SO-239

Southern Forest Experiment Station

Research Note

1978

Size and Age of Tree Affect White Oak Stump Sprouting

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SUMMARY

Eighty overtopped white oaks were felled in winter of 1976-1977, and overtopping hardwoods were removed from 40 of the stumps. During the next growing season, 62 of the stumps produced a total of 1086 sprouts. The removal of the overtopping hardwoods had little effect on whether or not a stump sprouted or on numbers or height of the sprouts. Trees over 60 years of age or over 8 inches in d.b.h. produced few or no sprouts. The tallest sprout on each stump averaged 2.5 feet. Almost all sprouts grew from below the ground line on the stump.

Additional keyword: *Quercus alba.*

EARLY WHITE OAK STUMP SPROUTING

In the upland hardwood region, millions of white oak trees are overtopped by competing hardwoods. During forestry activities, these white oaks and the trees that overtop them are often felled, releasing the stumps from competition. Whether these stumps sprout or do not sprout greatly affects the early value of the land for wildlife and later for timber. Ivan Sander (1976) reported that stump sprouts are the most rapidly growing part of a new oak stand and that the number of sprouts can be projected by the size distribution of the trees being cut. In this experiment, we examined the effects of release, age, and size on early sprouting of white oak stumps.

METHODS

Eighty vigorous and well-formed white oak trees—overtopped for all or at least the last part of their lives—were selected for study. These trees were felled near the ground line with no notch in the stump. Forty of the stumps were then released by cutting one or more overtopping hardwoods. In August of the first growing season after cutting, each stump was checked for early sprouting. Data recorded included tree age, number of sprouts per stump, height of tallest sprout, and the location of the sprout on the stump.

RESULTS

Sixty-two of the eighty stumps produced sprouts. The number of sprouts ranged from 0 to 115 per stump and averaged about 13. The height of the tallest sprout on each stump ranged from a few inches to over 4 feet and averaged 2.5 feet. The release from overtopping trees had no apparent effect on either the number or height of stump sprouts (table 1). While it is likely that the released sprouts will perform better in the long run, the shaded sprouts could provide a quick source of browse for wildlife.

Of the 16 sample trees over 8 inches d.b.h., only 3 sprouted and only 1 had more than 10 sprouts (table 1). The trees smaller than 8 inches d.b.h. showed great variation in numbers

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Table 1.—*Number of white oak sprouts per released or unreleased stump in relation to size of tree.*

Tree Size	Released		Unreleased	
	Sample Trees	Sprouts	Sample Trees	Sprouts
Inches d.b.h.	No.	Avg. No.	No.	Avg. No.
1.6 — 1.9	3 (3)[1]	6	2 (2)[1]	14
2.0 — 3.9	9 (9)	12	7 (6)	14
4.0 — 5.9	12 (11)	16	11 (11)	15
6.0 — 7.9	9 (8)	22	11 (9)	21
8.0 +	7 (1)	1	9 (2)	2
Average Sprouts Per Stump		11		14

[1]Number in parentheses indicates stumps sprouting in that category.

of stump sprouts. The wide variation among smaller trees spoiled attempts to associate tree size and number of sprouts by regression analysis. Wendel (1975) found somewhat similar sprouting patterns for white oak stumps from even-aged trees that were free-to-grow. But he found that free-to-grow trees up to 17 inches dbh would produce stump sprouts. Thus, at smaller sizes than free-to-grow trees overtopped white oak apparently loses the ability to produce stump sprouts.

Regressions of age on sprouting pattern were very weak. The actual data, however, suggest that age is important (table 2). Maximum sprouting came from stumps of trees about age 40, with a gradual decline to age 60. Beyond age 60, only 1 of 10 trees produced stump sprouts, and it had only four.

Age or size of the mother tree apparently has little effect on the height growth of stump sprouts. Many of the sprouts from trees of different ages and sizes were over 3 feet tall.

The location of the sprouts on the stump is of particular importance because sprouts originating above the ground line are generally of poor form and short lived. In this experiment, 936 of 1086 sprouts originated below the ground line. On 2 stumps all sprouts originated above the ground, but on 38 stumps all sprouts originated below ground. Apparently, no way exists to predict which stumps will have sprouts originating above ground.

LITERATURE CITED

Sander, Ivan L., Paul S. Johnson, and Richard F. Watt.
1976. A guide for evaluating the adequacy of oak advance reproduction. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-23, 7 p. North Central For. Exp. Stn., St. Paul, Minn.

Wendel, G. W.
1975. Stump sprout growth and quality of several Appalachian hardwood species after clearcutting. U.S. Dep. Agric. For. Serv. Res. Pap. NE-329, 9 p. Northeast. For. Exp. Stn., Upper Darby, Pa.

Table 2.—*Number of white oak sprouts per released or unreleased stump in relation to age of tree.*

Age	Released		Unreleased	
	Sample Trees	Sprouts	Sample Trees	Sprouts
Years	No.	Avg. No.	No.	Avg. No.
30 — 39	12 (12)[1]	15	14 (13)[1]	15
40 — 49	13 (11)	14	14 (13)	10
50 — 59	11 (8)	12	6 (4)	31
60 +	4 (1)	1	6 (0)	0
Average Sprouts Per Stump		11		14

[1]Number in parentheses indicates stumps sprouting in that category.

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U.S. GOVERNMENT PRINTING OFFICE: 1978 773-231