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HARDWOOD FENCE POSTS GIVE GOOD SERVICE

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Very few tree species make naturally durable fence posts. Osage-orange, mulberry, black locust, cypress, and some species of cedar are known for the good service they give. But in no case are their names a guarantee. Only the heartwood of these species possesses adequate durability.

Unless treated with chemical preservatives most posts will last only 2 to 7 years, while many species if properly treated give average service of 20 to 40 or more years.

With the increase of fencing and the decrease of the supply of naturally durable species, most farmers have turned to treated fence posts. On many large farms, managers do their own treating.[2]

To help farmers decide which hardwood species will make desirable fence posts, the Southern Forest Experiment Station in cooperation with the Mississippi Agricultural Experiment Station has been conducting service tests since 1937. The test posts have been part of the general fencing of the Delta Experimental Forest near Stoneville.

Installations were made in 1937, 1941, and 1947 and measured for the last time in 1959. Thus the test periods were 23, 19, and 13 years.

All posts were inspected annually. All were set in Sharkey clay, a fine-textured soil with poor internal drainage.

1937 Installations

The first test was established in February 1937 (see Table 1). It included 573 posts representing 10 species; 480 were untreated, as the objective was to test posts made from the so-called naturally durable hardwoods. For comparison, 93 posts that had been pressure-treated with creosote were installed at the same time.

Of the untreated posts, cypress, overcup oak, and honeylocust were from sapwood of second-growth trees. Posts of the other species were mostly heartwood. Each species of the untreated posts was represented by both split and round posts.

The untreated sapwood posts of cypress, honeylocust, and overcup oak had low average lives that ranged from 4.2 to 5.8 years, enough for temporary fencing only.

Of 56 round Osage-orange posts, none had failed after 23 years, and of 24 split Osage-orange posts, only one had failed.

All of the treated posts were round. Each of the four species had been treated in two lots—one lot to average absorption of 6 pounds of creosote per cubic foot and the other lot to 12 pounds per cubic foot. The posts with 12-pound absorption outperformed those of the same species with 6-pound absorption.

1941 Installations

The 1941 test had 331 posts representing 14 hardwood species or species groups. The posts were treated with coal-tar creosote in hot and cold baths. Lots representing most species were mixtures of heartwood and sapwood and split and round posts.

Ash, sap cypress, American elm, honeylocust, mixed oaks, overcup oak, bitter pecan, and sweetgum proved highly serviceable. After 19 years, at least 85 percent of the posts of these species were still in the fenceline. Cottonwood, red maple, and hackberry ranged from 63 to 68 percent in serviceability. Willow had the shortest life of all the treated posts, with only 15 percent of the posts still useful at the end of the test.

1947 Installations

In 1947, 226 hardwood posts representing 11 species were placed in service. Two hundred were given a hot-and-cold bath treatment with 5-percent pentachlorophenol, and 26 were steeped in chromated zinc chloride.

Bitter pecan, honeylocust, water oak, and overcup oak were represented by both heartwood and sapwood posts. The sapwood posts absorbed more preservative and gave longer service than the heartwood posts. The differences were

[1]The authors are stationed at the Stoneville Research Center, Stoneville, Mississippi. The Stoneville Center is maintained by the Southern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, in cooperation with the Mississippi Agricultural Experiment Station and the Southern Hardwood Forest Research Group.

[2]For details on methods of treating posts, see Bulletin 483 of the Mississippi Agricultural Experiment Station, "Fences for Bottomland Farms in the Delta," by L. C. Maisenhelder and J. S. McKnight, and Farmers' Bulletin 2049 of the U. S. Department of Agriculture, "Preservative Treatment of Fence Posts and Farm Timbers," by J. Oscar Blew, Jr. and Francis J. Champion.

(Over)

largest in overcup and water oak.

Chromated zinc chloride, a leachable water-borne preservative, did not offer good protection in contact with water and wet soil.

All of the cottonwoods steeped in this chemical failed inside of 13 years; their average life was 6.8 years. Willow posts had an average life of 10 years—8 percent were still serviceable after 13 years.

Conclusions

What do the results of these tests mean to a user of fence posts? First, care should be exercised in using untreated posts of any species. Heartwood posts of Osage-orange, mulberry, and black locust give excellent service untreated. Heart cypress can be added to this list even though it was not included in the tests. Heartwood of most other species and sapwood of all species should be treated before it is put into permanent fences.

Commercially pressure-treated posts of most species should give excellent service when adequate absorption is obtained. Cottonwood, sweetgum, and loblolly and shortleaf pine that had absorbed 12 pounds of coal-tar creosote per cubic foot showed extreme durability after 23 years.

The hot-and-cold-bath method of treating fence posts has proven very satisfactory. This method is one that a farmer or landowner can employ, for the facilities are simple and he can use his own labor. With creosote or pentachlorophenol this method gave good to excellent results for the 14 species tried except for willow, which gave poor service. Overcup oak and sweetgum gave good results when creosote was used but rather poor results with pentachlorophenol. As a rule, sapwood posts give longer service than heartwood posts of the same species when treated by this method. Therefore, most hardwood species with large portions of sapwood should make excellent fence posts when treated properly by the hot-and-cold-bath method.

Table 1.—Serviceability, round and split posts combined

Treatment	Year installed and years posts have been in test	Species[1]	Preservative absorved	Proportion serviceable at end of test	Estimated service life[2]
			Pounds per cubic foot	Percent	Years
Untreated	1937	Osage-orange (heart)	-----	99	—
	23	Mulberry (heart)	-----	18	20
		Black locust (heart)	-----	9	18
		Overcup oak (sap)	-----	0	5
		Cypress (sap)	-----	0	6
		Honeylocust (sap)	-----	0	5
		Cottonwood (sap)	12	100	—
Coal-tar creosote, under pressure	1937	Loblolly pine (sap)	12	100	—
		Shortleaf pine (sap)	12	92	—
	23	Sweetgum (sap)	12	89	—
		Shortleaf pine (sap)	6	83	33
		Sweetgum (sap)	6	42	23
		Loblolly pine (sap)	6	33	22
		Cottonwood (sap)	6	8	18
Coal-tar creosote, hot-cold bath	1941	Cypress (sap)	7	100	—
		American elm	11	100	—
	19	Bitter pecan	6-9	98	—
		Green ash	9-12	96	—
		Overcup oak	6-10	96	—
		Honeylocust	7-10	91	—
		Sweetgum	11	89	—
		Mixed oaks	8	88	—
		Water oak	8-10	83	27
		Persimmon	8	82	26
		Hackberry	8-13	68	23
		Cottonwood	7-9	64	22
		Red maple	8	63	22
		Black willow	8	15	16
Pentachlorophenol, hot-cold bath	1947	American elm (sap)	6	100	—
		Cedar elm (sap)	10	100	—
	13	Bitter pecan (sap)	7	100	—
		Honeylocust (sap)	8	100	—
		Water oak (sap)	6	100	—
		Waterlocust (heart)	8	93	—
		Bitter pecan (heart)	4	93	—
		Overcup oak (sap)	8	92	—
		Honeylocust (heart)	8	92	—
		Water oak (heart)	3	86	—
		Hackberry (heart)	10-13	86	—
		Overcup oak (heart)	3	83	18
		Sweetgum (sap)	2-10	59	15
Chromated zinc chloride, steeped	1947	Black willow (sap)		8	10
	13	Cottonwood (sap)		0	7

[1] "Sap" means approximately 80 percent or more sapwood and "heart" means approximately 80 percent or more heartwood. Except where otherwise specified, tests include both sapwood posts and hardwood posts.

[2] Estimated service life is based on percent of posts that have failed, when 15 percent or more, and years the posts have been in service. No projection of expected average life in years is feasible when failures occur in less than 15 percent of the posts.