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Longleaf Note #4: Before Planting Dichotomous Key for Site Preparation on Agricultural Lands

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Applications to Restoration Ecology

Artificial regeneration of longleaf pine on agricultural lands has proven to be a particularly challenging endeavor. Frequently, the more fertile the site the better the chance one will incur a planting failure. Agricultural sites tend to have more aggressive herbaceous competitors than cutover areas. Planting failures are common in established bermuda, bahai, and fescue grass pastures. Studies conducted by The Longleaf Alliance indicate seedling survival is more dependent upon a proper site preparation prior to planting, than a correct herbaceous release following planting. Both a proper site preparation and herbaceous release are usually necessary to obtain acceptable survival and growth in the first few growing seasons. Scalping as a site preparation has proven beneficial on agricultural areas. Scalping may; reduce competition, improve moisture relationships, reduce insect predation on seedling roots, and reduce damage from certain pathogenic fungi. For best results, scalping, subsoiling (ripping), and planting should follow the contour of the land. *Scalping is not a feasible site preparation choice on wet sites or on sites with steep slopes.* Furthermore, research conducted by The Longleaf Alliance indicates that container-grown seedlings should be planted with the plug protruding 1-2" above the soil surface (in scalped rows) for optimum survival and growth.

As an additional caution, some sites that were once appropriate for longleaf, may be inappropriate owing to changes in soil pH or soil nutrient levels. Sites that have been heavily limed may be basic (>7.0 pH) rather than acidic (< 7.0 pH). Establishing pine trees on basic soils may prove difficult. Additionally, sites that have been repeatedly treated with chicken litter may have toxic concentrations of elements that would normally be beneficial to seedling survival and growth. Have the soils tested for acidity and soil nutrient levels prior to establishing any pine species on old fields or pastures.

Site is a pasture or an old field with grasses present (fescue, bahia, broomsage, bermuda) (go to A).

Site is an old field without a significant component of grasses (go to B).

A Bermuda grass is present. (go to A1)

Bermuda grass is not present. (go to A2)

A1 Recommended site preparation treatments in the order they should be applied:

1. Broadcast chemical site prep
2. Scalping
3. Subsoiling or ripping (**optional**, strongly recommended if hand-planting, or hardpan is present)

Chemical site preparation is necessary at highest recommended rates of glyphosate (Accord SP or Roundup) or imazpyr (Arsenal AC or Chopper) or a tank-mix thereof. Possible chemical site preparation rates are glyphosate at 5 quarts/acre (anytime grass is actively growing), Arsenal at 20 oz/acre (spring or early summer application), Chopper at 40 oz/acre (spring or summer application), or a tank-mix recommended by licensed herbicide applicators. Scalping should follow the chemical site preparation. Subsoiling should follow the scalping. The subsoiling (ripping) furrow should be to the

side of the scalped row rather than in the center of the scalped row. This will allow the seedling to be planted to the side of the rip and in the center of the scalped row. Do not plant seedlings directly in a subsoil/rip furrow. If bareroot seedlings are utilized, both the scalping and the subsoiling should be done at least 2 months prior to planting to allow some settling of the soil. Container seedling may be planted immediately after scalping and subsoiling provided that seedlings are not planted in the rip and the plug protrudes 1-2" above the soil surface. In all cases, subsoiling, scalping, and machine planting should follow the contour of the land.

A2 Recommended site preparation treatments in the order they should be applied:

1. Broadcast or banded chemical site prep (**optional**)
2. Scalping
3. Subsoiling or ripping (**optional**, strongly recommended if hand-planting or hardpan is present)

The scalping operation will yield the greatest benefits in seedlings survival. For grasses other than bermuda, herbicides may be applied at reduced rates as a broadcast or banded chemical site preparation. Possible chemical site preparation rates are glyphosate (Accord SP or Roundup) at 3 quarts/acre, 16 oz Arsenal, or a tank-mix of glyphosate and imazapyr applied while grasses are actively growing. Scalping should follow the chemical site preparation. Subsoiling should follow the scalping. The subsoiling (ripping) furrow should be to the side of the scalped row rather than in the center of the scalped row. This will allow the seedling to be planted to the side of the rip and in the center of the scalped row. Never plant seedlings directly in a subsoil/rip furrow. If bareroot seedlings are utilized both the scalping and the subsoiling should be done at least 2 months prior to planting to allow some settling of the soil. Container seedling may be planted immediately after scalping and subsoiling provided that seedlings are not planted in the rip and the plug protrudes 1-2" above the soil surface. In all cases, subsoiling, scalping, and machine planting should follow the contour of the land.

B Patches of bermuda grass or crabgrass are present (**go to B1**).
No bermuda or crabgrass are present (**go to B2**)

B1 Bermuda grass is present in patches (**go to B3**)
Only crabgrass (no bermuda) is/was present (**go to B4**)

B2 Site was in peanuts or soybeans, or ground was fallow for at least one year (**go to B4**)
Site was in other crop (cotton, corn, wheat, etc.) (**go to B5**)

B3 Recommended site preparation treatments in the order they should be applied:

1. Spot treat patches of bermuda grass with herbicide.
2. Scalping (**optional**)
3. Subsoiling or Ripping (**optional**, strongly recommended if hand-planting or hardpan is present)

Patches of bermuda grass may be sprayed with a 2% solution of glyphosate (Roundup or Accord SP). If bermuda grass patches cover more than 10% of the field, scalping is strongly recommended.

B4 Recommended site preparation treatments in the order they should be applied:

1. Scalping.
2. Subsoiling or Ripping (**optional**, strongly recommended if hand-planting or hardpan is present)

B5 Recommended site preparation treatments in the order they should be applied:

1. Scalping (**optional**)
2. Subsoiling or Ripping (**optional**, strongly recommended if hand-planting or hardpan is present)

If site was in cotton, plant tree seedling between rows of cotton stubble.