

SITE PREPARATION REQUIREMENTS FOR DIRECT SEEDING OF LONGLEAF AND SLASH PINES

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Site preparation requirements for direct seeding a species depend on the limiting environmental factors. These may vary within a region because of local differences in rainfall, soil moisture conditions, soil types, vegetative composition, and density conditions, biotic, or other influences. Obviously, basic knowledge of the whole complex of factors that are affected when sites are prepared as well as the silvical characteristics of the tree involved are essential in determining the need, the type, and intensity of site preparation required.

Let me illustrate briefly by considering some specific recommendations for site preparation when direct seeding longleaf pine (*Pinus palustris*) and both varieties of slash pine (*Pinus elliotii* var. *elliotii* and var. *densa*) in several areas in the South.

LONGLEAF PINE

In the early work with direct seeding, site preparation was recommended to overcome seed depredations by small rodents (2, 3, 4, 7, 10, 11, 13). Burning the rough was one method that proved to be quite successful. This type of site preparation provided a mineral soil seedbed and reduced the mechanical interference of a rough that often prevented the germinating seed from establishing its roots in the soil (4, 14).

Timing of the burn was found to be important because fresh burns would attract large flocks of migratory birds in the late fall and winter (9). Thus, burning the rough in the early spring prior to sowing in the late fall partly overcame the limiting factors of seed predators and seedbed condition. The necessity of timing site treatment for control of seed predators has been largely removed by the excellent work on chemical repellents (1). But on many sites in Louisiana burning is still done to improve the seedbed (2, 14).

Disking has been recommended and used on a commercial scale as a site treatment, particularly for dry sandy soils where lack of soil moisture may prevent the establishment of longleaf

(3, 6, 7). It has also been noted that elimination of grass competition by disking hastens longleaf height growth (6). Although faster growth may result on disked soil, there are several complicating factors that must be evaluated. Brownspot needle disease infection is often greater when mineral soil is exposed; some seed and seedlings are lost because of silting; and grazing may be excessive on disked areas if cattle cannot be controlled (3). Also the risk of cricket damage on certain sites may be increased with site preparation (12). Thus, the benefits of this type of site preparation have to be weighed carefully against the losses.

SLASH PINE

Slash pine appears not to be as exacting as longleaf in its site preparation requirements for stand establishment (10). Ground cover treatment is considered optional in southeast Texas and south Florida except when the vegetative cover is very dense (5, 13).

The mechanical interference of a very heavy accumulation of litter limits the establishment of slash pine seedlings, and its elimination is considered essential (4). Under such conditions, the recommendations for direct seeding slash pine on upland hardwood sites, where litter may be more of a problem than on flatwood sites, are: (1) burn the sites in November just before sowing, in order to eliminate heavy litter, and (2) eliminate overtopping hardwoods during the first summer after sowing (8).

In a series of tests in southeast Texas involving burning, disking, and control treatments, slash pine germinated best on disked sites but survival was best on the control plots. The poorer survival was attributed to higher solar radiation and soil temperatures on the more exposed treatments (13). Comparable field survival results were also obtained in a Mississippi study (4).

In south Florida, site preparation treatments such as chopping have not significantly affected seedling establishment under moderately dense cover conditions (5). The results of one south Florida study are given in Figure 1. This shows the number of seedlings per acre at 7 months, 1 year, and 2 years after sowing at three rates and with two site preparation treatments. Differences between sowing rates were highly significant, but those between site treatments were not. Growth up to 2 years was

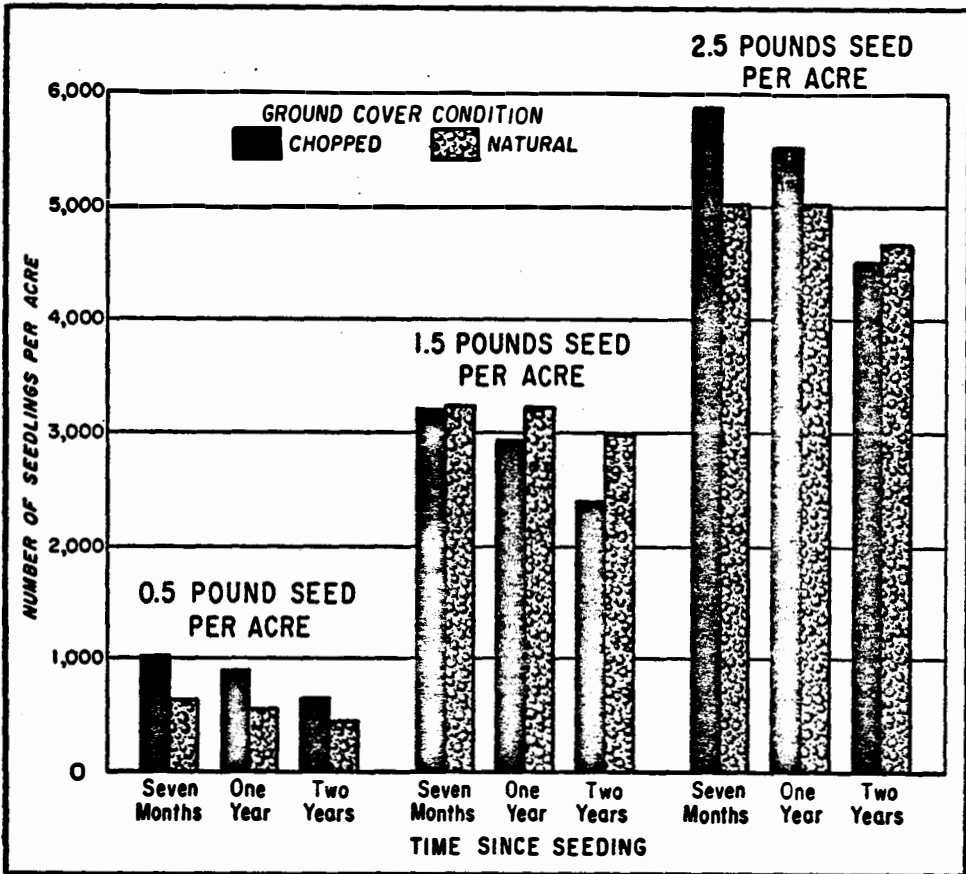


FIGURE 1—Establishment of slash pine seedlings sowed at three rates and with two site preparation treatments in south Florida.

not affected by site treatment either. Seedling heights averaged 10 inches at two years with no significant difference between the chopped and control plots.

Speaking now about recommendations for the south Florida area, it is my opinion that on flatwood sites where the sawpalmetto cover is light to only moderately dense, site preparation is not required for the establishment of a stand of slash pine by direct seeding. However, when the sawpalmetto cover is dense (i.e., where sawpalmetto has crowded out the wiregrass) site preparation will be required for seedling establishment, as well as for fire hazard reduction, and for facilitating later cutting operations in the stand.

CONCLUSIONS

Most of the preceding discussion has been centered on factors limiting initial stand establishment, because most site preparation research has been centered on this aspect.

The last thought I would like to leave with you is this: site preparation requirements will vary from area to area, and more specifically from site to site. Hence, a general prescription is neither possible nor desirable. But rather a basic knowledge of the silvical requirements of a species, and soil, and the biological factors that may limit survival and early growth is essential before determining site preparation requirements.

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DISCUSSION

MATHEWSON: I would like to ask Mr. Hill a question. You made the statement that planting is cheaper than direct seeding. Do you mean that more site preparation is needed for seeding than planting?

HILL: We have had to make a different type of site preparation for seeding. We can control hardwoods with a mechanical spray cheaper than we can clear mechanically. Spray does not reduce ground cover enough to direct seed.

KEEDWELL: You touched on slash pine and longleaf but still haven't gotten up into eastern North Carolina. I would like to know your recommendation for a recently cut over area with lots of stumps, briars, reeds, wet places, and so forth.

LANGDON: I am sorry, but I would have to see the site before making a recommendation.

CROSS: We have been working in this type for the last two years. I would suggest the use of fire, possibly in early fall or summer, preceding direct seeding in winter or spring. Also, disking helps. We have had fair success.

KEEDWELL: Did you disk directly after cutting?

CROSS: Yes, in the fall, then let the ground settle three or four months.

LEWIS: I believe that if you look in this crowd long enough you will find someone who has done it.

MAKI: You indicated that the half pound rate gave you about 850 seedlings to the acre. Do you have a distribution count?

LANGDON: Yes sir. At seven months we had 45 percent stocked plots. It dropped down to 650 in two years with about a third of the plots being stocked. On the higher rates, about two-thirds of the plots were stocked and at 2½ pounds about 85 percent stocked.