturity, for the aspen stands of the *Vologda* region, with particular reference to the production of sulphite pulp.

526.5

Borset, O. 1952. UNDERSOKELSER OVER OSPETOMMER. [INVESTIGATION ON ASPEN LOGS.] Medd. Norske Skogforsoksv. 11(2) (39): 355-423. 10 refs. [Nor.nor.e.]

531 CROWN DIMENSIONS, CROWN AREA, CROWN VOLUME, CROWN RATIO

Ievin, I. K., and Dikelson, E. O. 1962. MASSA KRONOSINY, BEREZY I ELI V KISLICHNIKAH LATVII. [CROWN WEIGHT OF ASPEN, BIRCH AND SPRUCE IN OXALIS-TYPE STANDS IN LATVIA.] Lesn. Hoz. 15(4): 20-3. [Russ.]

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Avanzo, E. 1961(1962). ANALISI AUXOMETRICA DI UN IMPIANTO DI POPULUS TREMULA L. IN ABRUZZO. [INCREMENT OF A PLANTATION OF P. TREMULA IN THE ABRUZZI.] Pubbl. Cent. Sper. Agric. For., Roma 5: 263-71. 12 refs. [It.ite.e.]

Measurement of a 42-year plantation showed a *m.a.i.u.b.* of 13.4 *cu.m./ha.* Mean height was 25.9 m., and mean *d.b.h.* 31.9 cm. On this basis, ca. 103 years is suggested as the rotation of maximum volume production.

Messeri, A. 1958(1959). APPUNTI SU UNA POPOLAZIONE DI POPULUS TREMULA L. DELLA SILA (CALABRIA). I. ANALISI AUXOMETRICA. [NOTES ON A STAND OF P. TREMULA AT SILA, CALABRIA. I. STEM ANALYSIS.] Pubbl. Cent. Sper. Agric. For., Roma 2: 23-42. 17 refs. [It.ite.e.]

566 YIELD TABLES AND THEIR CONSTRUCTION

Haugberg, M. 1958. PRODUKSJONSOVERSIKTER FOR OSP: FORELOPIG RAPPORT. [YIELD TABLES FOR ASPEN: PRELIMINARY REPORT.] Medd. Norske Skogforsoksv. 15(2) (50): 143-86. 17 refs. [Nor.nor.e.e.]

Presents tables based on material from 35 permanent sample plots for site classes II and III, and ages 18 to 70 years. It is emphasized that they are provisional and subject to correction when more material is available.

Mathiesen, A. 1949. ASPEN STANDS, THEIR GROWTH AND YIELD IN THE EXPERIMENTAL FOREST OF THE UNIVERSITY OF TARTU [ESTONIA]. Apophoreta Tartuensis, Stockh. 1949: 308-17. 13 refs. [E.]

Semeckin, I. V. 1959. HOD ROSTA NA BOLEERAS PROSTRANENNYH ELOVO-LISTVENNYH DREVOSTOE " LENINGRADSKOJ OBLASTI. [YIELD TABLES FOR THE COMMONEST TYPES OF SPRUCE/HARDWOOD STANDS IN THE LENINGRAD REGION.] Lesn. Z., Arhangel'sk 2(5): 24-9. 3 refs. [Russ.]

Vincent, G., Korsun, F., and Zavadil, Z. 1950. POROSTNI A HMOTOVETABULKY PRO TOPOLY. [YIELD AND VOLUME TABLES FOR POPLAR.] Lesn. Prace 29(5/6): 214-46. 9 refs. [Cz.cz.russ.f.]

567 STAND TABLES

Falaleev, E. N., and Danilin, M. A. 1962. [STRUCTURE OF THE POPULUS TREMULA STANDS OF SIBERIA.] Lesn. Hoz. 15(10): 12-4. [Russ.]

P. tremula stands occupy more than 7 million ha. in Siberia. Some data are tabulated on the distribution of stems by diameter classes in stands of different ages.

568 OTHER MENSURATIONAL STUDIES OF STAND CONSTITUTION AND CHANGES THEREIN. DISTRIBUTION OF GROWTH BY TREE CLASSES, ETC.

Tikka, P. S. 1954[1955]. HAAPAMETSIKOIDEN RAKENTEESTA JA LAADUSTA. I. RAKENNE. [STRUCTURE AND QUALITY OF ASPEN STANDS. I. STRUCTURE.] Commun. Inst. For. Fenn. 44(4). 33 pp. 41 refs. [Fie.]

1956. HAAPAMETSIKOIDEN RAKENTEESTA JA LAADUSTA. II. LAATU. [STRUCTURE AND QUALITY OF ASPEN STANDS. II. QUALITY.] Commun. Inst. For. Fenn. 45(3). 54 pp. 26 refs. [Fie.e.]

6 FOREST MANAGEMENT

651.2

Jorgensen, F. 1952. PRISKOBLINGSBEREGNING FOR FYRSTIKVIRKE A" ASP. [PRICE CORRELATION CALCULATION FOR ASPEN MATCH TIMBER.] Medd. Norske Skogforsoksv. 11(3) (40): 569-618. 13 refs. [Nor.nor.e.]

651.71

Borset, O. 1953. OSPESKOGBRUKETS LONNSOMHET. [THE PROFITABILITY OF ASPEN.] Tidsskr. Skogbr. 61(4): 121-32. 10 refs. [Nor.]

On the basis of production figures for aspen in Norway and Sweden and of calculations on price relationships between spruce

and aspen, it is concluded that at present prices in Norway, aspen is as profitable as spruce.

Jorgensen, F. 1956. DE ØKONOMISKE BETINGELSER FOR LOVSKOGBRUKET I AGDERFYLKENE. [THE ECONOMIC CONDITIONS FOR GROWING HARDWOODS IN AGDER COUNTIES.] Norsk Skogbr. 2(22):715-720. 5 refs. [Nor.]

Discusses potential markets and supplies, and estimates the relative profits and expenditure for spruce, aspen, and oak, concluding that aspen on good-quality sites can compete economically with spruce, but that oak is less likely to do so. Very little material for such calculations is, however, available and the results are not considered conclusive.

8 FOREST PRODUCTS AND THEIR UTILIZATION

811 STRUCTURE. IDENTIFICATION

Walek-Czernecka, A. 1952. ANATOMIA POROWNAWCZA DREWNA POPULUS ALBA L., POPULUS TREMULA L., POPULUS CANESCENS SM. [COMPARATIVE WOOD ANATOMY OF P. ALBA, P. TREMULA, AND P. CANESCENS.] Roczn. Dendrol. Polsk. Tow. Bot., Warsz. 8: 1-31. 21 refs. [Pol.russ.f.]

811.1

Hejnowicz, A., and Hejnowicz, Z. 1958. VARIATIONS OF LENGTH OF VESSEL MEMBERS AND FIBRES IN THE TRUNK OF POPULUS TREMULA L. Acta Soc. Bot. Polon. 27(1): 131-59. 32 refs. [E.e.]

811.12

Asunmaa, S. 1955. ELECTRON MICROSCOPE STUDIES ON SECTIONS OF ASPEN SULFITE PULP FIBRES. Svensk PappTidn. 58(2): 33-4. 5 refs. [E.g.sw.e.]

Results are shown in photomicrographs.

Huhrjanskaja, T. P. 1953. VLIJANIE PRESSOVANIIJA NA STRUKTURU DREVESINNY OSINY I SOSNY. [EFFECT OF COMPRESSION ON THE WOOD STRUCTURE OF ASPEN AND PINE.] Trud. Inst. Les. 9: 444-7. X-ray spectra showed that the cellulose structure was the same in both species, and does not change until the volume is reduced by 40%. The cellulose is more orientated in late wood than in early. Compression increases the degree of orientation in pine wood irrespective of direction, while in aspen the change of orientation depends on the direction with regard to the direction of compression.

811.144

Weber, F. 1951. [STONE TYLOSES.] Phytion, Annales Rei Botanicae, Horn, N.-O. 3(1/2):104-7. Transl. by U. von Koeppen and published as Transl. Commonw. Sci. Industr. Res. Organ. Aust. No. 2226. 1954. (Also Oxf. Transl. No. 1101.) Stone tyloses were found around the larval chambers of Saperda populnea in Populus tremula and in vessels of part of a stem of Bauhinia sp.

811.156

Bruun, H. H., and Slungaard, S. 1957. INVESTIGATIONS OF POROUS WOOD AS PULP RAW MATERIAL. 1. FIBRE LENGTHS OF THE SPECIES ALNUS GLUTINOSA (L.) GAERTN., ALNUS INCANA (L.) MOENCH, BETULA ERRUCOSA EHRH. AND POPULUS TREMULA L. Pap. ja Puu 39(11): 521-5. 38 refs. [E.e.fi.sw.g.]

Scaramuzzi, G. 1962. WOOD FIBRE DIMENSIONS OF SOME ITALIAN PROVENANCES OF POPULUS TREMULA. Proc., 13th Congr. Int. Union For. Res. Organ., Vienna 1961, Pt. 2(2), Sect. 41/13. 11 pp. 16 refs. [E.e.]

Presents data on two provenances from Calabria, one from Sicily and one from Abruzzo, with some comparative data from black poplar hybrids. The morphology of the fibres is discussed in a paper-making context and the wood considered suitable for certain uses.

812 PHYSICAL AND MECHANICAL PROPERTIES

Hursudjan, P. A. 1960. FIZIKO-MEHANICESKIE SVOJSTVA DREVESINNY OSINY, PROIZRASTAJUSCEJ V ARMENII. [THE PHYSICAL AND MECHANICAL PROPERTIES OF THE WOOD OF ASPEN GROWING IN ARMENIA.] Izv. Akad. Nauk Armjansk. SSR (Biol. Nauki), Erevan 13(9):51-60. 16 refs. [Russ.arm.]

Gives tabulated data relating to one specimen of Populus tremula.

Jukna, A. D., and Tyltins, K. K. 1956. FIZIKO-MEHANICESKIE SVOJSTVA OSINY (POPULUS TREMULA L.) PROIZRASTAJUSCEJ V USLOVIJAH LATVIJSKOJ SSR. [PHYSICAL AND MECHANICAL PROPERTIES OF P. TREMULA GROWING IN LATVIA.] Trud. Inst. Lesohoz. Probl., Riga No. 10: 47-59. 13 refs. [Russ.russ.]

Tabulated in detail.

Kaldy, J. 1962. [DATA ON THE MECHANICAL AND PHYSICAL PROPERTIES OF POPULUS TREMULA.] Erdeszettud. Kozl., Sopron 1962 (2): 59-88. 8 refs. [Hu.russ.e.g.]

Lenz, O. 1956. LE BOIS DES PRINCIPAUX PEUPLIERS ET D'UN SAULE INDIGENES EN SUISSE. [THE WOOD OF THE CHIEF POPLARS AND OF A WILLOW NATIVE TO SWITZERLAND.] Mitt. Schweiz. Anst. Forstl. Versuchsw. 32(5):203-27. 12 refs. [F.f.g.it.e.]

812.21

Curro, P. 1957. PHYSICAL CHARACTERISTICS OF THE WOOD OF POPULUS X EURAMERICANA (DODE) GUINIER '154' AND OF POPULUS TREMULA L. [Docum.] Int. Poplar Comm., 5th Sess. Wkg. Party on Exploitation and Utilization, Paris 1957 No. FAO/CIP/UT-2, 12 pp. 2 refs. [E.]

812.35

Callin, G. 1948. OM FLOTTNING AV BJORK OCH AS P. [THE FLOATING OF BIRCH AND ASPEN.] Norrlands SkogsvForb. Tidskr. 1948 (4): 321-79. 9 refs. [Sw.]

Tuovinen, A. 1961. KUORELLISTEN KOIVUPAPERIPUUNIPPUJEN UNIMISKYVYSTÄ. [THE BUOYANCY OF BUNDLES OF UNBARKED BIRCH PULPWOOD.] Tied., Metsäteho, Helsinki No. 188, 29 pp. 2 refs. [F.i.e.e.]

812.7

Jalava, M. 1945. SUOMALAISEN MANNYN, KUUSEN, KOIVUN JA HAAVAN LUJUUSOMINAISUUKSISTA. [STRENGTH PROPERTIES OF FINNISH PINE, SPRUCE, BIRCH, AND ASPEN.] Comm. Inst. For. Fenn. 33 (3): 1-66. [F.i.e.]

Venet, J. 1955. ESSAIS SUR LA RESISTANCE MECANIQUE DU BOIS DE PEUPLIER FAITS AU LABORATOIRE DE TECHNOLOGIE DE L'ECOLE NATIONALE DES EAUX ET FORETS. [TESTS OF THE MECHANICAL STRENGTH OF POPLAR WOOD MADE AT THE ECOLE DES EAUX ET FORETS. NANCY.] Annexe to [Pap.] 8th Sess. Int. Poplar Comm., Madrid 1955 No. FAO/CIP/75-B, pp. 9-12. [F.]

Gives the results of tests on P. deltoides ("carolinensis"), P. regenerata, and P. tremula.

813.1

Aaltio, E. 1958. INVESTIGATIONS ON THE MODE OF COMBINATION OF LIGNIN IN WOOD, WITH SPECIAL REFERENCE TO ASPEN (POPULUS TREMULA) WOOD. Ann. Acad. Scientiarum Fennicae, Helsinki (Ser. A. II) No. 88, 58 pp. 92 refs. [E.e.]

813.1.1

Aaltio, E., and Roschier, R. H. 1954. LIGNININ KEMIALLINEN SITOUTUMINEN HAAPAPUUSKA FUSKUROITUJEN BUTANOLI-VESIKEITTOJEN VALOSSA. [THE CHEMICAL COMBINATION OF LIGNIN IN ASPEN WOOD WITH REFERENCE TO BUFFERED BUTANOL/WATER COOKS.] Pap. ja Puu 36(4a): 157-74. 41 refs. [Fie.]

Holmberg, B. 1947. ESPENHOLZER UND MERCAPTOSAUREN. (LIGNINUNTERSUCHUNGEN, XVII). [ASPEN WOODS AND MERCAPTO ACIDS. (LIGNIN RESEARCH, XVII).] Arkiv. For. Kemi, Mineralogi Och Geologi, Stockh. 24a(29): 1-11. 9 refs. [G.g.]

Larsson, A. 1943. SULPHITE WASTE LIQUORS. V. LIGNOSULFONIC ACIDS FROM WASTE LIQUORS OF SULFITE CORKS OF ASPEN WOOD. Svensk PappTidn. 46: 93-100. [G.] Chem. Abstr. 37: 3266.

Smith, D.C.C. 1955. P-HYDROXYBENZOATE GROUPS IN THE LIGNIN OF ASPEN (POPULUS TREMULA). J. Chem. Soc., July, pp. 2347-51. The lignin contains p-hydroxybenzoate groups. They occur singly, involving *aliphatic hydroxyl* groups of the *native lignin* and account for about 10% of its weight. [From *author's summary*.]

813.15

Schoettler, J.R. 1954. THE ALKALI RESISTANCE OF THE PENTOSANS IN ASPENWOOD. Tappi 37(12): 686-94. 27 refs.

813.2

Larsson, S. E., and Selleby, L. 1960. ASPEN WOOD CONSTITUENTS. Svensk PappTidn. 63(18): 606-8. 7 refs. [E.e.sw.g.]

Perila, O. 1955. INVESTIGATIONS ON THE ETHERAL EXTRACT OF ASPEN WOOD (POPULUS TREMULA). Suomen Kemistilehti, Helsinki 28B(3): 109-10. 4 refs. [E.]

The following were tentatively identified: a *sitosterol* glucoside, *cerotic (hexacosanoic) acid*, and *lignoserie (tetracosanoic) acid*.

1956. SATURATED FATTY ACIDS OF STEM CELLS OF BIRCH (BETULA VERRUCOSA) AND ASPEN (POPULUS TREMULA). Ann. Acad. Scientiarum Fennicae, Helsinki (Ser. A II), No. 76, 49 pp. 88 refs. [E.e.]

Reviews literature on saturated *fatty acids* in other woods and on methods of analysis, and gives *photomicrographs* of sections showing the location of *extractives* soluble in diethyl *ether as such* but insoluble in diethyl ether as bismuth salts, mainly in the *medullary* rays of both species.

Wienhaus, H. 1953. EXTRAKTSTOFFE AUS ASPENHOLZ "ON POPULUS TREMULA. [EXTRACTIVES FROM THE WOOD OF P. TREMULA.] Chem. Technik, Berlin 5(1): 24. [G.] Analysis of the C_6H_6 and CH_3OH extracts of aspen sawdust showed that aspenwood contains a *fatty oil* resembling linseed *oil*, and *extractives* similar to tannins and *phlobaphenes* and containing free and combined sugars.

813.3

Weber. 1895. ASH ANALYSIS OF WOOD AND BARK OF P. TREMULATA. Allg. Forst- u. Jagdztg. 2: 209-19.

815 EFFECT OF GROWTH FACTORS ON STRUCTURE AND PROPERTIES

Savina, A.V. 1939. VLIYANIE RUBOK UKHODA NA STROENIE DREVESINY OSINY. [INFLUENCE OF THINNING ON THE WOOD STRUCTURE OF ASPEN.] Trud. Vsesoyuz. Nauchno-issledov. Inst. Lesnogo Khoz. 'VNIILKh' No. 2: 56-68.

Translation by D. Armstrong, Inform. Serv., Council for Sci. and Indus. Res., Melbourne. 16 pp.

83 TIMBER MANUFACTURING INDUSTRIES AND PRODUCTS

Jakowleff. 1932. UTILIZATION OF ASPEN TIMBER DAMAGED BY WOOD ROT. Forstl. Rundschau 5 178.

83/86

Polubojarinov, O. I., and Civiksin, L. E. 1962. [THE UTILIZATION OF DEFECTIVE ASPEN.] Lesn. Prom. 1962(10): 21-2. 2 refs. [Russ.] Tabulates data on the physical and mechanical properties of sound and decayed wood, and *wetwood*. The possibilities of using defective aspen wood in building, box-shook manufacture, pulping, chipboard, etc., are discussed, and some machines for removing decayed wood are described.

832.2

Korenev, N. I., and Margolin, S. S. 1954. IZGOTOVLENIE FANERY IZ OSINY NA BELKOVYH KLEJAH. [MANUFACTURE OF PLYWOOD FROM ASPEN WOOD WITH ALBUMIN GLUES.] Derev. Lesohim. Prom. 3(10): 25-6. [Russ.]

832.3

Anonymous. 1945. ASPEN SOM TANDSTICKSVIRKE. [ASPEN AS A MATCH TIMBER.] Svenska SkogsvForen. Tidskr. 43(6): 479-87. [Sw.]

Gorjany. 1893. P. TREMULA FOR MATCH MANUFACTURE. Rev. Eaux For. 32: 494.

835 INDUSTRIAL AND DOMESTIC WOODWARE (MANUFACTURE AND USE)

Paskovici, N. 1935. PLOPUŁ TREMULATOR CA MATERIE PRIMA PENTRU CONFECTIONAREA PALAȘILOR. [ASPEN AS A RAW MATERIAL FOR HATS.] Rev. Padurilor 47(5): 366-75. [Rum.f.g.]

839 MISCELLANEOUS

Chevedaev, A. A. 1945. KLESHCHEVAJA BOLVANKA IZ NOVIKH POROD. [HAME BLANKS FROM NEW [SUBSTITUTE] WOODS.] Lesn. Prom. 1945(10/12): 10-1. [Russ.]

844.1

Gambogi, P. 1957. ALTERAZIONI CROMATICHE IN LEGNO DI PIOPPO ABBATTUTO. [STAINS OCCURRING IN THE WOOD OF POPULUS TREMULA AFTER FELLING.] Ann. Sper. Agr. (n.s.) 11(4): lxxvii-xcvi. 33 refs. [It. it.e.]

844.2

Ryckova, A.G. 1958. O HIMICESKOM SOSTAVE GNILOJ DREVESINY BEREZY I OSINY. [THE CHEMICAL COMPOSITION OF DECAYED BIRCH AND ASPEN WOOD.] Z. Prikl. Him. 31(2): 265-73. 21 refs. [Russ. russ.]

844.47

Bjorkman, E. 1953. THE OCCURRENCE AND SIGNIFICANCE OF STORAGE DECAY IN BIRCH AND ASPEN WOOD WITH SPECIAL REFERENCE TO EXPERIMENTAL PREVENTIVE MEASURES. Skr. K. Skogshogsk., Stockh. No. 12/19: 53-90. 15 refs. [E.e.sw.]

Tuovinen, A. 1955. KOIVU- JA HAAPAPUUN PILAANTUMINEN. [DAMAGE TO BIRCH AND ASPEN WOOD.] Pap. ja Puu 37(2): 36-41. 5 pp. 8 refs. [Fie.] Reprinted as Tied., Metsateho, Helsinki No. 112. 1955.

A review of previous research, especially that by E. Bjorkman (see preceding reference).

848.4/5

Jazon, A. Ja. 1956. SOHRANENIE SPICECNOJ OSINY V LETNYH USLOVIJAH. [SUMMER STORAGE OF ASPEN LOGS FOR MATCH MANUFACTURE.] Trud. Inst. Leshoz. Probl., Riga No. 10: 133-40. 20 refs. [Russ.russ.]

Bitumen emulsions applied to *the ends of logs gave good protection* against *cracks* and, with *the* addition of phenolic antiseptics, against fungi.

861 PULP AND PAPER MANUFACTURE. TEXTILE AND OTHER CELLULOSE DERIVATIVES

Masirevic, D. 1958. OSOBINE I UPOTREBLJIVOST NASE TOPOLE ZA PROIZVODNJU CELULOZE III. JASIKA (POPULUS TREMULA L.) KAO SIROVINE ZA PROIZVODNJU SULFITNE CELULOZE ZA PAPIR I ZA DALJU YEMISKU PRERADU. [THE PROPERTIES AND POSSIBILITIES OF USING YUGOSLAVIAN POPLARS FOR CELLULOSE. PRODUCTION III P. TREMULA AS A RAW MATERIAL FOR SULPHITE PULP FOR PAPER AND FURTHER CHEMICAL PROCESSING.] Topola, Beograd No. 7: 595-603. [Serb.g.]

861.0

Masirevic, D. 1957. OSOVINE I UPOTREBLJIVOST NASE TOPOLE ZA PROIZVODNJU CELULOZE. II. JASIKA. [THE PROPERTIES AND POSSIBILITY OF USING YUGOSLAV POPLARS FOR CELLULOSE PRODUCTION. II. POPULUS TREMULA.] Topola, Beograd 1(2):93-107. 3 refs. [Serb.g.]

Schach, von. 1888. NOTE ON SUITABILITY OF POPULUS (P. TREMULA) WOOD FOR PAPER MANUFACTURE. Allg. Forst- u. Jagdztg. 64: 372.

861.14

Bruun, H. H. 1958. INSTITUTET FOR TRAKEMI VID ABO AKADEMI: VERKSAMHETENAREN 1955-57. [REPORT ON THE ACTIVITY OF THE INSTITUTE FOR WOOD CHEMISTRY, ABO AKADEMI, 1955-57.] Pap. ja Puu 40(4a):137-40. [Sw.sw.fie.]

Subjects covered include the chemistry of bark of *Alnus glutinosa* and sulphate pulping of *aspen*, *A. incana* and *A. glutinosa*.

861.14/15

Vethe, A., Loras, V., and Loschbrandt, F. 1962. [TRIALS OF RECENT PULPING METHODS FOR HARDWOODS.] Norsk Skogind. 16 (11): 458-69. 7 refs. [Nor.e.]

Compares ease of pulping, and pulp yield and properties of *Betula verrucosa*, *Populus tremula*, and *Alnus incana* pulped by the sulphate and various sulphite processes. Results are given in graphs.

861.15

Kalistratov, G. A. 1960. PULP FROM ASPEN. Bumaznaja Promyslennost', Moskva 35(5): 12-4. [Russ.] From abstr. in Chem. Abstr. 54(22): 25807. 1960.

867.3

Ljamin, V. A. 1962. [GASIFICATION OF SMALL CHIPS OF VARIOUS MOISTURE CONTENT.] Gidrol. Lesohim. Prom. 15(8): 8-11. 7 refs. [Russ.russ.]

Gasification trials were made with small chips of 10-50% m.c. from aspen *fuelwood* containing 16% bark and 10% decayed wood (*Fomes ignarius*). Yields of **liquid products** fell with increasing chip m.c., **while gas** yield rose. **A chip m.c. of 25% proved optimum, but chips of less than 25% m.c. could be used.**

892.62

Sharkov, V.I., and Kalnina, V. N. 1940. OIL FROM THE BARK OF THE ASPEN. Lesokhim. Prom. 1940(7): 3-5. Bblg. [R.]

9 FORESTS AND FORESTRY FROM THE NATIONAL AND INTERNATIONAL POINTS OF VIEW

905.2

Kaldy, J. 1961. UJABB ADATOK A REZGONYAR KERDESHEZ. [RECENT CONTRIBUTIONS TO THE ASPEN PROBLEM.] Erdo 10(9):391-401. 8 refs. [Hu.russ.g.]

P. TREMULOIDES

1 FACTORS OF THE ENVIRONMENT. BIOLOGY

111.84

Marston, R.B. 1956. AIR MOVEMENT UNDER AN ASPEN FOREST AND ON AN ADJACENT OPENING. J. For. 54(7): 468-9. 3 refs.

116.12

Bay, R. R. 1958. FOREST TYPE AFFECTS SNOWPACK. J. Soil Wat. Conserv. 13(3):129-30.

1960. SOIL FREEZING OBSERVATIONS AFTER CHANGES IN FOREST COVER. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 576, 2 pp.

116.2

Croft, A. R. 1950. A WATER COST OF RUNOFF CONTROL. J. Soil. Wat. Conserv. 5 (1): 13-5.

Dunford, E. G., and Niederhof, C. H. 1944. INFLUENCE OF ASPEN, YOUNG LODGEPOLE PINE, AND OPEN GRASSLAND TYPES UPON FACTORS AFFECTING WATER YIELD. J. For. 42(9): 673-7. Bblg.

156 GAME MANAGEMENT. HUNTING AND SHOOTING

Hall, J. G. 1960. WILLOW AND ASPEN IN THE ECOLOGY OF BEAVER ON SAGEHEN CREEK, CALIFORNIA. Ecology 41(3):484-94. 18 refs.

156.2

Lawrence, W. H. 1954. MICHIGAN BEAVER POPULATIONS AS INFLUENCED BY FIRE AND LOGGING. Abstr. of thesis, in Dissert. Abstr. 14(7):1011-2. [Univ. Mich.]

Stegeman, L.C. 1954. THE PRODUCTION OF ASPEN AND ITS UTILIZATION BY BEAVER ON THE HUNTINGTON FOREST. J. Wildlife Mgmt. 18(3): 348-58. 11 refs.

Westell, C.E., Jr. 1954. AVAILABLE BROWSE FOLLOWING ASPEN LOGGING IN LOWER MICHIGAN. J. Wildlife Mgmt. 18(2): 266-71. 2 refs.

160.2

Euler, H. von, and Hahn, L. 1948. NUKLEINSAURE-GEHALT GRÜNER BLÄTTER. I. [NUCLEIC ACID CONTENT OF GREEN LEAVES.] Arkiv. For. Kemi, Mineralogi Och Geologi, Stockh. 258(1): 1-8. 11 refs. [G.g.]

160.22

Pearl, I. A., Darling, S. F., and Justman, O. 1962. STUDIES ON THE LEAVES OF THE FAMILY SALICACEAE. I. POPULIN FROM THE LEAVES OF POPULUS GRANDIDENTATA AND POPULUS TREMULOIDES. J. Organ. Chem. 27(7): 2685-7. 11 refs.

Pridham, J. B. 1960. OLIGOSACCHARIDES AND ASSOCIATED GLYCOSIDASES IN ASPEN TISSUES. Biochem. J. 76 (1): 13-7. 43 refs.

160.29

Hubbes, M. 1962. TWO GLYCOSIDES FROM ASPEN FUNGISTATIC AGAINST HYPOXYLON PRUNATUM (KLOT.) CKE. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. 18(6): 2-3.

The two additional **fungistatic substances isolated from *Populus tremuloides* bark extracts are both glycosides. The highest con-**

centration of *one* occurred in the lower half of the crown, and of the other in the branch-free portion of the stem.

1962. INHIBITION OF HYPOXYLON PRUNATUM BY PYROCATECHOL ISOLATED FROM BARK OF ASPEN. *Science* 136 (3511): 156. 7 refs.

Mathes, M. C. 1963. ANTIMICROBIAL SUBSTANCES FROM ASPEN TISSUE GROWN IN VITRO. *Science* 140(3571):1101-2. 16 refs. Aspen tissue, originally isolated from the approximate cambial region of triploid stem sections, yielded substances producing inhibitory zones when the culture plates were inoculated with *Fusarium roseum*, *Saccharomyces cerevisiae*, *Bacillus* spp., *Penicillium roqueforti*, *Torula utilis*, *Sarcina lutea*, *Flavobacterium aquatile*, *Pullularia pullulans*, and *Staphylococcus aureus*.

161.19

Jensen, R. A., and Davis, J. R. 1955. SEASONAL MOISTURE VARIATIONS IN ASPEN. Minn. For. Note No. 19, 2 pp. Investigations into the moisture content of living trees of *Populus tremuloides* in Minnesota showed that m.c. was at its lowest from June to Sept. inclusive, and high from Nov. to April inclusive, May and Oct. being transitional periods. There were also considerable variations between different parts of Minnesota.

161.2/3

Bourdeau, P. F. 1958. PHOTOSYNTHETIC AND RESPIRATORY RATES IN LEAVES OF MALE AND FEMALE QUAKING ASPENS. *For. Sci.* 4(4): 331-4. 7 refs.

161.32

Pearson, L. C., and Lawrence, D. B. 1958. PHOTOSYNTHESIS IN ASPEN BARK. *Amer. J. Bot.* 45(5):383-7. 7 refs.

Strain, B. R., and Johnson, P. L. 1963. CORTICULAR PHOTOSYNTHESIS AND GROWTH IN *POPULUS TREMULOIDES*. *Ecology* 44(3): 581-4. 13 refs.

161.4

McDougall, G. A. 1963. RADIAL GROWTH STUDIES. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. 19(3): 1. 2 refs.

161.6

Blake, G. M., Hossfeld, R. L., and Pauley, S. S. 1960. A TECHNIQUE FOR DETERMINING SEX FROM VEGETATIVE BUDS OF [SEXUALLY MATURE] QUAKING ASPEN. *For. Sci.* 6(4): 363-4.

Einspahr, D. W. [1962.] SEX RATIO IN QUAKING ASPEN AND POSSIBLE SEX-RELATED CHARACTERISTICS. *Proc., 5th World For. Congr., Seattle 1960*, Vol. 2 (Sect. 2): 747-50. 4 refs. [E.f.span.]

In a survey in natural stands of *Populus tremuloides* in Michigan and Wisconsin, in which nonflowering trees were girdled to produce flowers, the sex ratio did not differ significantly from 1/1. [Cf. Pauley and Mennel, below.] None of the characters studied differed significantly between the sexes over the whole area.

Pauley, S. S., and Mennel, G. F. 1957. SEX RATIO AND HERMAPHRODITISM IN A NATURAL POPULATION OF QUAKING ASPEN [POPULUS TREMULOIDES]. *Minn. For. Note No. 55*, 2 pp. Analysis of the flowers of 206 trees in a native Minnesota population showed a sex ratio of 3 male: 1 female tree. Incidence of hermaphroditism in female trees was 20.6% and in male trees 4%. [Cf. Santamour, below.]

Santamour, F. S. 1956. HERMAPHRODITISM IN *POPULUS*. *Proc., 3rd Ntheast. For. Tree Impr. Conf., Ithaca 1955*: 28-30. Examination of 10 catkins from each of some 600 trees (300 female and 354 male) of *P. tremuloides*, both wild and artificially bred, showed that ca. 48.7% of females bore some male flowers, and 2.8% of males some female flowers. These probably represent minimum figures since only 1 out of the 10 catkins from many trees showed abnormal flowers, and no doubt some of the apparently unisexual trees did in fact have both kinds.

161.9

Petrov, P. I. 1955. O TEMPERATURNOM REZIME DREVESNYH ST"ALOV. [THE TEMPERATURE REGIME OF TREE STEMS.] *Bot. Z.* 40(4): 584-7. 3 refs. [Russ.]

164 MORPHOLOGY

Shope. 1928. STEM AND LEAF STRUCTURE OF ASPEN. *Biol. Abstr.* 2: 13389.

164.3

Day, M. W. 1944. THE ROOT SYSTEM OF ASPEN. *Amer. Midl. Nat.* 32(2): 502-9. Bblg.

164.4

Kaufert, F. 1937. FACTORS INFLUENCING THE FORMATION OF PERIDERM IN ASPEN. *Amer. J. Bot.* 24(1): 24-30.

164.6

Einspahr, D. W. 1960. ABNORMAL FLOWERING BEHAVIOR IN ASPEN. *Iowa St. Coll. J. Sci.* 34(4): 623-30. 15 refs. Describes and illustrates branched staminate catkins and hermaphroditism in *Populus tremuloides*, and late flowering in *P. grandidentata* and *P. tremuloides*.

Erlanson and Hermann. 1930. MORPHOLOGY OF FLOWER IN *P. TREMULOIDES*. *Biol. Abstr.* 4: 12951.

Klaehn, F. U., and Neu, R. L. 1960. HARDWOOD POLLEN STUDY. *Silvae Genet.* 9(2): 44-8. 16 refs. [E.e.g.f.]

Nagaraj, M. 1952. FLORAL MORPHOLOGY OF *POPULUS DELTOIDES* AND *P. TREMULOIDES*. *Bot. Gaz.* 114(2): 222-43. 34 refs.

165.3

Joranson, P. N. 1959. IMPROVEMENT OF HARDWOODS THROUGH GENETICS. *Tappi* 42(8): 691-700. 37 refs.

A general review and discussion of the genetic approach in (mainly) *Populus tremuloides* production, with special reference to pulp and paper technology.

165.41

Barnes, B. V. 1958. ERSTE AUFNAHME EINES SECHSJÄHRIGEN BESTANDES "ON ASPENHYBRIDEN. [PRELIMINARY DATA FROM A SIX-YEAR-OLD STAND OF ASPEN HYBRIDS.] *Silvae Genet.* 7(3): 98-102. 14 refs. [G.g.e.f.]

Schonbach, H. 1960. EINIGE ERGEBNISSE ACHTJÄHRIGER ZÜCHTUNGSVERSUCHE MIT PAPPELARTEN DER SEKTION LEUCE. [SOME RESULTS OF EIGHT-YEAR-OLD BREEDING TRIALS WITH POPLAR VARIETIES OF THE SECTION LEUCE.] *Wiss. Abh. Dtsch. Akad. Landw. Wiss., Berlin* No. 44 (Beitr. Pappelforsch. No. 4): 7-21. 3 refs. [G.g.russ.e.]

165.42

Buijtenen, J. P. van, and Einspahr, D. W. 1959. NOTE ON THE PRESENCE OF SEX CHROMOSOMES IN *POPULUS TREMULOIDES*. *Bot. Gaz.* 121(1): 60-1. 8 refs.

Of 28 staminate individuals of *P. tremuloides*, 6 were found to have a heteromorphic chromosome pair, but a heteromorphic condition was not found in the others. It is unlikely, therefore, that the male sex in *P. tremuloides* is determined in this way.

Joranson, P. N., and Einspahr, D. W. 1958. NATURALLY OCCURRING TRIPLOID QUAKING ASPEN [POPULUS TREMULOIDES] IN THE UNITED STATES. *Proc. Soc. Amer. For.* 1957: 62-4. 12 refs. An account of their discovery in several locations in the Lake States, 1956, of the methods used in searching for them and of the first data obtained on their morphology and fibre dimensions.

Einspahr, D. W., Buijtenen, J. P. van, and Peckham, J. R. 1963. NATURAL VARIATION AND HERITABILITY IN TRIPLOID ASPEN. *Silvae Genet.* 12(2): 51-8. 12 refs. [E.e.g.f.]

165.5

M.-Victorin. 1931. VARIATIONS OF *P. TREMULOIDES* AND *P. GRANDIDENTATA*. *Bot. Cur. Lit.* 13(7): 10.

165.52

Cottam, W. P. 1954. PREVERNAL LEAFING OF ASPEN IN UTAH MOUNTAINS. *J. Arnold Arb.* 35(3): 239-50. 4 refs.

165.71

Barnes, B. V. 1961. HYBRID ASPENS IN THE LOWER PENINSULA OF MICHIGAN. *Rhodora* 63 (755): 311-24. 18 refs.

Pauley, S. S. 1956. NATURAL HYBRIDIZATION OF THE ASPENS [POPULUS TREMULOIDES AND P. GRANDIDENTATA]. Minn. For. Note No. 47, 2 pp.

176.1

Guse. 1912. NOTES ON ASPEN. Allg. Forst-u. Jagdztg. 88: 376.

181 MODE OF LIFE, AUTECOLOGY. SILVICULTURAL CHARACTERS OF TREES

Strothmann, R. O., and Zasada, Z. A. 1957. SILVICULTURAL CHARACTERS OF QUAKING ASPEN (POPULUS TREMULOIDES). U. S. For. Serv. Lake St. For. Exp. Sta., Sta. Pap. No. 49, 26 pp. 91 refs.

Weigle and Frothingham. 1911. THE ASPENS. U. S. Dep. Agric. Bull. 93.

181.2

Farmer, R. E., Jr. 1963. EFFECT OF LIGHT INTENSITY ON GROWTH OF POPULUS TREMULOIDES CUTTINGS UNDER TWO TEMPERATURE REGIMES. *Ecology* 44(2):409-11. 7 refs.

181.21

Buell, M. F., and Buell, H. F. 1959. ASPEN INVASION OF PRAIRIE. Bull. Torrey Bot. Cl. 86(4): 264-5. 2 refs.

A study of the root systems of aspen on prairie in Mahanomen County, Minn., suggests that, *whereas in the past fire has kept the aspen groves reduced and the trees small, settlement and the practice of harvesting wild prairie hay has protected the groves and resulted in vigorous growth of aspen and of their long, propagating roots.*

181.312

Croft, A. R., and Monninger, L. V. 1953. EVAPOTRANSPIRATION AND OTHER WATER LOSSES ON SOME ASPEN FOREST TYPES IN RELATION TO WATER AVAILABLE FOR STREAM FLOW. Trans. Amer. Geophys. Union 34(4): 563-74. 7 refs.

Marston, R. B., and Julander, O. 1961. PLANT COVER REDUCTIONS BY POCKET GOPHERS FOLLOWING EXPERIMENTAL REMOVAL OF ASPEN FROM A WATERSHED AREA IN UTAH. J. For. 59(2):100-2. 5 refs.

[U.S.A.: Rocky Mt. For. Exp. Sta.][1959.] ASPEN USES MORE WATER THAN SPRUCE OR GRASSLAND IN WESTERN COLORADO. Rep. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. 1958: 9. The relative water use, determined in 1955 and 1957 by the difference in soil moisture content (to an 8-ft. depth) at the beginning and end of the growing season plus the amount of precipitation averaged 19.04 in. for aspen, 14.50 in. for spruce, and 9.78 in. for grassland. [Cf. Croft and Monninger, above.]

181.319

Bendtsen, B. A., and Rees, L. W. 1962. WATER-CONTENT VARIATION IN THE STANDING ASPEN TREE. For. Prod. J. 12(9): 426-8. 2 refs.

181.32

Stoeckeler, J. H. 1948. THE GROWTH OF QUAKING ASPEN AS AFFECTED BY SOIL PROPERTIES AND FIRE. J. For. 46(10): 727-37. 17 refs.

181.343

Stoeckeler, J. H. 1961. ORGANIC LAYERS IN MINNESOTA ASPEN STANDS AND THEIR ROLE IN SOIL IMPROVEMENT. For. Sci. 7(1): 66-71. 15 refs.

181.36

Berndt, H. W., and Gibbons, R. D. 1958. ROOT DISTRIBUTION OF SOME NATIVE TREES AND UNDERSTORY PLANTS GROWING ON THREE SITES WITHIN PONDEROSA PINE WATERSHEDS IN COLORADO. U.S. For. Serv. Rocky Mt. For. Range Exp. Sta., Sta. Pap. No. 37, 14 pp.

181.51

Sandberg, D., and Schneider, A. E. 1953. THE REGENERATION OF ASPEN BY SUCKERING. Minn. For. Note No. 24, 2 pp.

Summarizes *the results of* two studies: (1) on *the* phenomena of suckering in *populus tremuloides*, (2) on *the* conditions favoring *the* regeneration of *P. tremuloides* stands *by* suckering.

181.52

Ellison, L. 1943. A NATURAL SEEDLING OF WESTERN ASPEN. J. For. 41(10): 767-8.

Larson, G. C. 1944. MORE ON SEEDLINGS OF WESTERN ASPEN. J. For. 42(6): 452.

181.521

Einspahr, D. W., and Joranson, P. N. 1960. LATE FLOWERING IN ASPEN AND ITS RELATION TO NATURALLY OCCURRING HYBRIDS. For. Sci. 6(3): 221-4. 8 refs.

Reports, with illustrations, *the* flowering of male and female catkins of *P. tremuloides* 10 days *later than the rest* and providing thereby *the necessary* time bridge to *explain local* hybridization with *P. grandidentata*. [See Pauley, 1956, *P. tremuloides*, 165.71.]

Lester, D. T. 1963. FLORAL INITIATION AND DEVELOPMENT IN QUAKING ASPEN. For. Sci. 9(3): 323-9. 4 refs.

181.8

Marr, J. W. 1947. FROST INJURY TO ASPEN IN COLORADO. Abstr. in Bull. Ecol. Soc. Amer. 28(4): 60.

Smirnov, V. V. 1962. [THE SEASONAL GROWTH OF ASPEN.] Soobsc. Lab. Lesoved., Moskva No. 6: 94-111. 20 refs. [Russ.]

182 SYNECOLOGY. PLANT SOCIOLOGY

Baker. 1925. ASPEN IN CENTRAL ROCKY MOUNTAIN REGION. U. S. Dep. Agric. Bull. 1291.

Kittredge, J. 1938. THE INTERRELATIONS OF HABITAT, GROWTH RATE AND ASSOCIATED VEGETATION IN THE ASPEN COMMUNITY OF MINNESOTA AND WISCONSIN. Ecol. Monogr. 8: 151-246. Bblg.

182.3

Baker. 1918. ASPEN AS A TEMPORARY FOREST TYPE. J. For. 16: 294.

Fetherolf. 1917. ASPEN AS PERMANENT FOREST TYPE. J. For. 15: 757.

Gates. 1931. ASPEN ASSOCIATION IN N. LOWER MICHIGAN. Biol. Abstr. 5: 26767.

182.47

Ellison, L., and Houston, W. R. 1958. PRODUCTION OF HERBACEOUS VEGETATION IN OPENINGS AND UNDER CANOPIES OF WESTERN ASPEN [POPULUS TREMULOIDES]. *Ecology* 39(2): 337-45. 19 refs. Heavier grazing by livestock in *openings* is believed to *be responsible for the poorer* production and species composition of the *herbaceous* vegetation commonly noted in *openings than under the* aspen canopy.

187 VEGETATION TYPES

Hoff, C.C. 1957. A COMPARISON OF SOIL, CLIMATE, AND BIOTA OF CONIFER AND ASPEN COMMUNITIES IN THE CENTRAL ROCKY MOUNTAINS. Amer. Midl. Nat. 58(1): 115-40. 12 refs.

187 X 164

Courtemanche, A. 1949. SPECTRE BIOLOGIQUE DU POPELUM TREMULOIDIS DANS LE SUD-EST DU CANADA. [BIOLOGICAL SPECTRUM OF THE POPELUM TREMULOIDES IN SOUTHEASTERN CANADA.] Ann. de l'ACFAS, Montreal 15: 120-2. 7 refs. [F.]

Heinselman, M. L. 1954. THE EXTENT OF NATURAL CONVERSION TO OTHER SPECIES IN THE LAKE STATES ASPEN-BIRCH TYPE. J. For. 52(10): 737-8.

Of the existing 19.5 million acres of aspen/birch, *present* trends indicate that, by 1990, 2.1 will have reverted to northern hardwoods, 1.43 to spruce/fir, 0.75 to mixed types and 0.08 to pine. Low value types will cover more than 1.0 million acres, 2.6 are already partly converted to other types and 9.5 do not give much promise of conversion in the foreseeable future.

187 X 165

Kagis, I. 1954. THE STORY OF A CUT-OVER. For. Chron. **30**(2): 158-82. 4 refs.

187 X 424.72

Lynch, D. 1955. ECOLOGY OF THE ASPEN GROVELAND IN GLACIER COUNTY, MONTANA. Ecol. Monogr. **25**(4):321-44. 42 refs.

187 X 574/575

Bird, R. D. 1961. ECOLOGY OF THE ASPEN PARKLAND OF WESTERN CANADA IN RELATION TO LAND USE. Publ. Dep. Agric. Can. No.

1066, 155 pp. 200 refs.

An account of the original conditions, and changes in plant and animal ecology *that have* taken place since white settlement of *the* Prairie Provinces, as a result of hunting, fire, cultivation, etc. *The aspen* parkland lies between the great plains and *the* boreal forest; *the land is in many places poorly* drained and covered with small bodies of water; on the drier parts grassland and aspen-dominated *forest are* intermixed.

2 SILVICULTURE

[U.S.A.: Lake St. For. Exp. Sta.] 1931. GROWING BIGGER AND BETTER ASPEN. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes 52.

[U.S.A.: Paper Tr. J.] 1952. OVERCOMING THE THREAT TO ASPEN. Paper Tr. J. **135**(1): 14.

A brief discussion of a research into the protection of aspen stands from invasion by maple *and other* hardwoods on good soil, and *by oak or poorer soil (in Michigan)*.

22 SILVICULTURE SYSTEMS. CONSTITUTION AND COMPOSITION OF STANDS; FORMS OF STAND

Stock, 1933. SILVICULTURAL TREATMENT AND YIELD OF ASPEN. Dtsch. Forstw. **15**: 289-99.

221.1

Reinke, M. E. 1955. MANAGEMENT OF ASPEN. Wis. Conserv. Bull. **20**(11): 25-8.

Recommends clear felling for aspen (both *bigtooth* and trembling *aspen*) at maturity, which is reached in Wisconsin stands at *ca. 40-50* years. Yields vary from 5 to 25 cords/acre depending on *the soil* moisture and fire history of the stand.

221.52

Logan, K. T. 1962. GROWTH OF WHITE PINE SEEDLINGS BENEATH AN ASPEN STAND. Tech. Note Dep. For. Can. No. 121, 13 pp. 9 refs.

228 CONSTITUTION AND COMPOSITION OF STANDS; FORMS OF STAND

Eyre, 1933. ASPEN COMPETITION IN NORWAY PINE PLANTATIONS. J. For. **31**: 318.

[U.S.A.: Lake St. For. Exp. Sta.] 1930. GERMINATION AND SURVIVAL OF CONIFERS UNDER ASPEN. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 28.

228.1 1

Baldwin, H. I. 1949. GROWTH AND WEEVIL DAMAGE OF NORWAY SPRUCE GROWING UNDER ASPEN. Fox For. Notes No. 45, 1 p.

228.12

Cayford, J. H. 1957. INFLUENCE OF THE ASPEN OVERSTORY ON WHITE SPRUCE GROWTH IN SASKATCHEWAN. Tech. Note For. Br. Can. No. 58, 12 pp. 12 refs.

228.3

Kagis, I. 1952. SOME PROBLEMS OF MIXEDWOOD STANDS. For. Chron. **28**(2): 6-18.

MacLeod, W. K., and Blyth, A. W. 1955. YIELD OF EVEN-AGED FULLY STOCKED SPRUCE-POPULAR STANDS IN NORTHERN ALBERTA. Tech. Note For. Br. Can. No. 18, 33 pp. 28 refs.

No *growth* data *have* previously *been* available for this important forest type (*Picea glauca*/*Populus tremuloides*). In spite of the difficulty of preparing yield tables for mixed stands, an attempt is made on *the* basis of 127 temporary sample plots, to provide tables suitable *for* the present stage of management in *the* area.

23 REGENERATION AND FORMATION OF STANDS

Baker, 1918. ASPEN REPRODUCTION AND MANAGEMENT. J. For. **16**: 389.

231 NATURAL REGENERATION

Farrar, J. L., Gray, D. W., and Avery, D. 1954. JACKPINE REPRODUCTION. Pulp Paper Mag. Can. **55**(12): 136-146. 16 refs.

231.5

Farmer, R. E., Jr. 1962. DEPTH AND DIAMETER OF THE PARENT ROOTS OF ASPEN ROOT SUCKERS. Mich. For. No. 23, 4 pp. 4 refs. A study was made on *Populus tremuloides* (a) and *P. grandidentata* (b) root suckers. On *the* whole, (a) suckered nearer the soil surface and from smaller roots than (b) which occupies *the whole* A horizon more completely. *This* difference probably accounts for *the* advantage of (b) *over* (a) on *shallow dry* sites.

1962. SOME PHYSIOLOGICAL ASPECTS OF ROOT SUCKER INITIATION AND EARLY GROWTH IN *POPULUS TREMULOIDES* AND *P. GRANDIDENTATA*. Abstr. of thesis, in Dissert. Abstr. **23**(1): 10. [Univ. Mich.]

1962. ASPEN ROOT SUCKER FORMATION AND APICAL DOMINANCE. For. Sci. **8**(4):403-10. 23 refs.

Larson, M. M. 1959. REGENERATING ASPEN BY SUCKERING IN THE SOUTHWEST. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. Res. Note No. 39, 2 pp. 1 ref.

Stoeckeler, J. H., and Macon, J. W. 1956. REGENERATION OF ASPEN CUTOVER AREAS IN NORTHERN WISCONSIN. J. For. **54**(1): 13-6. 9 refs.

Strothmann, R. O., and Heinselman, M. L. 1957. FIVE-YEAR RESULTS IN AN ASPEN SUCKER DENSITY STUDY. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note 490, 2 pp.

At the Pike Bay Experimental Forest, Minn., survival and average height *after* 5 years were measured on 1/20-acre plots of B-year aspen suckers with average densities of 260, 500, 1,000, 1,500 and a control of ca. 10,060 stems/acre. *Plots for* each stand density *were* replicated *three* times. Varying stand density had little effect on height *growth*. Survival decreased with increasing density. Suckering continues for 3 years if stands are thinned immediately after establishment.

[U.S.A.: Lake St. For. Exp. Sta.][1951.][DISKING TO STIMULATE ASPEN REPRODUCTION.] Rep. U.S. For. Serv. Lake St. For. Exp. Sta. 1950: 11-2.

Westell, C. E., Jr. 1961. THE ECOLOGY OF DEER AND ASPEN IN LOWER MICHIGAN. Abstr. of thesis, in Dissert. Abstr. **21**(8): 2067-8. [Univ. Mich.]

Zillgitt, W. M. 1951. DISKING TO INCREASE STOCKING IN ASPEN STANDS. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 357, 1 p.

232.13

Stoeckeler, J. H., and Strothmann, R. O. 1955. EARLY DEVELOPMENT OF NATIVE AND HYBRID ASPENS. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 427, 1 p. Survival and heights in their third and fourth year of 50 trees each of: *Populus tremuloides* (Mass.) × *P. tremula* [Munich]; *P. tremuloides* (Wis.); and *P. tremuloides* (Mass.) × *P. tremuloides* (Colorado), grown on the Argonne Experimental Station, N.E. Wisconsin.

232.32

Einspahr, D. W. 1959. NURSERY PRODUCTION OF ASPEN SEEDLINGS. U. S. For. Serv. Tree Plant. Notes No. 35: 22-4. 1 ref. Experiments indicate that seedlings of *Populus tremuloides* and *P. grandidentata* suitable for field planting can be obtained in one season by sowing in sterilized seedbeds covered with a layer of acid sand; daily watering and screening against rain drops are necessary until early July, when the screens are removed and watering done twice weekly.

232.323.5

Benson, M.K. 1962. IMPROVED METHOD FOR NURSERY PRODUCTION OF QUAKING ASPEN. [POPULUS TREMULOIDES] SEEDLINGS. U. S. For. Serv. Tree Plant. Notes No. 53: 11-3. 1 ref. Trials were made to determine whether *P. tremuloides* seed must be actually on the surface of the soil in order to germinate and survive, as is generally believed. Experiments showed that it could be covered by as much as 1/8 in. of soil with little ill effect, and on this basis a new technique was evolved and is described.

232.328.1

Farmer, R. E., Jr. 1963. VEGETATIVE PROPAGATION OF ASPEN BY GREENWOOD CUTTINGS. J. For. 61(5): 385-6. 8 refs.

Snow, A. G. 1938. USE OF INDOLEBUTYRIC ACID TO STIMULATE THE ROOTING OF DORMANT ASPEN CUTTINGS. J. For. 36(6): 582-7. Bblg.

232.328.4

Chouinard, L. 1956. ESSAI DE MARCOTTAGE EN L'AIR DE BETULA Papyrifera, POPULUS tremuloides, LARIX laricina, ET ABIES balsamea. [TRIALS OF AIRLAYERING WITH B. Papyrifera, P. tremuloides, L. laricina AND A. balsamea.] Texte Conf. 36th Assembl. Ann. Corp. Ingen. For. Quebec 1956: 47-53. 9 refs. [F.] Experiments were made on 18 trees each of the four species, two marcottes being made on each tree. Roots were formed in 5 cases in birch, 4 in poplar, 1 in larch and none in balsam fir.

— and Parrot, L. 1958. THE CALLUSING AND ROOTING OF AIRLAYERS IN BETULA Papyrifera, POPULUS tremuloides, LARIX laricina AND ABIES balsamea. Contr. Fonds Rech. For. Univ. Laval No. 2, 16 pp. 8 refs. [E.f.]

232.329.9

Einspahr, D. W., and Buijtenen, J. P. van. 1961. THE INFLUENCE OF GIBBERELIC ACID ON GROWTH AND FIBER LENGTH OF QUAKING ASPEN. For. Sci. 7(1): 43-51. 9 refs.

234 FORMATION OF FOREST BY NATURAL SUCCESSION

Leisman, G. A. 1955. A VEGETATION AND SOIL CHRONOSEQUENCE ON THE MESABI IRON RANGE SPOIL BANKS, MINNESOTA. Abstr. of thesis, in Dissert. Abstr. 15(11): 1987-8. [Univ. Minn.]

— 1957. A VEGETATION AND SOIL CHRONOSEQUENCE ON THE MESABI IRON RANGE SPOIL BANKS, MINNESOTA. Ecol. Monogr. 27(3): 221-45. 34 refs.

235.1

Logan, K. T., and Farrar, J. L. 1953. AN ATTEMPT TO GROW WHITE PINE [PINUS STROBUS] UNDER AN ASPEN [POPULUS TREMULOIDES] STAND. Silv. Leaflet. For. Br. Can. 77, 3 pp. Reexamination in 1950 of an experimental planting of white pine under aspen made in 1936, showed that it had been unsuccessful, owing to competition for light and rooting space. There were indications however that the shade from the aspen was beneficial in discouraging weevil attack on the pine.

Skilling, D. D. 1953. THE GROWTH OF UNDERPLANTED WHITE PINE. Mich. For. No. 2, 2 pp.

The high survival and good condition of a 21-year-old *Pinus strobus* stand, planted under an open hardwood stand on a dry sandy site is described (56% survival, mean ht. 7.1 ft.). Artificial release is not necessary, since release will occur naturally from the deterioration of aspen in the overstory.

Waldron, R. M. 1961. SEEDING WHITE SPRUCE AT THE BASE OF ASPEN. For. Chron. 37(3): 224-7, 233. 3 refs.

Three methods of sowing *Picea glauca* at the base of *Populus tremuloides*, (a) in the humus layer, (b) in moss, and (c) on scalped patches, were tested in dense young, and open mature, stands. Results indicated that (c) was more favorable than (a) or (b) for germination, and better for survival than scalped patches between trees.

242 THINNINGS

Day, M. W. 1958. THINNING ASPEN IN UPPER MICHIGAN. Quart. Bull. Mich. Agric. Exp. Sta. 41(2): 311-20.

Heinselmann, M. L. 1952. LABOR COSTS FOR THINNING YOUNG ASPEN. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 374, 1 p.

Results of thinning two stands, one at 11 and the other at 20 years showed that costs are much lower for the early thinning, even at compound interest. Later thinnings involve heavy axe-work.

1954. THINNING FROM ABOVE REDUCES TOTAL YIELDS IN MEDIUM SITE ASPEN [POPULUS TREMULOIDES]. U.S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 411, 1 p. Summarizes the results of a study on a series of plots established in 1941 on 30-year-old medium quality aspen.

Herman, F. R. 1949. GROWTH OF ASPEN FOLLOWING PARTIAL CUTTING. U. S. For. Serv. Sthwest. For. Range Exp. Sta. Res. Notes No. 117, 3 pp. Data on growth of *Populus tremuloides* in Arizona following partial cutting.

Pike, R.T. 1953. THINNING ASPEN, DUCK MOUNTAIN FOREST RESERVE, MANITOBA. PROJECT MS-5. Silv. Leaflet. For. Br. Can. No. 89, 3 pp. Tabulated results of observations over 20 years on three plots given different thinning treatments at 35 years.

243 OPENING OF THE CANOPY (INCREMENT FELLINGS, OVERHEAD RELEASE AND IMPROVEMENT FELLINGS)

Cooley, J. H., and Lord, W. B. 1958. A STUDY OF ASPEN-BALSAM FIR CUTTING METHODS IN NORTHERN WISCONSIN—FIVE-YEAR RESULTS. J. For. 56(10): 731-6. 11 refs.

Engle, L.G. 1949. CUTTING ASPEN OVERSTORY IMPROVES GROWTH OF YOUNG HARDWOODS. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 314, 1 p.

Stenekker, G.A. 1963. RESULTS OF A 1936 RELEASE CUTTING TO FAVOUR WHITE SPRUCE IN A 50-YEAR-OLD WHITE-SPRUCE/ASPEN STAND IN MANITOBA. Publ. Dep. For. Can. No. 1005, 17 pp. 18 refs. [E.e.f.]

Stoeckeler, J. H. 1947. WHEN IS PLANTATION RELEASE MOST EFFECTIVE? J. For. 45(4): 265-71. Bblg.

243.8

Day, W. M. 1947. THE USE OF DINITRO PHENOL FOR THE CONTROL OF ASPEN. Quart. Bull. Mich. Agric. Exp. Sta. 30(2): 241-3. Bblg.

Quaite, J. 1953. POISONING WITH "AMMATE" TO ELIMINATE ASPEN [POPULUS TREMULOIDES]. Project A-13. Silv. Leaflet. For. Br. Can. No. 94, 2 pp.

Stump treatment or notch treatment of living *P. tremuloides* with Ammate (NH₄ sulphamate) was effective in killing trees and preventing sprouting. Many untreated trees were killed through the connecting root system. Trees less than 1 in. d.b.h. were harder and more expensive to kill. The poison was more effective when applied in late summer or autumn.

Waldron, R. M. 1961. GIRDLING, BASAL SPRAYING AND FRILLING OF MATURE ASPEN. Timber of Canada 22(12): 34-5.

268.1

Sampson. 1919. EFFECT OF GRAZING ON ASPEN REPRODUCTION. U. S. Dep. Agric. Bull. No. 741.

[U.S.A.: Rocky Mt. For. Range Exp. Sta.] [1947.] NET RAINFALL AND SOIL MOISTURE UNDER ASPEN NOT AFFECTED BY CATTLE GRAZING. Rep. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. 1946: 33-4.

3 WORK SCIENCE. HARVESTING OF WOOD: LOGGING AND TRANSPORT. FOREST ENGINEERING

31 LOGGING AND TRANSPORT: GENERAL

Schantz-Hansen, T. 1945. HARVESTING YOUNG ASPEN ON THE CLOQUET FOREST. J. For. 43(7):506-7.

——— 1948. LOGGING METHODS AND PEELING OF ASPEN (POPULUS TREMULOIDES). U. S. For. Serv. Lake St. Aspen Rep. No. 3, 13 pp.

322.3

Panshin, A. J., Raphael, H. J., and Day, M. W. 1953. FURTHER OBSERVATIONS ON "CHEMICAL" BARK PEELING OF ASPEN. Quart. Bull. Mich. Agric. Exp. Sta. 35(4): 474-81.

Raphael, H. J. 1954. ANATOMICAL CHANGES IN TREMBLING ASPEN (POPULUS TREMULOIDES MICHX.) INDUCED BY THE APPLICATION OF CHEMICAL AGENTS TO THE STEM. Quart. Bull. Mich. Agric. Exp. Sta. 37(2): 241-7. 5 refs.

The results of this study suggest that bark loosening is caused

by a combination of chemical and physical changes occurring in the cambial region and adjacent tissues. The collapse of newly formed xylem cells and the accompanying lacunae, in conjunction with collapse and disintegration of cambial and phloem cells results in the formation of a belt of weakened material that can be ruptured very easily. Collapse of cells seems to be partially caused by a contraction of the whole phloem region.

——— Panshin, A. J., and Day, M. W. 1954. "CHEMICAL" BARK PEELING OF ASPEN, 1952 AND 1953 FIELD TESTS. Quart. Bull. Mich. Agric. Exp. Sta. 37(2):230-40.

Shiue, C. -J., Brown, R. M., and Rees, L. W. 1958. ASPEN DEBARKING WITH 2,4,5-T. J. For. 56(7):503-7. 10 refs.

378.44

Sonley, G. R. 1956. FLOTATION OF ASPEN. Pulp Paper Mag. Can. 57(2): 95-6. 1 ref. (Woodl. Sect. Index Canad. Pulp Pap. Ass. No. 1543 (B-g-b).)

4 FOREST INJURIES AND PROTECTION

Christensen, C. M., Anderson, R. L., Hodson, A. C., and Rudolf, P. O. 1951. ENEMIES OF ASPEN. U. S. For. Serv. Lake St. Aspen Rep. No. 22, 16 pp.

Enumerates, with brief descriptions, the damage caused to aspen by fungi, insects, mammals and birds, climatic factors and fire.

416.1 1

Barter, G. W., and Cameron, D. G. 1955. SOME EFFECTS OF DEFOLIATION BY THE FOREST TENT CATERPILLAR. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 11(6): 1.

Batzler, H. O., Hodson, A. C., and Schneider, A. E. 1954. PRELIMINARY RESULTS OF AN INQUIRY INTO EFFECTS OF DEFOLIATION OF ASPEN TREES BY THE FOREST TENT CATERPILLAR [MALACOSOMA DISSTRIA]. Minn. For. Note No. 31, 2 pp.

No tree was found whose death could be attributed solely to defoliation. In general the extent of crown dieback was directly related to vigor class, but appeared to be unaffected by stand age, density or site.

Condrashoff, S. F. 1958. DIFFERENCES IN ASPEN PHENOLOGY AND SURVIVAL OF IMMATURE STAGES OF PHYLLOCLISTIS POPULIELLA CHAMB. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 14(6): 3-4.

Dils, R. E., and Day, M. W. 1950. EFFECT OF DEFOLIATION UPON THE GROWTH OF ASPEN. Quart. Bull. Mich. Agric. Exp. Sta. 33(2): 111-3. 3 refs.

Duncan, D. P., and Hodson, A. C. 1958. INFLUENCE OF THE FOREST TENT CATERPILLAR UPON THE ASPEN FORESTS OF MINNESOTA. For. Sci. 4(1): 71-93. 14 refs.

——— Hodson, A. C., Schneider, A. E., and others. 1956. INFLUENCE OF THE FOREST TENT CATERPILLAR (MALACOSOMA DISSTRIA HBR.) UPON THE ASPEN FORESTS OF MINNESOTA. Office of Iron Range Resources and Rehabilitation, St. Paul, Minn. 45 pp. 10 refs.

Serious epidemics take place about once in 10 years. The effect of defoliation upon aspen [populus tremuloides] increment is likely to be a reduction of ca. 70% in the first year of a heavy defoliation, ca. 90% during the second, and ca. 15% during the year of recovery. The favorable effect of aspen and hazel defoliation on the coniferous regeneration in the understory is slight and temporary, since defoliation does not kill them.

Froelich, R., Hodson, A. C., Schneider, A. E., and Duncan, D. P. 1955. INFLUENCE OF ASPEN DEFOLIATION BY THE FOREST TENT CATERPILLAR IN MINNESOTA ON THE RADIAL GROWTH OF ASSOCIATED BALSAM FIR. Minn. For. Note No. 45, 2 pp. 2 refs.

——— Shine, C. -J., Duncan, D. P., and Hodson, A. C. 1956. THE EFFECT OF RAINFALL ON THE BASAL AREA GROWTH OF ASPEN AS RELATED TO DEFOLIATION BY THE FOREST TENT CATERPILLAR [MALACOSOMA DISSTRIA]. Minn. For. Note No. 48, 2 pp.

Ghent, A. W. 1958. MORTALITY OF OVERSTORY TREMBLING ASPEN IN RELATION TO OUTBREAKS OF THE FOREST TENT CATERPILLAR [MALACOSOMA DISSTRIA] AND THE SPRUCE BUDWORM [CHORISTONEURA FUMIFERANA]. Ecology 39(2): 222-32. 9 refs.

Green, G. W., and Sullivan, C. R. 1950. ANTS ATTACKING LARVAE OF THE FOREST TENT CATERPILLAR, MALACOSOMA DISSTRIA HBN. (LEPIDOPTERA: LASIOTAMPIDAE). Canad. Ent. 82 (9): 194-5.

Hildahl, V., and Reeks, W. A. 1960. OUTBREAKS OF THE FOREST TENT CATERPILLAR, MALACOSOMA DISSTRIA HBN., AND THEIR EFFECTS ON STANDS OF TREMBLING ASPEN IN MANITOBA AND SASKATCHEWAN. Canad. Ent. 92(3):199-209. 14 refs. (Contr. Div. For. Biol. Dep. Agric. Can. No. 571.)

Prentice, R. M. 1951. FURTHER NOTES ON THE LARGE ASPEN TORTRIX. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 7(5): 2. Notes on the life history of Cacoecia (Archips) conflictana, a pest of Populus tremuloides in the Prairie Provinces.

Rose, A. H. 1958. THE EFFECT OF DEFOLIATION ON FOLIAGE PRODUCTION AND RADIAL GROWTH OF QUAKING ASPEN. For. Sci. 4(4): 335-42. 10 refs.

——— and Smereka, E. P. 1959. NOTES OF THE AMERICAN ASPEN BEETLE. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 15(3): 1.

Notes on life history and morphology of Gonioctena americana, a defoliator of Populus tremuloides.

Smereka, E. P. 1960. SOME NOTES ON LOBOPHORANIVIGERATA WALKER. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 16(4): 1.

This is one of the more common geometrids found on aspen in the Cedar Lake area of N.W. Ontario in 1959. Notes are given on life history, parasites, etc.

416.13

Herdy, H. 1963. MELANAGROMYZASCHINERI (GIRAUD) ON TREMBLING ASPEN IN ONTARIO. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. 19(5): 2.

During 1961 and 1962 all stages of M. schineri were collected from galls on Populus tremuloides in Ontario, and the biology and behavior of the insect observed in detail, it is believed for the first time. It usually attacks young aspen reproduction less than 1 in. d.b.h. and 2-10 ft. high. In some stands, 14.6% of stems bore one or more galls.

416.15

Boyer, M. G. 1962. A LEAF-SPOTTING DISEASE OF HYBRID AND NATIVE ASPEN. *Canad. J. Bot.* 40(9): 1237-42. 3 refs.

Mielke, J. L. 1957. ASPEN LEAF BLIGHT IN THE INTERMOUNTAIN REGION. U. S. For. Serv. Intermt. For. Range Exp. Sta. Res. Note No. 42, 5 pp. 10 refs.

Notes on *the* distribution *and* hosts, epidemiology and symptoms of and damage *caused by* Marssonina populi which attacks *the leaves and shoots of young Populus tremuloides* trees.

Nordin, V. J. 1953. A LEAF-SPOT DISEASE OF ASPEN. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 9(2): 4.

A leaf-spot disease of *Populus tremuloides* *has* reached epidemic proportions in Alberta. The causal fungus *has* been identified as *Marssonina tremuloidis*.

416.17

[U.S.A.: Rocky Mt. For. Range Exp. Sta.] 1961. BROOMING OF NARROWLEAF COTTONWOOD [POPULUS ANGUSTIFOLIA] AND ASPEN [POPULUS TREMULOIDES] MAY RESULT FROM WINTER INJURY. Rep. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. 1960: 18. Superficially the brooms resemble brooms of parasitic origin, but *it is* suspected that *they are regrowths* following *the* killing of the original branches by severe spring frost. Brooms on *both species are* characterized by unusually large leaves, e.g. 7 in. long on *aspen* vs. 2-3 in. for normal leaves.

416.3

Drouin, J. A., McLeod, B. B., and Wong, H. R. 1961. A ROUND-HEADED BORER IN THE ROOT COLLAR OF POPLARS. Bi-m. Progr. Rep. For. Biol. Div. Dep. For. Can. 17(2): 2-3.

Populus tremuloides reproduction having a gnarled bulbous base are common in the Prince Albert area of Saskatchewan. Examination of affected trees *disclosed extensive tunnelling in the* heartwood of *the* rootcollars, apparently due to a *Saperda* sp. closely resembling *S. calcarata*.

416.3/5

Basham, J. T. 1958. DECAY OF TREMBLING ASPEN. *Canad. J. Bot.* 36: 491-505. 11 refs. (Contr. Div. For. Biol. Dep. Agric. Can. No. 344.)

1960. STUDIES IN FOREST PATHOLOGY. XXI. THE EFFECTS OF DECAY ON THE PRODUCTION OF TREMBLING ASPEN PULPWOOD IN THE UPPER PIC REGION OF ONTARIO. Publ. Dep. Agric. Can. No. 1060, 25 pp. 5 refs.

Black, R. L. 1951. POPLAR DECAY STUDY. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 7(2): 2.

1953. RADULUM CASEARIUM, A POPLAR DECAY FUNGUS. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 9 (4) : 3. A study of *decay* in *Populus tremuloides* in N. Ontario showed that *R. casearium* caused 20% of all cull losses from decay, and an even *higher* percent was found in Manitoba. Laboratory experiments with the fungus showed that optimum temperature for *growth* was 30° C. and optimum pH *between 5.1 and 6.0*. The fungus *has never been found on* balsam poplars *and it is suggested* that the pH of the sap of balsam poplars may *be* inhibitory to its *growth*.

Davidson, R. W., Hinds, T. E., and Hawksworth, F. G. 1959. DECAY OF ASPEN IN COLORADO. U.S. For. Serv. Rocky Mt. For. Range Exp. Sta., Sta. Pap. No. 45, 14 pp. 10 refs.

Vanin, S. I., Bazenov, V. A., and Vihrov, V. E. 1953. O VLAZNOSTI ZDOROVOI I PORAZENNOI GRIBAMI DREVESINY V STVOLAH RASTUSCH DEREVJEV. [MOISTURE CONTENT OF HEALTHY AND FUNGUS-INFECTED WOOD IN STEMS OF GROWING TREES.] Trud. Inst. Les. 9: 255-60. 2 refs. [Russ.]

416.4

Anderson, G. W. 1958. HYPOXYLON INFECTION NOT GREATLY INFLUENCED BY SEX OF ASPEN TREES. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 535, 1 p.

A survey of 495 aspens in N. Minnesota showed Hypoxylon canker to occur on both male and female trees, with a slightly higher level of infection for female trees.

Anderson, R. L. 1952. FACTORS INFLUENCING THE INCIDENCE OF HYPOXYLON CANKER OF ASPEN. Abstr. in Phytopathology 42(9): 463.

1953. HYPOXYLON CANKER OF ASPEN IN THE LAKE STATES. U.S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 400, 1 p.

Correlations *between* incidence of *canker and such factors as* site quality and *tree* density are discussed. Practical conclusions *are* that stands on poor *sites* should be *converted to species* better adapted to such *sites, and* stands on better *sites* should be maintained at 70 percent full stocking *and over*.

1955. HYPOXYLON [H. PRUINATUM] CANKER OF ASPEN. For. Pest Leaflet U. S. Dep. Agric. No. 6, 3 pp. 5 refs.

Andrews, S. R., and Eslyn, W. E. 1960. SOOTY-BARK CANKER OF ASPEN IN NEW MEXICO. U. S. Dep. Agric. Plant Dis. Repr. 44(5): 373. 2 refs.

Cenangium *singulare* was found on *Populus tremuloides* on widely separated sites in 1959.

Davidson, R. W., and Cash, E. K. 1956. A CENANGIUM ASSOCIATED WITH SOOTY-BARK CANKER OF ASPEN. Phytopathology 46(1): 34-6. 6 refs.

Sooty bark *canker of aspen (P. tremuloides)* *is here* reported for the first time (in the Central Rocky Mts.). The bark becomes blackened but remains intact *over* the cankered area, *which is* found *up to* 60-70 ft. *up the* trunk. In 3-5 years a discomycete, *here named Cenangium singulare* (Rehm.) comb. nov. fruits abundantly *in the* canker. It may appear in *the centres of the* cankers *before they* girdle *and kill the tree but it is most* abundant in *the* diseased bark of dead *trees*.

and Hinds, T. E. 1956. HYPOXYLON CANKER OF ASPEN IN COLORADO. U. S. Dep. Agric. Plant Dis. Repr. 40(2): 157-S. 6 refs.

Hypoxylon *pruinatum* on *Populus tremuloides*, reported for *the* first time in Colorado in 1955.

Day, M. W., and Strong, F. C. 1959. A STUDY OF HYPOXYLON [PRUINATUM] CANKER ON ASPEN [POPULUS TREMULOIDES]. Quart. Bull. Mich. Agric. Exp. Sta. 41(4): 870-7.

Graham, S. A., and Harrison, R. P. 1954. INSECT ATTACKS AND HYPOXYLON INFECTIONS IN ASPEN. J. For. 52(10): 741-3.

In ca. 95% of 138 Hypoxylon *pruinatum* cankers on *the* main stems of *Populus tremuloides* and *P. grandidentata* the original seat of infection was insect damage (*Saperda calcarata* 30%, *Dicerca tenebrica* 15, *Agrius* 15, Lepidoptera 14). *Silvicultural control is suggested*.

Hinds, T. E. 1962. INOCULATIONS WITH THE SOOTY-BARK CANKER FUNGUS ON ASPEN. U. S. Dep. Agric. Plant Dis. Repr. 46(1): 57-8. 2 refs.

Inoculation *experiments on Populus tremuloides confirmed that* Cenangium *singulare is the cause of* sooty-bark canker.

Shea, K. R., and Kuntz, J. E. 1955. EFFECTIVE INOCULATIONS OF ASPEN WITH HYPOXYLON PRUINATUM. Abstr. in Phytopathology 46(1): 26.

Stoeckeler, J. H. 1955. DEER, MICE AND HARES DAMAGE YOUNG ASPEN AND PAPER BIRCH PLANTINGS IN NORTHEASTERN WISCONSIN. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 441, 1 p. Most of *the loss in the first 3 years was due to* girdling by *Microtus pennsylvanicus*.

[U.S.A.: Lake St. For. Exp. Sta.] 1959. [INSECT ATTACK ON ASPEN AND HYPOXYLON [PRUINATUM?].] Rep. U. S. For. Serv. Lake St. For. Exp. Sta. 1958: 38-9.

[U.S.A.: Rocky Mt. For. Exp. Sta.] [1962.] ASPEN CANKERS ARE WIDESPREAD BUT NOT ABUNDANT. Rep. U.S. For. Serv. Rocky Mt. For. Range Exp. Sta. 1961: 23-6.

Wood, F. A. 1962. A STUDY OF THE EPIPHYTOLOGY OF HYPOXYLON CANKER OF ASPEN. Abstr. of thesis, in Dissert. Abstr. 22(11): 3805. [Univ. Minn.]

Discusses the seasonal periodicity of canker growth, fungus development and ascopore ejection, the effect of bacteria on ascospore germination and its possible significance in nature, a

technique of inoculating stem sections and its use in studying natural infection, and the production of conidia by single *ascospore* lines.

_____ and French, D. W. 1960. BACTERIA IN THE PERITHECIA OF *HYPOXYLON PRUINATUM* AND THEIR EFFECT ON ASCOSPORE GERMINATION AND DEVELOPMENT. Abstr. in *Phytopathology* **50**(9): 659.

_____ and French, D. W. 1962. EJECTION OF ASCOSPORES BY *HYPOXYLON PRUINATUM* IN MINNESOTA. Abstr. in *Phytopathology* **52**(1): 33.

_____ and French, D. W. 1963. CERATOCYSTIS FIMBRIATA, THE CAUSE OF A STEM CANKER OF QUAKING ASPEN. *For. Sci.* **9**(2): 232-5. 7 refs.

416.4/5

Ewan, H. G. 1960. THE POPLAR BORER IN RELATION TO ASPEN STOCKING. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 580, 2 pp. 1 ref.

416.5

Davidson, R. W., and Hinds, T. E. 1958. UNUSUAL FUNGI ASSOCIATED WITH DECAY IN SOME FOREST TREES IN COLORADO. *Phytopathology* **48**(4): 216-8. 4 refs.

Ethridge, D. E. 1961. FACTORS AFFECTING BRANCH INFECTION IN ASPEN. *Canad. J. Bot.* **39**: 799-816. 8 refs. (*Contr. For. Ent. Path. Br. Dep. For. Can.* No. 724.)

_____ and Laut, J. 1958. FUNGI ASSOCIATED WITH LIVING AND DEAD BRANCHES OF POLE-SIZED ASPEN. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. **14**(4): 2-3.

Hinds, T. E. 1963. EXTENT OF DECAY ASSOCIATED WITH FOMES IGNIARIUS SPOROPHORES IN COLORADO ASPEN. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. Res. Note No. RM-4, 4 pp. 7 refs.

McKay, H. H., and Lentz, P. L. 1960. DESCRIPTIONS OF SOME FUNGI ASSOCIATED WITH FOREST TREE DECAY IN COLORADO. *Mycopathologia et Mycologia Applicata*, Den Haag **13**(4): 265-86. 26 refs. [E.e.]

Describes basidiocarps and cultures of four fungi already discussed, plus *Peniophora rufa* [on *Populus tremuloides*]. *Picea engelmannii* is reported as additional host for all three conifer fungi, and *Pinus contorta* for *Helicobasidium corticoides*.

Mikalajkevicius [Mikalajkevicius], V. 1962. [SOME DATA ON THE INTERRELATIONSHIPS OF PHELLINUS TREMULAE AND P. IGNIARIUS F. BETULAE, AND COMPARATIVE INVESTIGATION OF THEIR SPORULATION.] In *Botaniceskie Issledovanija* No. 2. Institut Zoologii i Botaniki, Akademii Nauk Estonskoj SSR, Tartu. Pp. 201-10. 5 refs. [Russ.est.g.]

Riley, C. G. 1952. STUDIES IN FOREST PATHOLOGY. IX. FOMES IGNIARIUS DECAY OF POPLAR. *Canad. J. Bot.* **30**(6): 710-34. 30 refs.

Silverborg, S. B. 1953. STERILE CONKS OF FOMES IGNIARIUS ON ASPEN. *Phytopathology* **43**(12): 699-700.

Three sterile conks were found on recently killed, standing *Populus tremuloides* in New York State. The fungus was identified by cultural characteristics and by comparison with known isolates of *F. igniasius* from quaking aspen.

421.1

Ghent, A. W. 1958. MORTALITY OF OVERSTORY TREMBLING ASPEN IN RELATION TO OUTBREAKS OF THE FOREST TENT CATERPILLAR [MALACOSOMA DISSTRIA] AND THE SPRUCE BUDWORM [CHORISTONEURA FUMIFERANA]. *Ecology* **39**(2): 222-32. 9 refs.

422.12

Egeberg, R., Jr. 1963. INHERENT VARIATIONS IN THE RESPONSE OF ASPEN [POPULUS TREMULOIDES] TO FROST DAMAGE. *Ecology* **44**(1): 153-6. 13 refs.

Ouellette, G. B. 1963. FROST INJURIES ON BRANCHES OF ASPEN. Bi-m. Progr. Rep. For. Ent. Path. Br. Dep. For. Can. **19**(5): 1.

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Harrison, R. P., Jr. 1960. THE INSECTS AND DISEASES OF ASPEN. Abstr. of thesis, in *Dissert. Abstr.* **20**(12): 4478-9. [Univ. Mich.]

441 FOREST WEEDS

Arend, J. L. 1953. SCRUB ASPEN CONTROL WITH BASAL SPRAYS. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 401, 1 p. Tests in lower Michigan indicated that aspen suckering can be controlled successfully when the base of the tree is thoroughly wetted to a height of 2-3 ft. with a mixture of equal parts 2,4-D and 2,4,5-T esters in diesel oil (12 lb. acid to 100 gal. oil) applied after full leaf development in late June, July, and August.

Day, M. W. 1961. A TRIAL OF SEVERAL SILVICIDES ON RED MAPLE, ASPEN, AND WHITE PINE. *Quart. Bull. Mich. Agric. Exp. Sta.* **44**(1): 27-31.

_____ Hammer, C. L., and Panshin, A. J. 1952. PRELIMINARY OBSERVATIONS ON THE EFFECT OF 2,4-D AND 2,4,5-T ON ASPEN. *Quart. Bull. Mich. Agric. Exp. Sta.* **34**(3): 266-74. 3 refs.

Shiue, C. -J. 1957. THE ANATOMICAL AND PHYSIOLOGICAL EFFECTS OF CHLOROPHENOXYACETIC ACID DERIVATIVES ON TREMBLING ASPEN (POPULUS TREMULOIDES MICHX.) WITH SPECIAL REFERENCE TO THE APPLICATION OF SUCH CHEMICALS AS DEBARKING AGENTS. Abstr. of thesis, in *Dissert. Abstr.* **17**(6): 1177. [Univ. Minn.]

_____ Hossfeld, R. L., and Rees, L. W. 1958. ABSORPTION AND TRANSLLOCATION OF 2,4,5-TRICHLOROPHENOXYACETIC ACID DERIVATIVES IN QUAKING ASPEN. *For. Sci.* **4**(4): 319-24. 8 refs.

_____ Rees, L. W., and Brown, R. M. 1958. SOME ANATOMICAL AND PHYSIOLOGICAL CHANGES IN QUAKING ASPEN [P. TREMULOIDES] INDUCED BY BARK REMOVAL WITH 2,4,5-T. *For. Sci.* **4**(3): 212-8. 7 refs.

Worley, D. P., Bramble, W. C., and Byrnes, W. R. 1954. EFFECT OF SEASONAL BASAL SPRAYS ON ROOT SUCKERING OF ASPEN. *Proc., 8th Ntheast. Weed Control Conf.*, pp. 447-52. 3 refs.

443 FUNGI AND BACTERIA

Brown, R. M. 1934. STATISTICAL ANALYSES FOR FINDING A SIMPLE METHOD FOR ESTIMATING THE PERCENTAGE HEART ROT IN MINNESOTA ASPEN. *J. Agric. Res. Rep.* **49**(10): 929-42.

Gruenhagen, R. H. 1943. LIFE HISTORY OF *HYPOXYLON PRUINATUM* IN RELATION TO PATHOGENICITY ON ASPEN. Abstr. in *Phytopathology* **33**(12): 1112.

_____ 1945. *HYPOXYLON PRUINATUM* AND ITS PATHOGENESIS ON POPLAR. *Phytopathology* **35**(1): 72-89. Bblg.

Hirt, R. R., and Hopp, H. 1942. RELATION OF TUBE LAYERS TO AGE IN SPOROPHORES OF FOMES IGNIARIUS ON ASPEN. *Phytopathology* **32**(2): 176-8.

Horton, G. S., and Hendee, C. 1934. A STUDY OF ROT IN ASPEN ON THE CHIPPEWA NATIONAL FOREST. *J. For.* **32**(4): 493-94.

Phelps, V. H. 1943. HEART ROT OF ASPEN. *Silv. Leaflet. Dom. For. Serv. No.* 18, 2 pp.

Seaver, F. J. 1945. SCLEROTINIA BIFRONS. *Mycologia* **37**(6): 641-7.

443.3

Dance, B. W. 1961. SPORE DISPERSAL IN POLLACCIA RADIOSA (LIB.) BALD. AND CIF. *Canad. J. Bot.* **39**(6): 1429-35. 3 refs.

Davidson, R. W., Hinds, T. E., and Hawksworth, F. G. 1959. DECAY OF ASPEN IN COLORADO. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta., Sta. Pap. No. 45, 14 pp. 10 refs.

French, D. W., and Oshima, N. 1959. HOST BARK CHARACTERISTICS AND INFECTION BY *HYPOXYLON PRUINATUM* (KLOT.) CKE. *For. Sci.* **5**(3): 255-8. 1 ref.

Keener, P. D. 1953. UNUSUAL NUMBERS OF SPOROPHORES OF A WOOD-ROT FUNGUS ON TRUNKS OF POPULUS TREMULOIDES VAR. AUREA. U. S. Dep. Agric. Plant Dis. Repr. **37**(3): 164-5.

Presents counts of sporophores of *Fomes igniarius* in the San Francisco Mountains of Arizona, where they were observed in abnormal numbers on *P. tremuloides* var. aurea.

Marks, G. C., Berbee, J. G., and Riker, A. J. 1962. GLOEOSPORIUM SHOOT BLIGHT AND DEFOLIATION OF TREMBLING ASPEN. Abstr. in *Phytopathology* **52**(8): 741-2.

Wall, R. E. 1962. EFFECTS OF EXTRACTS FROM DEAD BRANCHES OF TREMBLING ASPEN ON THE GERMINATION OF SPORES OF FOMES IGNIARIUS. Abstr. in Phytopathology 52(1): 31.

45 1 MAMMALS

Packard, F. M. 1942. WILDLIFE AND ASPEN IN ROCKY MT. NATIONAL PARK, COLORADO. Ecology 23(4): 478-82. Bblg.

451.2

Westell, C. E., Jr. 1956. ECOLOGICAL RELATIONSHIPS BETWEEN DEER AND FORESTS IN LOWER MICHIGAN. Proc. Soc. Amer. For. 1955: 130-2. 6 refs.

Summarizes the results of studies on the effect of deer browsing on aspen regeneration, and game management in Michigan.

453 INSECTS

Barter, G. W., and Brown, W. J. 1949. ON THE IDENTITY OF AGRILUS ANXIUS GORY AND SOME ALLIED SPECIES (COLEOPTERA: BUPRESTIDAE). Canad. Ent. 81(10): 245-9. (Contr. Div. Ent. Dep. Agric. Can. No. 2633.)

Graham, S. A., and Mason, R. R. 1958. INFLUENCE OF WEATHER ON POPLAR BORER [SAPERDA CALCARATA] NUMBERS. Mich. For. No. 20, 3 pp. 2 refs.

Confirms previous findings [cf. Graham and Harrison, 1954, P. tremuloides, 416.4] that precipitation has a definite influence on subsequent beetle populations. The effect of high temperatures was also noted: in the high nineties they cause beetle mortality that offsets the favorable effect of dry weather.

Henson, W. R. 1954. A SAMPLING SYSTEM FOR POPLAR INSECTS. Canad. J. Zool. 32: 421-33. 7 refs. (Contr. Div. For. Biol. Dep. Agric. Can. No. 172.)

1958. THE EFFECTS OF RADIATION ON THE HABITAT TEMPERATURES OF SOME POPLAR-INHABITING INSECTS. Canad. J. Zool. 36: 463-78. 10 refs.

Osgood, E. A., Jr. 1963. POPULATION DYNAMICS OF INSECTS ON SUCKERS OF QUAKING ASPEN, POPULUS TREMULOIDES MICHX., WITH SPECIAL EMPHASIS ON THE SPOTTED POPLAR APHID, APHIS MACULATAE OESTLUND, AND THE WILLOW SHOOT SAWFLY, JANUS ABBREVIATUS (SAY). Abstr. of thesis, in Dissert. Abstr. 24(1): 41-2. [Univ. Minn.]

Peterson, L. O. T. [n.d.] SOME ASPECTS OF POPLAR BORER, SAPERDA CALCARATA SAY, (CERAMBYCIDAE) INFESTATIONS UNDER PARK-BELT CONDITIONS. Contrib. Div. Ent. Dep. Agric. Can. No. 2528, 6 pp.

Rose, A. H., and Smereka, E. P. 1959. INSECTS ON TREMBLING ASPEN [POPULUS TREMULOIDES]. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 15(2): 1-2.

A study is being conducted in N.W. Ontario. The most abundant species are Gonioctena americana, Rhabdophaga sp., Enargia decolor, Xylomyges dolosa, Epinotia nisella, and Sciaphila duplex.

Wong, H. R. 1957. SAWFLIES OF THE GENUS PLATYCAMPUS SCHIODTE ON TREMBLING ASPEN IN THE CANADIAN PRAIRIES. Bi-m. Progr. Rep. Div. For. Biol. Dep. Agric. Can. 13(4): 2.

Two species found feeding on the foliage of Populus tremuloides have been tentatively identified as Platycampus americanus and P. albostigmus.

5 FOREST MENSURATION

523.1

[U.S.A.: Cent. St. For. Exp. Sta.] [1948.] [BARK THICKNESS OF RED OAK AND ASPEN.] Rep. U. S. For. Serv. Cent. St. For. Exp. Sta. 1947: 26.

524.12

Stoehr, H. A. 1954. STAND CONDITIONS AFFECTING FORM FACTOR IN TREMBLING ASPEN. Abstr. of thesis, in Dissert. Abstr. 14(8): 1122. [Univ. Mich.]

1955. STEM TAPER OF TREMBLING ASPEN. For. Sci. 1(3): 222-6. 12 refs.

524.3 14

Golding, D. L., and Hall, O. F. 1961. TESTS OF PRECISION OF CUBIC-FOOT TREE-VOLUME EQUATIONS. For. Chron. 37(2): 123-32.

524.315

MacLeod, W. K. 1952. AVERAGE DIAMETER, A BASIS FOR CRUISING SECOND GROWTH. Res. Note U.B.C. For. Club No. 6, 7 pp. 5 refs.

Peterson, G. 1961. VOLUME TABLES FOR ASPEN IN COLORADO. U. S. For. Serv. Rocky Mt. For. Range Exp. Sta. Res. Note No. 63, 4 pp. 2 refs.

Three gross vol. tables in 1-in. diam. classes giving bd.-ft. vol. to G- and 8-in., and cu.-ft. vol. to 4-in. top diam. u.b., based on measurements of Populus tremuloides felled for a study of decay [see Davidson, Hinds, and Hawksworth, 1959, P. tremuloides, 443.31. U.b.-o.b. diam. relationships were computed.

526 LOG MEASUREMENT. "SCALING"

Gevorkiantz, S. R., and Zehngraft, P. 1943. SCALING ASPEN BOLTS BY THE CORD. J. For. 41(6): 450-2.

532 QUANTITY AND AREA OF FOLIAGE

Henson, W. R. 1954. A SAMPLING SYSTEM FOR POPLAR INSECTS. Canad. J. Zool. 32: 421-33. 7 refs. (Contr. Div. For. Biol. Dep. Agric. Can. No. 172.)

54 ASSESSMENT OF SITE QUALITY

Heinselman, M. L., and Zasada, Z. A. 1955. A REVIEW OF LITERATURE RELATING TO QUAKING ASPEN [POPULUS TREMULOIDES] SITES. U. S. For. Serv. Lake St. For. Exp. Sta., Sta. Pap. No. 32, 61 pp. 92 refs.

Summarizes available data for Minnesota.

Lafond, A. 1956. LE RENDEMENT DE QUELQUES TYPES DE TREMBLE SUR LA COTE NORD. [THE YIELD OF VARIOUS TYPES OF ASPEN [STANDS] ON THE NORTH COAST [OF QUEBEC].] Abstr. in Ann. ACFAS 22: 54. [F.]

A study based on more than 450 sample plots and more than 800 stem analyses indicated that in three forest types examined, differences in the structure and composition of the vegetation corresponded to differences in yield of conifers or aspen, though total site productivity and site class was the same.

Losee, S. T. B. 1954. SITE CLASSIFICATION AT ABITIBI WOODLANDS LABORATORY. Pulp Pap. Mag. Can. 55(11): 168-174. (Woodl. Sect. Index Canad. Pulp Pap. Ass. No. 1404 (E-21.)

Using bases designed to cover silvicultural conditions generally as well as the probable performance of various species (ground cover and ht. growth of black spruce, jack pine, and aspen) gives a tentative table showing three levels of fertility and five of soil moisture. The seven sites so far determined are described in detail. Probably two more will follow.

Wilde, S. A., and Pronin, D. T. 1950. GROWTH OF TREMBLING ASPEN IN RELATION TO GROUND WATER AND SOIL ORGANIC MATTER. Proc. Soil Sci. Soc. Amer. 1949, Vol. 14: 345-7. 5 refs.

541 BASED ON HEIGHT, DIAMETER, VOLUME, ETC.

Gevorkiantz, S. R. 1956. SITE INDEX CURVES FOR ASPEN IN THE LAKE STATES. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Note No. 464, 2 pp. 1 ref.

Meyer, D. 1956. THE RELATION OF SOIL HORIZON TEXTURE AND ACIDITY TO THE SITE INDEX OF ASPEN IN NORTHERN MINNESOTA. Minn. For. Note No. 52, 2 pp. 1 ref.

A study involving 36 sample plots on sites varying greatly in

drainage, topography and climate, showed highly significant correlations between site index and the silt and clay content of B and C horizons, and between site index and pH of the C horizon (the latter being correlated with its silt and clay content).

Stoeckeler, J. H. 1956. SOIL FACTORS AFFECTING THE GROWTH OF QUAKING ASPEN FORESTS IN THE LAKE STATES. Abstr. of thesis, Univ. Minn., St. Paul. 3 pp.

————— 1960. SOIL FACTORS AFFECTING THE GROWTH OF QUAKING ASPEN FORESTS IN THE LAKE STATES. Tech. Bull. Minn. Agric. Exp. Sta. No. 233, 43 pp. 108 refs.

Strothmann, R. O. 1960. EVALUATING THE GROWTH POTENTIAL OF ASPEN LANDS IN NORTHERN MINNESOTA. U. S. For. Serv. Lake St. For. Exp. Sta., Sta. Pap. No. 86, 20 pp. 4 refs.

[U.S.A.: Lake St. For. Exp. Sta.][1955.] SOME ASPEN SITE FACTOR RELATIONSHIPS DISCOVERED. Rep. U. S. For. Serv. Lake St. For. Exp. Sta. 1954: 12.

Voigt, G. K., Heinselman, M. L., and Zasada, Z. A. 1957. THE EFFECT OF SOIL CHARACTERISTICS ON THE GROWTH OF QUAKING ASPEN IN NORTHERN MINNESOTA. Proc. Soil Sci. Soc. Amer. 21(6): 649-52. 22 refs.

551 IN SINGLE TREES WITH ANNUAL RINGS

Kirby, C. L. 1953. ACCURACY OF RING COUNTS ON POPLAR. Silv. Leaflet. For. Br. Can. No. 85, 2 pp.

Eighty-seven percent of ring counts in the field on 23 representative sample discs of *P. tremuloides* and *P. balsamifera* were below those made in the laboratory. This may be attributed to indistinct demarcation between early and late wood and to the presence of decay.

56 INCREMENT; DEVELOPMENT AND STRUCTURE OF STANDS

Downing, G. L. 1960. SOME SEASONAL GROWTH DATA FOR PAPER BIRCH, WHITE SPRUCE AND ASPEN NEAR FAIRBANKS, ALASKA—1958. Tech. Note Alaska For. Res. Cent. No. 46, 3 pp. 1 ref.

Birch leader growth started in late May and continued til early July (43-47 days). Radial growth of all three species started in early June and ended in mid-July. Mean leader growth per tree (birch) was 4.70 in. at Richardson Highway (a) and 0.82 in. at Elliott Highway (b). Mean total radial growth at (a) was: birch 0.012 in., spruce 0.028 in., and at (b) birch 0.002 in., aspen 0.030 in.

Kirby, C. L. 1962. THE GROWTH AND YIELD OF WHITE SPRUCE-ASPEN STANDS IN SASKATCHEWAN. Tech. Bull. For. Br. Sask. No. 4, 58 pp. 48 refs.

6 FOREST MANAGEMENT

61 FOREST MANAGEMENT: GENERAL, THEORY AND PRINCIPLES

Zasada, Z. A. 1950. ASPEN MANAGEMENT PROBLEMS OF THE LAKE STATES. U. S. For. Serv. Lake St. For. Exp. Sta. Misc. Rep. No. 10, 23 pp. 98 refs.

A review of literature.

Zehngraff, P. 1947. POSSIBILITIES OF MANAGING ASPEN. U. S. For. Serv. Lake St. Aspen Rep. No. 21, 23 pp. Bblg.

————— 1949. ASPEN AS A FOREST CROP IN THE LAKE STATES J. For. 47(7): 555-65. 14 refs.

644.5 '6

[U.S.A.: Timberman.] 1958. DEER AND PULP MILLS COMPETE. Timberman 59 (8): 44-6.

651 74

Zasada, Z. A. 1952 DOES IT PAY TO THIN YOUNG ASPEN? J. For. 50(10): 747-8.

Applies to *Piceaglauca/Populus tremuloides* stands undisturbed by fire or felling, with emphasis on the growth and yield of *P. glauca*. Subjects covered include prediction of increment and deduction for cull. Shelterwood and strip felling of *P. glauca* appear to be promising ways of obtaining the desired regeneration of that species.

————— Bailey, W. S., and Gilmour, J. R. 1957. THE GROWTH AND YIELD OF ASPEN [POPULUS TREMULOIDES] IN SASKATCHEWAN. Tech. Bull. For. Br. Sask. No. 3, 67 pp. 14 refs.

Robinove. 1931. GROWTH RATE OF ASPENS IN MICHIGAN. Biol. Abstr. 5: 11800.

Tunstall, G. 1945. GROWTH OF ASPEN: PROJECT M.S.-45 Silv. Res. Note Dom. For. Serv. No. 77, 2 pp.

561.21

Kozlowski, T. T., and Winget, C. H. 1962. SEASONAL GROWTH AND DEVELOPMENT OF ASPEN STEMS. For. Res. Note Wis. Coll. Agric. No. 87, 4 pp. 15 refs.

561.24

Ghent, A. W. 1954. THE TREATMENT OF DECAYED WOOD FROM DEAD TREMBLING ASPEN TREES FOR GROWTH-RING ANALYSIS. For. Chron. 30(3):280-3.

562.2

Hubbard, J. W. 1956. GROWTH AND MORTALITY IN A NORTHERN MINNESOTA FOREST. Minn. For. Note No. 50, 2 pp.

Data derived from remeasurement, after 5 years, of 558 permanent 1/5-acre plots are presented and analyzed. A separate growth tabulation was made for *Populus tremuloides*, which has an almost straight-line growth curve, and *Abies balsamea*, which grows slowly up to 6 in. d.b.h., then accelerates greatly until about 10 in. d.b.h., when the growth rate levels off.

566 YIELD TABLES AND THEIR CONSTRUCTION

Plonski, W. L. 1956. NORMAL YIELD TABLES FOR BLACK SPRUCE, JACK PINE, ASPEN AND WHITE BIRCH IN NORTHERN ONTARIO. Rep., Div. For. Mgmt. Ont. Dep. Lds. For. No. 24, 40 pp.

Zehngraff, P. 1948. YIELDS OF ASPEN IN UNMANAGED STANDS. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 300, 1 p.

567 STAND TABLES

[U.S.A.: Lake St. For. Exp. Sta.] 1931. ASPEN NORMAL STAND TABLES. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 71.

Analyzes costs and profits from thinning young stands of *Populus tremuloides*.

676.13

Zasada, Z. A., and Zehngraff, P. J. 1948. LOGGING COSTS OF ASPEN (POPULUS TREMULOIDES). U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 304, 1 p.

71 MARKETING OF FOREST PRODUCTS: GENERAL

Zasada, Z. A. 1949. MARKETING OF ASPEN (POPULUS TREMULOIDES). U. S. For. Serv. Lake St. Aspen Rep. No. 20, 10 pp. 6 refs

72 PRICES

Chase, C. D. 1947. ASPEN AVAILABILITY AND SUPPLY. U. S. For. Serv. Lake St. Aspen Rep. No. 2, 15 pp. Bblg.

8 FOREST PRODUCTS AND THEIR UTILIZATION

Eades, H. W. 1940. REPORT ON A SHIPMENT OF ASPEN LOGS MADE TO SOUTH AFRICA. For. Prod. Lab., Dom. For. Serv., Can. 4 pp.

Johnson, R. P. A., and others. 1930. ASPEN: AVAILABILITY, PROPERTIES AND UTILIZATION. Tech. Bull. Minn. Agr. Exp. Sta. No. 70: 72.

810 GENERAL INFORMATION ON WOOD

Anonymous. 1939. CANADIAN ASPEN. Wood Inform. Series Timb. Comm. Eastern Can. No. 48, 1 p.

Betts, H. S. 1943. AMERICAN WOODS: ASPEN. U. S. For. Serv. 9 pp. Bblg.

Zasada, Z. A. 1947. ASPEN PROPERTIES AND USES. U.S. For. Serv. Lake St. Aspen Rep. No. 1, 9 pp.

81 1.12

Ribi, E. 1953. ELECTRON MICROSCOPIC INVESTIGATIONS OF THE CELL WALL ORGANIZATION OF WOOD. Exp. Cell. Res., New York 5(1): 161-72. 24 refs.

Presents a series of *electron micrographs* of sections of wood of *Ochromalagopus* and *Populus tremuloides* and comments on the organization of cellulose *fibrils in the cell walls*.

81 1.156

Buijtenen, J. P. van. [1962.] SAMPLING FIBER LENGTHS IN QUAKING ASPEN. Proc., 5th World For. Congr., Seattle 1960, Vol. 3 (Sect. 6B): 1367-9. 5 refs. [E.f.span.]

A study on 10-mm. increment cores at Wisconsin and Michigan. *Fibre* length increased with the logarithm of age from *the* pith; it was not *related* to direction, but fluctuated at random. The correlation coefficient of fibre measurements *from* pulped b.h. cores and from whole-tree pulps of 2.5 trees was 0.8.

Valentine, F. A. 1963. VARIATION IN FIBER LENGTH IN POPULUS TREMULOIDES CLONES. [Pap.] FAO World Consult. For. Genet., Stockh. 1963 No. FAO/FORGEN 63/-7/4. 8 pp. 6 refs.

Changes in fibre length were determined across the radius of *the* stem for five trees *in each of four* natural clones. The results indicate that fibre-length increases across *the stem* are more closely related to *annual ring* number than to distance of the *sample from the* pith.

81 1.7

Hossfeld, R. L., and Kaufert, F. H. 1957. STRUCTURE AND COMPOSITION OF ASPEN BARK. For. J. 7(12): 437-9. 12 refs.

Discusses physical properties, morphology and anatomy, chemical composition [cf. *Browning* and *Bublitz*, 1953, *P. tremuloides*, 813.21, including *the* distribution of components in the tissue elements, pulping characteristics, and potential other uses. Pulping results are poor. At present *fibres* are only included in low-grade products *where* barking before pulping *would not be economically* justified.

812 PHYSICAL AND MECHANICAL PROPERTIES

Johnson, R. P. A. 1947. MECHANICAL PROPERTIES OF ASPEN (POPULUS TREMULOIDES). U. S. For. Serv. Lake St. Aspen Rep. No. 7, 16 pp.

813.31

Valentine, F. A. 1962. NATURAL VARIATION IN SPECIFIC GRAVITY IN POPULUS TREMULOIDES IN NORTHERN NEW YORK. Proc., 9th Ntheast. For. Tree Impr. Conf., Syracuse 1961: 17-24. 3 refs.

Study of 200 *randomly* selected *trees* demonstrated that *a relatively* large variation in sp. gr. is *present in the P. tremuloides* population of this area.

812.7

Clausen, V. H., and others. 1949. DEVELOPMENT OF COLLAPSE IN ASPEN LUMBER. Proc. U. S. For. Prod. Res. Soc. 3: 460-8. 7 refs.

812.8

Davis, E. M. 1947. MACHINING AND RELATED PROPERTIES OF ASPEN (POPULUS TREMULOIDES). U. S. For. Serv. Lake St. Aspen Rep. No. 8, 8 pp.

813 WOOD CHEMISTRY

Pearl, I. A., and Beyer, D. L. 1960. STUDIES ON THE CHEMISTRY OF ASPENWOOD [POPULUS TREMULOIDES]. V. AN INVESTIGATION OF VARIOUS ASPEN SPENT LIQUORS AS SOURCES OF P-HYDROBENZOIC ACID AND OTHER COMPOUNDS. Tappi 43(6): 568-72. 8 refs. [Cf. Pearl and Beyer, 1959, *P. tremuloides*, 813.11.1]

_____ and Beyer, D. L. 1960. STUDIES ON THE CHEMISTRY OF ASPENWOOD. "I. PRODUCTS OF ALKALINE HYDROLYSIS OF VARIOUS PORTIONS OF THE ASPEN TREE. Tappi 43(7): 611-3. 8 refs.

_____ and Beyer, D. L. 1963. STUDIES ON THE CHEMISTRY OF ASPENWOOD. XVI. FURTHER STUDIES ON THE ETHER EXTRACTIVES OF SPENT SULFITE LIQUOR FROM AUTHENTIC QUAKING ASPENWOOD [POPULUS TREMULOIDES]. Tappi 46(8): 502-5. 8 refs.

Reports on *the* isolation of substantial amounts of *naringenin*, and also of two other *related* materials with *flavan* and *flavone* structures. The occurrence of such compounds, *never* previously reported from *aspenwood*, *may be of* taxonomic importance.

_____ Beyer, D. L., and Justman, O. 1962. STUDIES ON THE CHEMISTRY OF ASPENWOOD. XI. THE ETHER-SOLUBLE PORTION OF SPENT SULFITE LIQUOR FROM AUTHENTIC QUAKING ASPENWOOD. Tappi 45(2): 107-13. 6 refs.

Ritter, G. J., and Hossfeld, R. L. 1947. CHEMICAL UTILIZATION OF ASPEN. U. S. For. Serv. Lake St. Aspen Rep. No. 4, 19 pp. 12 refs.

Stanek, D. A. 1958. A STUDY OF THE LOW-MOLECULAR WEIGHT PHENOLS FORMED UPON THE HYDROLYSIS OF ASPENWOOD. Tappi 41(10): 601-9. 29 refs.

Seven crystalline aromatic compounds were isolated from *the* ether-soluble portion of *the* hydrolysis liquors obtained when extracts of *Populus tremuloides* were treated with water at 170° C. Evidence was obtained that these *seven* compounds might *have* been derived from *P. tremuloides* lignin.

Sultze, R. F. 1957. A STUDY OF THE DEVELOPING TISSUES OF ASPENWOOD. Tappi 40(12): 985-94. 34 refs.

813.1

Sergeeva, V. N., and Domburgs, G. 1959. A THERMOGRAPHIC INVESTIGATION OF THE THERMAL DECOMPOSITION OF LIGNOCELLULOSE. Trud. Inst. Lesohoz. Probl., Riga No. 17: 83-92. [Russ.?] From abstr. in Chem. Abstr. 54(10):10314-5. 1960.

Gives results of investigations made to ascertain the course of decomposition of cellulose from *aspen lignocellulose* as a function of various factors, *viz. type of* thermal treatment, state of *starting* material (e.g., particle size), and *the content of pentosans or other easily hydrolysable* carbohydrates, *under* conditions ensuring maximum *glucosan* yield.

Springer, E. L. 1961. RATE STUDIES OF THE HYDROTROPIC DELIGNIFICATION OF ASPEN WOOD [WITH ACIDIFIED SOLUTIONS OF THE HYDROTROPIC SALT NAXYLENESULFONATE]. Abstr. of thesis, in Dissert. Abstr. 22(6): 1930. [Univ. Wis.]

813.1 1

Baylis, P. E. T., and Pepper, J. M. 1958. THE ISOLATION OF LIGNIN FROM ASPEN WOOD. Abstr. in Chemistry in Can., Ottawa 10(4): 62.

A *new type of* lignin was isolated, by acidolysis of pre-extracted wood flour, and some of its chemical properties were studied. The *aspen* lignin and that isolated previously from *spruce* by a similar technique were compared.

Brink, D. L. 1954. THE COOKING PROCESS: XIII. THE EFFECT OF AQUEOUS SOLUTIONS OF PURE SODIUM HYDROSULFIDE ON THE CONSTITUENTS OF [ASPEN] WOOD. Abstr. of thesis, in Dissert. Abstr. 14(6): 928-9. [Univ. Minn.]

The nature of the process and the substances obtained are discussed and it is suggested, from the character of the residual wood and the nature of the identifiable low molecular weight degradation products that aqueous solutions of pure NaHS are specific agents for the cleavage of protolignin linkages in aspen.

Buchanan, M. A., and others. 1949. NATIVE LIGNIN. II. NATIVE ASPEN LIGNIN. *J. Amer. Chem. Soc.* 71(4): 1297-9. 8 refs.

Busche, L. R. 1960. THE KLASON LIGNIN DETERMINATION AS APPLIED TO ASPENWOOD WITH SPECIAL REFERENCE TO ACID-SOLUBLE LIGNIN. Abstr. of thesis, in Dissert. Abstr. 21(1): 34. 1 ref. [Inst. Pap. Chem.]

Kavanagh, K. R., and Pepper, J. M. 1955. THE ALKALINE NITRO-BENZENE OXIDATION OF ASPEN WOOD AND LIGNIN MODEL SUBSTANCES. *Canad. J. Chem.* 33(1): 24-30. 15 refs. Yields of vanillin and syringaldehyde from aspen wood and from model substances are compared and the results discussed with respect to the chemistry of aspen lignin.

Mugg, J. B. 1959. THE METHANOL-EXTRACTABLE MATERIALS IN NEWLY FORMED ASPENWOOD [POPULUS TREMULOIDES]. *Tappi* 42(4): 289-94. 25 refs.

Pearl, I. A. 1957. THE NATURE OF ASPEN LIGNIN. *For. Prod. J.* 7(2): 88-90. 1 ref.

——— and Beyer, D. L. 1957. NEW DEVELOPMENTS IN THE CHEMISTRY OF ASPEN LIGNIN. *Tappi* 40(1): 45-54. 7 refs. The average OCH, content of *Populus tremuloides* lignin was found to be much less than the commonly accepted figure of 21%. Results of fractionation by means of isopropanol, ethyl ether, and ion-exclusion processes are presented.

——— and Beyer, D. L. 1959. STUDIES ON THE CHEMISTRY OF ASPEN WOOD. I. OXIDATION OF ASPEN LIGNOSULPHATES WITH ALKALINE CUPRIC AND SILVER OXIDE. *Tappi* 42(9): 800-4. 17 refs.

——— and Beyer, D. L. 1962. STUDIES ON THE CHEMISTRY OF ASPENWOOD [POPULUS TREMULOIDES]. IX. P-HYDROXYBENZOIC ACID IN ASPEN KLASON LIGNIN. *J. Organ. Chem.* 27(6): 2287. 3 refs.

——— and Busche, L. R. 1960. STUDIES ON THE CHEMISTRY OF ASPENWOOD. XI. THE KLASON LIGNIN DETERMINATION AS APPLIED TO ASPENWOOD WITH SPECIAL REFERENCE TO ACID-SOLUBLE LIGNIN. *Tappi* 43(12): 961-70. 47 refs.

——— and Busche, L. R. 1960. STUDIES ON THE CHEMISTRY OF ASPENWOOD [POPULUS TREMULOIDES]. XII. STUDIES ON THE PREPARATION OF MILLED WOOD LIGNIN FROM QUAKING ASPENWOOD. *Tappi* 43(12): 970-4. 19 refs.

Describes the method of preparing milled wood lignin, using a vibratory ball mill specially constructed for sub-zero grinding temperatures, and presents the data obtained from fractions (isolated at -78°C.) examined on the basis of chemical analyses and ultraviolet and infra-red spectra. [From authors' summary].

——— Beyer, D. L., and Whitney, D. 1961. STUDIES ON THE CHEMISTRY OF ASPENWOOD. XV. FURTHER STUDIES ON THE OXIDATION OF ASPEN LIGNO-SULFONATES WITH ALKALINE CUPRIC AND SILVER OXIDES. *Tappi* 44(7): 479-84. 6 refs.

Pepper, J. M., and Hagerman, D. C. 1954. THE ISOLATION AND OXIDATION OF ASPEN LIGNINS. *Canad. J. Chem.* 32(5): 614-27. 17 refs.

——— and Siddiqueullah, M. 1961. THE EFFECT OF INITIAL ACID CONCENTRATION ON THE LIGNIN ISOLATED BY THE ACIDOLYSIS OF ASPEN WOOD. *Canad. Chem.* 39(7): 1454-61. 15 refs.

Lignin fractions isolated by the methoxylated benzene extract of aspen wood. The yields, elemental analysis, infrared absorption spectra, and the yields of vanillin and p-coumaric acid.

——— 1959. THE ISOLATION AND PROPERTIES OF LIGNIN OBTAINED BY THE ACIDOLYSIS OF SPRUCE AND ASPEN WOODS IN DIOXANE-WATER MEDIUM. *Canad. J. Chem.* 37(8): 1241-8. 15 refs. [Picea abies and Populus tremuloides.]

——— Brounstein, C. J., and Shearer, D. A. 1951. STUDIES ON LIGNIN BY MEANS OF CATALYTIC HYDROGENATION OF ASPEN WOOD AND WHEAT STRAW. *J. Amer. Chem. Soc.* 73(7): 3316-9. 10 refs.

813.14

Jones, J. K. N., and Wise, L. E. 1952. THE HEMICELLULOSES PRESENT IN ASPEN WOOD (POPULUS TREMULOIDES). PART I. *J. Chem. Soc.*, July, pp. 2750-6.

——— and Wise, L. E. 1952. THE HEMICELLULOSES PRESENT IN ASPEN WOOD (POPULUS TREMULOIDES). PART II. *J. Chem. Soc.*, Sept., pp. 3389-93. 1 ref.

——— Merler, E., and Wise, L. E. 1957. THE HEMICELLULOSES PRESENT IN ASPEN WOOD (POPULUS TREMULOIDES). PART III. THE CONSTITUTION OF PENTOSAN AND HEXOSAN FRACTIONS. *Canad. J. Chem.* 35(7): 634-45. 14 refs.

Milks, J. E., and Purves, C. B. 1956. ATTEMPTED PREPARATION OF A HOMOGENEOUS HEMICELLULOSE FROM ASPEN WOOD. *J. Amer. Chem. Soc.* 78(15): 3738-44. 33 refs.

813.15

Jones, J. K. N., Purves, C. B., and Timell, T. E. 1961. CONSTITUTION OF A 4-O-METHYLGLUCURONOXILAN FROM THE WOOD OF TREMBLING ASPEN (POPULUS TREMULOIDES MICHX.). *Canad. J. Chem.* 39(5): 1059-66. 42 refs. The studies showed that the polysaccharide is similar to the 4-O-methylglucuronoxylans occurring in the wood of all arborescent angiosperms so far investigated.

813.2

Abramovitch, R. A., and Micetich, R. G. 1962. EXTRACTIVES FROM POPULUS TREMULOIDES HEARTWOOD: THE STRUCTURE AND SYNTHESIS OF TREMULONE. *Canad. J. Chem.* 40(10): 2017-22. 18 refs.

——— and Micetich, R. G. 1963. EXTRACTIVES FROM POPULUS TREMULOIDES HEARTWOOD: THE TRITERPENE ALCOHOLS. *Canad. J. Chem.* 41(9): 2362-7. 25 refs.

——— Micetich, R. G., and Smith, S. J. 1963. EXTRACTIVES FROM POPULUS TREMULOIDES (ASPEN POPLAR) HEARTWOOD. *Tappi* 46(1): 37-40. 14 refs.

Reports the isolation and characterization of a number of free fatty acids, β -sitosterol glucoside, a number of normal aliphatic hydrocarbons, three normal aliphatic alcohols, a crystalline ketone, various sterols, unsaturated alcohols, keto alcohols, and a steam-volatile fraction. Contrary to a previous report [see Pearl and Harrocks, 1961, this subject classification], β -sitosterol was present in the nonsaponifiable fraction.

Browning, B. L., and Bubltz, L. O. 1953. EXTRACTIVES OF ASPENWOOD AND BARK. *Tappi* 36(9): 418-9. 6 refs.

The ether-soluble portion of extractives is characterized by a high content of fatty acids and contributes to the formation of hardwood pitch. Seasoning decreases the ether-soluble material in both wood and bark.

Clermont, L. P. 1961. THE FATTY ACIDS OF ASPEN POPLAR, BASSWOOD, YELLOW BIRCH AND WHITE BIRCH. *Pulp Paper Mag. Can.* 62(12): T511-T514. 8 refs.

Whenever possible, each species was separated into sapwood and heartwood, and each portion extracted with ether. The extracts were fractionated into (a) free fatty acids, (b) combined fatty acids, and (c) unsaponifiable material. Results are tabulated in detail.

Harrocks, J. A. 1960. AN INVESTIGATION OF THE NEUTRAL MATERIALS FROM THE BENZENE EXTRACT OF ASPENWOOD. Abstr. of thesis, in Dissert. Abstr. 21(1): 53. 1 ref. [Inst. Pap. Chem.]

The relatively large amounts of extractives of resins in the wood, not easily removed during pulping or bleaching, may later cause such problems as pitch or loss of absorbency. Little is known of the nature of these resins, and this thesis investigates the neutral portion of the benzene extract of *Populus tremuloides*.

Pearl, I. A., and Harrocks, J. A. 1961. STUDIES ON THE CHEMISTRY OF ASPENWOOD. X. NEUTRAL MATERIALS FROM THE BENZENE EXTRACTIVES OF POPULUS TREMULOIDES. *J. Organ. Chem.* 26(5): 1578-83. 18 refs. [Cf. Pearl and Busche, 1960 (two refs.), 813.11.]

815 EFFECT OF GROWTH FACTORS ON STRUCTURE AND PROPERTIES

Wilde, S. A., and Paul, B. H. 1959. GROWTH, SPECIFIC GRAVITY, AND CHEMICAL COMPOSITION OF QUAKING ASPEN ON DIFFERENT SOIL TYPES. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. 2144, 4 pp. 6 refs.

83 TIMBER MANUFACTURING INDUSTRIES AND PRODUCTS

Fernow. 1917. THE USES OF ASPEN POPLAR. Canad. For. Mag. 13: 1185-6.

831.51

Gunderson, W. R. H. 1949. HOME-TREATED FENCE POSTS SERVE WELL. U. S. For. Serv. Lake St. For. Exp. Sta. Tech. Notes No. 325, 1 p.

832.1

Telford, C. J., and Malcolm, F. B. 1947. MILLING OF ASPEN INTO LUMBER. U. S. For. Serv. Lake St. Aspen Rep. No. 4, 9 pp.

832.15

Wallin, W. B. 1958. THE INFLUENCE AND IMPORTANCE OF DEFECTS AND LOG GRADES ON LUMBER GRADE YIELD FROM ASPEN LOGS. Abstr. of thesis, in Dissert. Abstr. 18(4): 1193. [Univ. Minn.]

832.18

Sands, W. 1947. ASPEN (POPULUS TREMULOIDES) FOR CONTAINERS. U. S. For. Serv. Lake St. Aspen Rep. No. 10, 12 pp. Bblg.

832.2

Feihl, A. O. 1958. VENEER AND PLYWOOD FROM ASPEN POPLAR. Canad. Woodworker, Toronto, Jan. 3 pp.

Garland, H. 1948. ASPEN FOR VENEER. U.S. For. Serv. Lake St. Aspen Rep. No. 13, 10 pp. 14 refs.

Miller, D. G. 1952. A PRELIMINARY INVESTIGATION OF VENEER CUTTING PROPERTIES OF ASPEN POPLAR. Mimeo. For. Prod. Lab., Can. No. O-167, 9 pp.

In tests on a small shipment of logs of *P. tremuloides*, optimum lathe settings (knife angle 90° 30' and 90° 0', horizontal opening of pressure bar 0.058 and 0.115 in. and horizontal opening 0.016 and 0.032 in. for 1/16-in. and 1/8-in. respectively) were determined. In tests on eight representative bolts, yields of 70% of the log volume were obtained, 49% grade 1, 21% grade 2, and 30% grade 3. The veneers dried and glued satisfactorily.

1953. VENEER CUTTING PROPERTIES OF CANADIAN ASPEN: A PRELIMINARY INVESTIGATION. Wood 18(7; 8): 253-5; 299-301.

Toole, A. W. 1947. ASPEN FOR CORE STOCK. U. S. For. Serv. Lake St. Aspen Rep. No. 11, 9 pp.

833 TIMBER IN BUILDINGS AND ENGINEERING STRUCTURES (MANUFACTURE AND USE)

Rees, L. W. 1947. ASPEN [POPULUS TREMULOIDES] LUMBER FOR BUILDING PURPOSES. U. S. For. Serv. Lake St. Aspen Rep. No. 9, 11 pp. 13 refs.

Sump, A. W. 1947. ASPEN FOR CABIN LOGS. U.S. For. Serv. Lake St. Aspen Rep. No. 15, 12 pp. Bblg.

834.9

Heebink, T. B. 1962. PERFORMANCE OF PALLETS FROM LOW-QUALITY ASPEN. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. 2264, 7 pp. 7 refs.

Describes tests, in which aspen pallets were revolved in drums and dropped on their corners, the results of which were compared with those for pallets of other hardwoods. Toughness values are given for aspen in green and dry condition.

835 INDUSTRIAL AND DOMESTIC WOODWARE (MANUFACTURE AND USE)

Panshin, A. J. 1950. DIMENSION STOCK AND OTHER USES OF ASPEN [POPULUS TREMULOIDES]. U.S. For. Serv. Lake St. Aspen Rep. No. 12, 18 pp. 13 refs.

839.1

Garland, H. 1949. ASPEN FOR EXCELSIOR. U. S. For. Serv. Lake St. Aspen Rep. No. 16, 10 pp. 14 refs.
Includes a brief history of the wood-wool industry, and discusses the suitability of *Populus tremuloides* for this purpose.

841.1

Kaufert, F. H. 1948. THE PRESERVATIVE TREATMENT OF ASPEN. U. S. For. Serv. Lake St. Aspen Rep. No. 19, 19 pp. 8 refs.

841.3

Trenk, F. B. 1955. INDICATIONS OF SERVICEABILITY OF FENCE POSTS TREATED WITH WATER GAS TAR BY HOT AND COLD BATH PROCESS—SPOONER BRANCH EXPERIMENT STATION. For. Res. Note Wis. Coll. Agric. No. 24, 2 pp.

Reports a small-scale experiment with aspen, jack pine, and white cedar (*Thuja occidentalis*). A treating schedule is given. Absorption was good in all species, and after 8 years in service, 11 out of 13 aspen, and all the jack pine and white cedar posts were sound while all controls had rotted off.

847 DRYING (SEASONING)

Smith, H. S. 1947. SEASONING OF ASPEN [POPULUS TREMULOIDES]. U. S. For. Serv. Lake St. Aspen Rep. No. 5, 19 pp. 16 refs.

852.15

Hossfeld, R. L., Oberg, J. C., and French, D. W. 1957. THE APPEARANCE AND DECAY RESISTANCE OF DISCOLOURED ASPEN. For. Prod. J. 7(10): 378-82. 3 refs.
Observations in fence-post trials and soil-block decay tests indicate that discolored woods associated with knots, Nectria canker, and "wetwood" were more resistant to decay than ordinary sapwood. Alcohol extracts from fluorescent wood were more toxic towards test fungi than those from nonfluorescent wood.

Oberg, J. C., Hossfeld, R. L., and Kaufert, F. H. 1956. FLUORESCENT MATERIALS ASSOCIATED WITH DISCOLORATION IN ASPEN. Tap. pi 39(7): 470-1. 6 refs.

Extractives from discolored zones in the wood of *Populus tremuloides* have been shown by paper partition chromatography to include a well defined group of strongly fluorescent compounds. Their nature and composition appear to be independent of the nature of the associated types of injury (e.g. by *Saperda calcarata*).

852.16

Clermont, L. P., and Bender, F. 1958. THE CHEMICAL COMPOSITION AND PULPING CHARACTERISTICS OF NORMAL AND TENSION WOOD OF ASPEN POPLAR AND WHITE ELM. Pulp Paper Mag. Can. 59(7): 139-43. 7 refs.

Terrell, B. Z. 1953. DISTRIBUTION OF TENSION WOOD AND ITS RELATION TO LONGITUDINAL SHRINKAGE IN ASPEN. Mater. Veg. 1(3): 288-99. 6 refs. [E.f.]

852.35

Kemp, A. K. 1957. STUDY OF FACTORS ASSOCIATED WITH THE DEVELOPMENT OF COLLAPSE DURING KILN DRYING OF ASPEN LUMBER. Abstr. of thesis, in Dissert. Abstr. 17(9): 1858-9. [Univ. Minn.] Factors studied were temperature, humidity, sp. gr., water and air volume, rate of drying, and behavior of heartwood, sapwood, and wetwood.

1959. FACTORS ASSOCIATED WITH THE DEVELOPMENT OF COLLAPSE IN ASPEN DURING KILN DRYING. For. Prod. J. 9(3): 124-30. 24 refs.

854 "GRADING" OF CONVERTED TIMBER

Anonymous. 1947. OFFICIAL GRADING RULES FOR NORTHERN WHITE PINE (PINUS STROBUS), NORWAY PINE (PINUS RESINOSA), EASTERN SPRUCE (PICEA GLAUCA AND P. MARIANA), JACK PINE (PINUS BANKSIANA), BALSAM (ABIES BALSAMEA), ASPEN (POPULUS TREMULOIDES). Northern Hemlock and Hwd. Mfrs. Ass., Oshkosh, Wis. 55 pp.

Conforming to American lumber standards.

1949. STANDARD GRADING RULES FOR NORTHERN WHITE PINE, NORWAY PINE, JACK PINE, EASTERN SPRUCE, WESTERN WHITE SPRUCE, BALSAM, TAMARACK, ASPEN LUMBER. Northern Pine Mfrs. Ass., Minneapolis, Minn. 36 pp.

Zasada, Z. A. 1948. ASPEN [POPULUS TREMULOIDES] LUMBER GRADES AND CHARACTERISTICS. U. S. For. Serv. Lake St. Aspen Rep. No. 6, 9 pp.

861 PULP AND PAPER MANUFACTURE. TEXTILE AND OTHER CELLULOSE DERIVATIVES

Brown, K. J., and McGovern, J. N. 1950. PRODUCTION OF HIGH-YIELD PULPS FROM ASPEN (POPULUS TREMULOIDES) BY MILD TREATMENTS WITH SODIUM HYDROXIDE. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. R1774, 6 pp. 3 refs.

Nihlen, H., and McGovern, J. N. 1943. SUITABILITY OF BIRCH, ASPEN AND SUGARBERRY FOR RAYON PULP: RESULTS OF CERTAIN SULFITE PULPING AND BLEACHING EXPERIMENTS. Mimeo. U.S. For. Serv. For. Prod. Lab., Madison No. R1441, 11 pp. Bblg.

Schafer, E. R. 1947. ASPEN FOR PULP AND PAPER. U.S. For. Serv. Lake St. Aspen Rep. No. 14, 10 pp. Bblg.

1947. ASPEN FOR PULP AND PAPER. Pulp Paper Mag. Can. 48(13): 104, 106, 108-9. Bblg.

— — — and Hyttinen, A. 1950. THE GROUNDWOOD PULPING OF MIXTURES OF WHITE SPRUCE AND QUAKING ASPEN. Tappi 33(7): 335-7.

As the amount of aspen in the mixture increased, the motor load remained constant but the grinding rate increased, energy consumption decreased, freeness increased, and strength decreased, the relationships being nearly linear.

861.0

Atwell, E. A. 1956. DECAY AND DISCOLOURATIONS IN POPLAR PULPWOOD. F.P.L. Tech. Note For. Prod. Lab. Can. No. 1, 24 pp. 10 refs.

Buijtenen, J. P. van, Joranson, P. N., and Einspahr, D. W. 1958. DIPLOID VERSUS TRIPLOID ASPEN AS PULPWOOD SOURCES WITH REFERENCE TO GROWTH, CHEMICAL, PHYSICAL AND PULPING DIFFERENCES. Tappi 41(4):170-5. 6 refs.

Hyttinen, A., Martin, J. S., and Keller, E. L. 1960. PULPING AND PAPERMAKING EXPERIMENTS ON QUAKING ASPEN FROM COLORADO. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. 2180, 5 pp.

Describes and discusses groundwood, sulphite, sulphate, and semi-mechanical pulping experiments made at Madison. Magazine coating-base papers made from the pulps showed that the sulphite pulp was stronger than that made from Lake States aspen, while the other pulps were almost as strong as the corresponding pulps made from Lake States aspen.

McGovern, J. N. 1946. USE OF BLEACHED ASPEN SEMICHEMICAL PULP IN GROUNDWOOD BOOK PAPER. Paper Tr. J. 123(20): 47-52. Bblg.

— and Mackin, G. E. 1950. FARM WOODLOT ASPEN FOR CREPED TISSUE PAPER. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. R1783, 6 pp.

Mackin, G. E. 1948. BOOK PAPER FROM ASPEN SEMICHEMICAL AND GROUNDWOOD PULP. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. R1709, 3 pp. 2 refs.

861 x 13

Brown, K. J., and McGovern, J. N. 1950. PRODUCTION OF HIGH-YIELD PULPS FROM ASPEN BY MILD TREATMENTS WITH SODIUM HYDROXIDE. Tappi 33(8): 364-8. 3 refs.

861 X 16

Montano, J., and Hossfeld, R. 1951. THE REACTION OF WOOD WITH ALKALINE SOLUTIONS OF SODIUM HYDROSULPHITE. Tappi 34(10):468-70. 20 refs.

861.1

McGovern, J. N., and others. 1949. EXPERIMENTS ON WATER AND STEAM COOKING OF ASPEN. Tappi 32(10):440-8. 12 refs.

March, R. E. 1948. THE EFFECT ON PULP QUALITY OF THE STEP-WISE REMOVAL AND REPLACEMENT OF THE HEMICELLULOSES FROM ASPEN HOLOCELLULOSE. Paper Tr. J. 127(17): 51-7.

861.11

Atack, D., and May, W.D. 1962. MECHANICAL PULPING STUDIES WITH A MODEL STEEL WHEEL. Pulp Paper Mag. Can. 63(1):T10-T20. 12 refs.

A study using a specially designed apparatus, of the frictional resistance to sliding of rigid cylinders over *Picea mariana*, *Abies balsamea*, and *Populus tremuloides* wood in the presence of water and through a range of specific loading conditions embracing those employed in commercial grinding.

Hyttinen, A., Mackin, G. E., and Schafer, E. R. 1947. EXPERIMENTS ON THE GRINDING OF QUAKING ASPEN AND USE OF PULP IN PRINTING PAPER. Paper Tr. J. 125(13): 53-62. Bblg.

— and Schafer, E.R. 1948. EFFECT OF DECAY ON THE GROUNDWOOD PULPING OF QUAKING ASPEN. Paper Indus. Paper World, June. 3 pp. 3 refs.

Schafer, E. R., and Hyttinen, A. 1950. EFFECT OF THE MOISTURE CONTENT OF WOOD ON THE GROUNDWOOD PULPING OF WHITE SPRUCE AND QUAKING ASPEN. Paper Tr. J. 131(5): 26-9.

861.12

Diehm, R. A., Larson, H. L., and Meinstein, S. 1960. THE USE OF SURFACTANT IN THE COLD CAUSTIC PULPING OF ASPENWOOD. Tappi 43(4): 364-9. 2 refs.

Studies the effects on pulp yield, quality, and production costs of adding various wetting agents to *Populus tremuloides* chips to enhance the penetration of cold soda liquor into hardwood. Naxylene sulphonate appeared the most suitable of the surfactants examined.

Dorland, R. M., Leask, R. A., and McKinney, J. W. 1954. NEUTRAL SULPHITE COOKING OF HARDWOODS. Pulp Paper Mag. Can. 55(3): 258-62. 9 refs.

Discusses the results of pulping aspen and mixed hardwoods by the neutral sulphite semichemical method.

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Faber, H. B., Jr. 1960. THE METHANOL-EXTRACTABLE AROMATIC MATERIALS IN THE INNER BARK OF [POPULUS] TREMULOIDES. *Tappi* 43(5): 406-13. 40 refs.

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Pearl, I. A., and Darling, S. F. 1959. STUDIES ON THE BARKS OF THE FAMILY SALICACEAE. I. TREMULOIDIN, A NEW GLUCOSIDE FROM THE BARK OF POPULUS TREMULOIDES. *J. Organ. Chem.* 24(6): 731-5. 21 refs.

— and Darling, S. F. 1959. STUDIES ON THE BARKS OF THE FAMILY SALICACEAE. II. SALIREPOSIDE FROM THE BARK OF POPULUS TREMULOIDES. *J. Organ. Chem.* 24(10): 1616. 7 refs. The glucoside, reported originally to be populin, from the bark proved on reexamination to be salireposide, not found before in *Populus* spp. Substantial amounts of salicin and tremuloidin were also found. Populin is present in the bark of *P. tremula* and *P. alba*.

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Data from individual trees indicated statistically significant differences in fibre length and sp. gr. between clones of the two species studied. Variation was also apparent in the fibre arrangement in the phloem. The material was from trees 5 years of age or younger. Studies should be made on more mature trees to determine whether these juvenile traits are permanent or temporary.

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Pauley, S. S. 1954. VARIATION IN TIME OF BREAK OF DORMANCY AMONG ALTITUDINAL ACOTYPES OF *POPULUS TRICHOCARPA*. Abstr. in Genetics, Madison 39: 986-7.

Whereas short-growing-season ecotypes from high latitudes are characterized by precocity, short-growing-season ecotypes from high altitudes, when grown under uniform temperature and day-length conditions, proved significantly less precocious than low

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[New Zealand: Soil Conserv. Rivers Control Coun.] 1959. POPLAR INVESTIGATIONS. Extr. from Report, Soil Conserv. and Rivers Control Council, Wellington 1958/1959: 26-S.

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Bier, J. E. 1959. THE RELATION OF BARK MOISTURE TO THE DEVELOPMENT OF CANKER DISEASES CAUSED BY NATIVE FACULTATIVE

PARASITES. II. *FUSARIUM* CANKER ON BLACK COTTONWOOD. Canad. J. Bot. 37: 781-8.

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Heilgendorff. 1931. GAME DAMAGE TO *TRICHOCARPA*. Mitt. Dtsch. Dendrol. Ges. 43: 353

5 FOREST MENSURATION

542 BY ECOLOGICAL METHODS

Smith, J. H. G. 1957. SOME FACTORS INDICATIVE OF SITE QUALITY FOR BLACK COTTONWOOD (*POPULUS TRICHOCARPA* TORR. AND

GRAY) J. For. 55(8): 578-80. 4 refs.

Climatic influence, topography and soil requirements are discussed in relation to growth of *P. trichocarpa* in British Columbia, and vegetation indicative of site classes, I, II, and III is listed.

8 FOREST PRODUCTS AND THEIR UTILIZATION

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Brown, C. L., and Sax, K. 1962. THE INFLUENCE OF PRESSURE ON THE DIFFERENTIATION OF SECONDARY TISSUES Amer. J. Bot. 49(7): 683-91. 8 refs.

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Kennedy, R. W. 1957. FIBRE LENGTH OF FAST- AND SLOW-GROWN BLACK COTTONWOOD [*POPULUS TRICHOCARPA*]. For. Chron. 33 (1): 46-50. 11 refs.

The lengths of fibres from fast- and slow-grown trees were measured at comparable height and ages. Fibre length was found to vary directly and significantly with both growth rate and age from pith. An additional investigation showed that fast-grown stool-shoots had longer fibres than slow-grown ones from the same stump. The mechanisms regulating fibre length in trees are discussed briefly. [From author's summary.]

812 PHYSICAL AND MECHANICAL PROPERTIES

[U.S.A.: U. S. For. Prod. Lab.] 1950. VENEER CUTTING AND DRYING PROPERTIES. COTTONWOOD. Rep. U. S. For. Serv. For. Prod. Lab., Madison No. D1766-3, 4 pp. 4 refs.

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815 EFFECT OF GROWTH FACTORS ON STRUCTURE AND PROPERTIES

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A partially annotated list developed from citations furnished by the Commonwealth Forestry Bureau and arranged according to The Oxford System of Decimal Classification for Forestry.