



# Longleaf Leaflet

LL-#4

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North Carolina Forest Service

## SUCCESSFULLY ESTABLISHING LONGLEAF PINE

Establishing longleaf pine can be difficult. Careful planning and attention to detail will increase your success. Longleaf pine has a distinctive initial growth phase called the “grass stage”, in which the young seedling looks like a clump of wire-needle grass. While in the grass stage, longleaf pine seedlings develop an extensive root system.

### Control of Competing Vegetation

The most important component for effective establishment and survival of longleaf pine tree seedlings is to adequately control competing vegetation throughout its grass stage. Longleaf pine does not begin height growth until the seedling’s root-stem (root collar) diameter is at least 1-inch. This initial diameter growth may take 2 or more years to accomplish. Young longleaf pine does not compete well with other plants. It is intolerant of shade and grows best in full sunlight.

- Competition from herbaceous vegetation, particularly grasses, is a primary contributor to seedling mortality.
- Competition for sunlight, soil moisture and nutrients slows the growth of the longleaf seedlings and prolongs the duration of the seedling’s initial developmental growth stage (called the ‘grass stage’).
- Controlling competing vegetation increases the survival rate of tree seedlings and shortens the time it takes for longleaf pine seedlings to begin height growth.

### Planning Steps

1. **Pick the right site.** Longleaf pine is well-suited for dry, infertile soils and does not like flooded or saturated soils. Longleaf struggles to become established in high quality and heavy-textured, clay soils increasing the risk of failure.
2. **Adequately prepare the site before you plant seedlings.** Longleaf pine does not tolerate shade or vegetative competition. Pastures, agriculture fields and high quality sites require the most intensive site preparation and control of competing vegetation.
3. **Containerized vs. bare-root seedlings:** Hand-planted, containerized seedlings survive better than bare-root seedlings. Bare-root seedlings survive best when machine-planted.
4. **Choose an experienced longleaf tree planter.** Longleaf pine seedlings are sensitive to improper handling, storage and improper planting.

### Site Preparation (‘site prep’)

Effective site prep is key to successful establishment of longleaf pine. Research shows that conducting intensive site prep and follow-up work to control competing vegetation will increase seedling survival and early growth.

The most effective methods of site prep can include some combination of the following practices:

- **Herbicides:** Newly planted longleaf pine seedlings are sensitive to high application rates of herbicides. Improved performance of the herbicide usually occurs when applied before planting trees.
- **Scalping:** This method removes the uppermost turf layer in old fields and pastures. Soil erosion management practices, such as scalping along the contours to control soil loss. Soil movement that covers the longleaf pine seedling may result in seedling mortality.
- **Drum chopping:** This method crushes un-desirable trees and vegetation and usually is followed by herbicide treatment or burning.
- **Burning:** Controlled burns remove competing vegetation and keep it in check while the longleaf pine seedlings are in the grass stage.
- **Bedding:** Bedding the soil on wetter sites keeps the seedling roots in a more favorable rooting zone that enhances soil aeration and improves survival and growth. Bedding can also reduce competing vegetation. Allow bedded sites to settle 2-3 months before planting.

### **Special Attention for Planting on Old Pastures and Fields**

Planting longleaf pine seedlings on old or abandoned fields and pastures requires more intensive site preparation. Old field sites often have excessive grasses and weeds, hardpans or compacted soil, and areas of poor drainage. Address these problem areas to increase establishment success.

- **Grasses and weeds:** These must be controlled prior to tree planting. Apply an appropriate herbicide in mid-to-late summer to control common weeds in old fields. For grass fields, it is suggested you apply the herbicide using broadcast-style in order to get more effective control of the entire site to be planted.
- **Hardpans:** Subsoiling is needed to fracture and break up soil with sub-surface “plow pans” or compacted soil that inhibit seedling root development. Tilling or disking the soil prior to planting can aid longleaf pine establishment by cultivating compacted soil and reducing the germination of weed seeds. However, tilling the soil makes it difficult to plant seedlings at the proper depth soon after the soil is tilled, and is not recommended. If you choose to till the soil, wait at least three months for the soil to adequately settle before you plant the seedlings.
- **Residual Effects:** Be aware that previous applications herbicides commonly used in soybean production may hinder establishment of pine seedlings. It is recommended that agricultural fields remain fallow for one year prior to planting longleaf seedlings. Avoid applications of animal litter because it can result in excessive weed growth.

### **Planting Do's and Don'ts**

- ✓ **Do** hire an experienced and well-supervised tree planting crew.
- ✓ **Do** plant early. Seedlings planted in the late fall tend to survive and grow better; this is particularly true for containerized seedlings. Longleaf pine can be planted from October through February. Late planting in March or April becomes increasingly risky.
- ✓ **Do** handle the seedlings carefully. Longleaf pine seedling roots are sensitive to rough handling and exposure to sun or wind.
- × **Do not** store bare-root seedlings for more than a week. Containerized seedlings store better, but should be planted as soon as possible after lifting. Keep stored seedlings from overheating or freezing.
- × **Do not** prune the root system. Create a larger and/or deeper planting hole.
- × **Do not** plant longleaf seedlings too deep or too shallow. The proper planting depth is where the bud is slightly above or at ground level, but never buried.
- × **Do not** plant in dry soils. While longleaf pine tolerates extended dry periods, it is safer to wait for adequate rain that will wet the soil before planting.

### **Competition Release after Planting**

Longleaf pine seedlings are susceptible to competing vegetation until tree height growth begins, usually 2-to-3 years after planting. Conduct an annual inspection in late March or early April to determine the need for competition control. Seek advice from a registered forester, licensed herbicide applicator or the N.C. Forest Service to determine the correct herbicide and application rate for the targeted vegetation.

### **Prescribed Burning after Establishment**

Longleaf pine is the most fire-tolerant of all the pines in the southern U.S. However, the tree is susceptible to fire damage soon after planting and during height growth. After the first growing season, the denser needle tuft will protect the tree's bud and the seedlings are more fire-tolerant of low intensity burns. The trees are most fire-tolerant when they are larger than 3-inches in diameter and taller than 12 feet.

Fire damage to pines depends on tree size and fire intensity. Potential loss increases with fire intensity. If you conduct a prescribed burn, you should expect some mortality and loss of growth to your trees. To set up a prescribed burn schedule, contact the local N.C. Forest Service office or visit the website [www.ncforestservice.gov](http://www.ncforestservice.gov).

### **More Information**

Detailed specifications for proper handling, storage and planting of bare-root and containerized longleaf pine seedlings are outlined in the “*Pocket Guide to Seedling Care & Planting Standards*” booklet printed by and available from the N.C. Division of Forest Resources. Longleaf pine seedlings can be purchased from either the N.C. Division of Forest Resources state nursery or from commercial nurseries.



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