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Sprouting of Slash, Loblolly, and Shortleaf Pines Following a Simulated Precommercial Thinning

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SUMMARY

To prevent cut stumps of 4- to 7-year-old slash (*Pinus elliottii* Engelm.) and loblolly (*P. taeda* L.) pines from resprouting, precommercial thinnings should be done in late summer at 6 inches or less above the groundline. For shortleaf pine (*P. echinata* Mill.), late summer and 6 inches or less appears safe but should be delayed at least until age 5 years.

INTRODUCTION

Natural or direct-seeded stands of southern pines are often overstocked and need precommercial thinning to prevent a serious reduction in growth of crop trees. But some species, notably shortleaf (*Pinus echinata* Mill.) and Virginia (*P. virginiana* Mill.), are prolific sprouters when cut above the groundline. Such a situation can easily negate a thinning operation. Numerous inquiries on the problem in the early 1970's prompted an investigation on how best to prevent resprouting following precommercial thinning. A study was initiated to determine the effects of age at cutting, season of cutting, and height of cutting on resprouting of three principle Midsouth species.

PROCEDURES

Slash (*P. elliottii* Engelm.), loblolly (*P. taeda* L.), and shortleaf pines were direct-seeded in rows to make the evaluation. Three replications were sown in successive years, beginning in March 1975, 1976, and 1977 for blocks 1, 2, and 3 respectively. Sowing within each replication was done in 5 successive years so that several age classes could be cut at the same time. Thus, the last sowing would be done on the third replication in March 1981. Plans were to cut at ages 2, 3, 4, 5, and 6 years from seed, to cut in September and February, and to cut all three species at 2 and 6 inches above the groundline plus cutting shortleaf at the groundline. The five age classes on block 1 would be cut in September 1980 and February 1981, on block 2 in September 1981 and February 1982, and on block 3 in September 1982 and February 1983. Statistical analysis would determine the effects of age, season, and height of cutting on sprouting, and any interactions that might occur. Species would be analyzed separately and not be compared.

Plans were rendered statistically invalid by an incendiary fire on December 25, 1980. All of the first replication and more than half the second replication were destroyed. However, because the remaining portion of the study could produce some general information that might be useful, all of block 3 and the remaining portion of block 2 were cut to specifications in September 1982 and February 1983. The trees available for cutting in block 2 were 1 year older than the planned cutting age. This note reports the results.

RESULTS AND DISCUSSION

Slash Pine

Precommercially thinning 4- to 7-year-old slash pine in September and cutting it up to 6 inches in height did not result in any substantial amounts of sprouting (table 1).

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Table 1.—*Living sprouts on slash pine at five observations following a simulated precommercial thinning by age, season, and height of cutting*

Age from seed	Date of cutting	Height of cutting	Sprouting observed on				
			2/16/83	4/16/83	6/14/83	2/1/84	6/13/85
years	*mo/yr*	*inches*	*percent*				
4	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	30	23	15	15
		6	.....	58	56	14	14
5	9/82	2	2	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	10	8	0	0
		6	.....	24	18	4	4
6	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	3	3	0	0
		6	.....	11	3	0	0
7	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	0	0	0	0
		6	.....	0	0	0	0

However, sprouting is likely to occur from cutting in February under the age of 6 years, and a substantial proportion of the sprouts can be expected to survive.

Mann and Lohrey[1] recommend thinning at about age 3 years when trees are large enough to be easily seen but small enough to be cut with light machinery. The results of this study indicate that such an early thinning should be made before the beginning of fall dormancy. Though cutting at age 3 was not possible here, the data suggest that the younger the slash pine, the more susceptible to sprouting when cut in the dormant season. Cutting at age 4 in February at 2 and 6 inches resulted in 30 and 58 percent sprouting, respectively, within 8 weeks after cutting. Half the sprouts from 2 inches and a third from 6 inches were still alive and healthy 2 years later.

Loblolly Pine

This species responded much the same as did slash pine—no sprouting from a September cut and a trend to decrease sprouting as age increased for a February cut (table 2). The most surprising occurrence with loblolly, however, was the difference in sprouting response between 2- and 6-inch cuts in February at ages 6 and 7. At 2 inches, there was minimal sproutng at age 6 with none surviving, and no sprouting at age 7. But about one-third of the 6-inch cuts sprouted in both years, and half the sprouts survived.

Shortleaf Pine

Precommercially thinning 4-year-old shortleaf should be done late in the active growing season, and it should be cut as close to the ground as possible (table 3). Even then, 48 percent in this study sprouted, but none survived. All the 4-year-olds cut at 2 and 6 inches sprouted, with 40 and 60 percent surviving. For 5- and 6-year-olds, it appears that a precommercial thinning should also be done late in the growing season, but cut at a height of 6 inches. Although sprouting was prolific, none survived longer than 7 months.

SUMMARY

Results garnered from the remnants of this study were not surprising, with the possible exception of the sprouting response in 4-year-old slash pine. It was generally believed that slash sprouting was not a problem. Loblolly was known to sprout to some degree but was not thought to be troublesome. Though there was some sprouting from February cutting at all ages, the only ones surviving 2 years were from 6-inch cuts. Precommercially thinning shortleaf late in the active growing season at age 5 or 6 years and cutting at 6 inches in height presents the best possibility for success.

[1]Mann, W. F., Jr; and Lohrey, R. E. Precommercial thinning of southern pines. J. For. 72 (9): 557–560; 1974.

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Table 2.—*Living sprouts on loblolly pine at five observations following a simulated precommercial thinning by age, season, and height of cutting*

Age from seed	Date of cutting	Height of cutting	Sprouting observed on				
			2/16/83	4/16/83	6/14/83	2/1/84	6/13/85
years	*mo/yr*	*inches*	*percent*				
4	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	54	17	0	0
		6	.....	55	32	23	20
5	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	29	25	0	0
		6	.....	22	12	2	2
6	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	7	7	0	0
		6	.....	29	24	14	14
7	9/82	2	0	0	0	0	0
		6	0	0	0	0	0
	2/83	2	.....	0	0	0	0
		6	.....	35	29	18	18

Table 3.—*Living sprouts on shortleaf pine at five observations following a simulated precommercial thinning by age, season, and height of cutting*

Age from seed	Date of cutting	Height of cutting	Sprouting observed on				
			2/16/83	4/16/83	6/14/83	2/1/84	6/13/85
years	*mo/yr*	*inches*	*percent*				
4	9/82	0	48	30	0	0	0
		2	100	40	40	40	40
		6	100	60	60	60	60
	2/83	0	.....	78	70	61	61
		2	.....	100	95	95	95
		6	.....	100	100	92	92
5	9/82	0	54	8	8	4	0
		2	90	25	5	5	5
		6	87	8	0	0	0
	2/83	0	.....	72	96	76	76
		2	.....	96	96	64	64
		6	.....	100	100	84	84
6	9/82	0	46	15	15	15	8
		2	64	7	0	0	0
		6	85	0	0	0	0
	2/83	0	.....	55	55	64	64
		2	.....	69	69	46	46
		6	.....	100	100	69	69