Chemical Control of Small-Diameter Scrub Oak

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The Problem

In the deep sands of the Carolina-Georgia Sand Hills, planting pine successfully requires the control of competing vegetation during the early life of a plantation. One of the most intensive techniques for pre-planting site preparation on scrub oak land is used by the S. C. State Commission of Forestry in its State Forests. Briefly, it consists of machine clearing the scrub oak and deep plowing, followed by a "laying out" period for soil stabilization before planting pine (Fig. 1). During the first year minor but increasing competition results from sprouts arising from residual root-stocks. Consequently, by the third year the competition may seriously retard further development of planted pine. Less intensive site preparation, such as plowing single furrows (Fig. 2), may result in even more serious competition at this time. Thus, economical and defective measures for controlling the scrub oak sprouts at this stage are needed. Certain chemical control methods recently tested in the Sandhills show real promise.

FIGURE 1.—*Final disking to prepare for tree planting on the Manchester State Forest, S. C.*

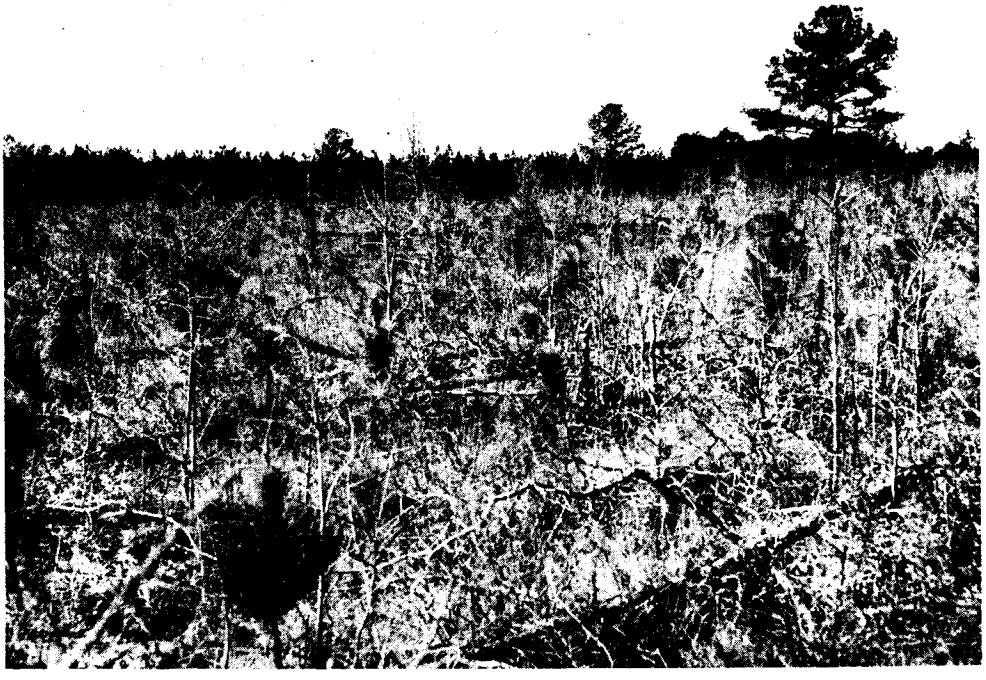


FIGURE 2.—*This area was planted to slash pine in shallow furrows made by a Mathis plow. Scrub oaks between the furrows were frilled and treated with a 2,4,5-T at the time of planting. Three years later, as pictured above, scrub oak competition is serious, and will require further treatment.*

Study Described

In 1953, the Santee Research Center of the Southeastern Forest Experiment Station, working with the South Carolina State Commission of Forestry, compared Ammate and 2,4,5-T in a test involving both time and method of treating the scrub oak. Forty turkey oaks (*Quercus laevis*), equally divided among four treatments (Table 1 and Figure 3), were poisoned each month for one year. All were single stems, ranging from ½ to four inches in diameter at breast height and growing on the deep sandy soil of the Sand Hills State Forest near Cheraw, S. C.

Table 1.—Chemical treatments applied at monthly intervals to small-diameter scrub oak stems

Treatment	*How applied*	*Chemical*	*Concentration of dosage*
A	Basal spray	2,4,5-T[1]	1 gallon 2,4,5-T to 20 gallons oil
B	Stump spray	2,4,5-T	1 gallon 2,4,5-T to 20 gallons oil
C	Cups or V-notches	Ammate	1-1½ oz. (heaping tablespoon) crystals per notch
D	Cornell tool	Ammate	8 pounds Ammate to 1 gallon water

[1]Containing 4 pounds 2,4,5-T acid equivalent per gallon.

Results

All treatments, with the exception of Ammate applied with the Cornell tool, successfully eliminated most of the treated scrub oak (Table 2). Basal and stump spray results were generally good at all seasons, with the winter treatments the least effective. A poor kill was obtained in the fall with Ammate applied in notches, but results were extremely good at all other times. Although treatments with the Cornell

Table 2.—Mortality of scrub oak in relation to chemical control method and season of treatment

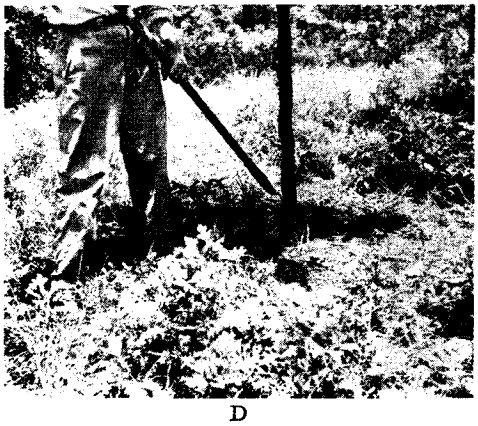
Season treated	*Ammate, Cornell tool Per cent*[1]	*Ammate, notches Per cent*	*Stump spray 2,4,5-T Per cent*	*Basal spray 2,4,5-T Per cent*
Spring (March, April, May)	10	87	83	80
Summer (June, July, August)	13	83	70	80
Fall (Sept., Oct., Nov.)	3	37	87	83
Winter (Dec., Jan., Feb.)	3	80	53	47

[1]Includes only those trees with both stem and roots dead two growing seasons after treatment.

A

B

C



D

tool using Ammate during the spring and summer were four times as effective as during the dormant seasons, the total kill was ineffective, and sprouting was extensive with this method.

Inasmuch as three treatments were about equally effective, the choice of which to use should depend on relative cost. Unfortunately, cost data could not be collected in this study. An earlier investigation on the Santee Experimental Forest showed that basal spraying with 2,4,5-T was almost as cheap as cutting the competing stems with a machete without chemical treatment. In contrast, where the competing stems were cut and the residual stumps sprayed with 2,4,5-T, the cost almost doubled. Direct comparisons with Ammate treatments were not made in that study. However, from the standpoint of application, basal sprays are more easily and rapidly applied to small-diameter stems and consequently should be cheaper. Under Sand Hill conditions, where extensive acreages of small-diameter stems are prevalent after clearing, the basal spray with 2,4, 5-T appears to be the most efficient treatment when cost and effectiveness are considered.

FIGURE 3.—*Various methods of chemically treating small-diameter scrub oak in the South Carolina Sandhills (A), Oil solution of 2,4,5-T applied as a basal spray in a band 12 inches high from ground level; (B), Oil solution of 2,4,5-T applied to cut stumps thoroughly wetted to the point of solution run-off; (C), Ammate applied in crystalline form at the rate of 1 heaping tablespoon per notch; (D), Ammate in the Cornell tool was applied at the rate of 1 jab per 2 inches of diameter.*

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