Journal of Forestry, 2021, 432–435
doi:10.1093/jofore/fvab012
Picture the Past
Received January 26, 2021; Accepted January 28, 2021

Picture the Past

The First Silvicultural Study of the Southern Forest Experiment Station

Don C. Bragg[1]

Don C. Bragg (Don.C.Bragg@usda.gov) USDA Forest Service, Southern Research Station, Monticello, AR

Photograph 1 [22423A]: When the USDA Forest Service's Southern Forest Experiment Station began operating on July 1, 1921, the Station had its inaugural silvicultural research project already in the woods. In 1915, Samuel Trask Dana, C.R. Tillotson, and some others from the agency's Washington office collaborated with Henry Hardtner and Urania Lumber Company to establish a series of plots on the Company's lands in LaSalle and Winn parishes in central Louisiana (Wakeley and Barnett 2011). The plots were in young (10 to 20 years old), even-aged, old-field stands of loblolly (*Pinus taeda*) and shortleaf (*Pinus echinata*) pines, a common forest condition across much of the southern US. These typically overstocked and often burned pine stands represented an opportunity for future timber production, although silvicultural options for them were virtually unknown. Hence, Dana, Hardtner, and colleagues sought to investigate the response of these old-field stands using thinning practices developed in Europe but adapted for American forests. This January 1915 photograph by Dana shows one of the quarter-acre plots established in Winn Parish, Louisiana, with all trees numbered for study tracking purposes.

Photograph 2 [22421A]: Some of the 25 permanent plots were reserved as unharvested controls ("checks"), whereas the remainder received a thinning treatment (Wyman 1922, Bull 1936). These treatments were classified as either "German thinning" (also known as low thinning, ordinary thinning, or thinning from below) where suppressed trees are removed first, or "French thinning" (also called high thinning, crown

thinning, or thinning from above), where suppressed trees not expected to survive until the next entry and codominant trees next to crop trees were cut (Hawley 1929). Depending on how intensely (originally called "grades" ranging from A [light] to D [very heavy]) these removals were applied, the thinned stands could look very similar or quite different. In this picture, also taken by Dana in January 1915, the old-field plot of shortleaf and loblolly pines received a light (Grade A) German thinning. Note that the felled pines are clearly smaller than the crop trees. Furthermore, although these cut pines were delimbed (possibly for the picture or perhaps to reduce the risk of fire), this wood was not being commercially used, as there was then little market for small-diameter southern pine. Pine-based paper production in the South was inconsequential prior to 1919, and the Louisiana area did not have a kraft paper mill until about 1920 (Fulling 1956, Barnett and Carter 2017).

Photograph 3 [185385]: Heavier thinnings in even-aged, old-field southern pine stands were also done, although conventional wisdom favored light thinnings (Maunder and Fry 1966). This picture, taken in April 1924 (likely by W.R. Hine), shows a heavily thinned loblolly pine stand in LaSalle Parish, Louisiana. In addition to the more open condition, this image shows two other notable departures from the previous picture. First, the boles of the thinned trees have been commercially used; by this time, a large kraft papermill was operating in southern Louisiana. Second, the tall stumps in this image are remnants of the virgin longleaf pine (*Pinus palustris*) forests that covered parts of this area. These stumps not only suggest a different land use history for this

parcel—it does not appear that this land was row cropped after lumbering—but also hint at the nature of research of this period. Before about 1930, few forestry field studies were robustly replicated to control for factors such as differences in stand history, site conditions, species composition, stand age, etc. Later efforts to increase experimental control, avoid biased observations, conduct proper sampling techniques, and robustly analyze data using appropriate statistical techniques (e.g., Gevorkiantz 1935) would almost certainly have resulted in a much different study of these stands.

Photograph 4 [232352]: Study weaknesses notwithstanding, the Urania old-field thinning work produced some useful results during its decades-long run. In this picture, taken in December 1928 by L.I. Barrett, the 3.1 cords of pulpwood, cut from a single quarter-acre plot in an example of a heavy French thinning, not only documented the initial high yield of thinning such overstocked old-field stands, but it presaged the primary goal of this project (accelerating the growth of small pines into more valuable sawtimber size classes). The Southern Forest Experiment Station researchers then responsible for this study emphasized that "...the ultimate objective of management in southern pines should be the production of sawtimber, not cordwood." (Barrett and Righter 1929, p. 782). To this end, these studies supported the growing realization that although light thinnings from below in overstocked stands of even-aged southern pines captured usable materials before they died and decayed, they only marginally improved growth performance on larger residual trees (Barrett and Righter 1929, Bull 1935, 1936). Mann (1952) would later interpret some of these data much differently when pulpwood production became much more important to southern landowners.

Photograph 5 [352111]: The first silvicultural field experiment of the Southern Forest Experiment Station provided not only a useful (if limited) set of research outcomes, but it helped to demonstrate the value of visual examples of the thinning treatments and their (un)intended consequences. This August 1937 photograph by C.A. Bickford and T.T. Kohara of a heavily thinned plot with a dense hardwood understory in LaSalle Parish highlighted the challenge of opening pine canopies to improve growth performance. Although this heavy thinning significantly increased pine crop tree growth, the treatment—especially on better quality sites—also released resources to hardwood competitors that often dominated the understory of the site. Not only was this a problem for natural pine regeneration, but later research documented how these hardwoods decreased mature pine growth, especially in dry years. Eventually, prescribed fire would return as a tool to southern pine managers to improve

natural regeneration success and control hardwoods, only to be replaced later by planting and herbicides.

Endnote

1. All photographs are public domain images available for download from the Southern Research Station's Centennial Collection at the USDA Forest Service's Research Data Archive (https://www.fs.usda.gov/rds/archive/catalog/RDS-2020-0047; https://doi.org/10.2737/RDS-2020-0047). This article was written by a US government employee on official time and is therefore in the public domain.

Literature Cited

Barnett J.P., and M.C. Carter. 2017. *The dawn of sustainable forestry in the South*. USDA Forest Service General Technical Report SRS-221. 39 p.

Barrett L.I., and F.I. Righter. 1929. Working plan for experimental thinnings in shortleaf and loblolly pines. *J. For.* 27(7):782–803.

Bull H. 1935. Thinning loblolly pine in even-aged stands. *J. For.* 33(5):513–518.

Bull H. 1936. *Pulpwood yields from experimental thinnings in old-field stands of loblolly and shortleaf pines*. USDA Forest Service Southern Forest Experiment Station Occasional Paper 57. 9 p.

Fulling E.H. 1956. Botanical aspects of the paper-pulp and tanning industries in the United States—an economic and historical survey. *Am. J. Bot.* 43(8):621–634.

Gevorkiantz S.R. 1935. The statistical method in forest research. *J. For.* 33(12):974–978.

Hawley R.C. 1929. P. 335 in *The practice of silviculture*. 2nd ed. John Wiley & Sons, Inc., New York, NY.

Mann Jr., W.F. 1952. Response of loblolly pine to thinning. *J. For.* 50(6):443–446.

Maunder E.R., and A. Fry. 1966. Samuel Trask Dana: The early years. *For Conserv. His.* 10(2):2–13.

Wakeley P.C., and J.P. Barnett. 2011. *Early forestry research in the South: A personal history*. USDA Forest Service General Technical Report SRS-137. 90 p.

Wyman, L. 1922. Results from sample plots in southern pines experiments. *J. For.* 20(7):780–787.