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Longleaf Pine: Characteristics, Management, and Yields

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Background and Characteristics

• Longleaf pine (*Pinus palustris*) is a commercially important southern pine and is favored for lumber, poles, pilings, and pine straw.

• once occupied an estimated 60 to 90 million acres in the Southeastern U.S. but now occupies approximately 3.5 to 4 million acres as a dominant tree species

• Longleaf pine grows on sandy, well drained upland soils and in flatwoods, primarily along the Coastal Plain from Southeast Virginia to Eastern Texas, southward into central Florida and into the lower Piedmont of Alabama and Western Georgia.

• is tall, growing from 80-105 feet in height (maximum = 140 feet tall), and 2-2.5 feet in diameter (maximum = 4 feet), and can live to be 150 to 300 years old

Distinguishing Features

• Longleaf pine overlaps loblolly and slash pine species in its range and growth characteristics. Table 1 and photo 1 lists and illustrates some distinguishing features.

Table 1. Distinguishing features of three commercially important southern pines in Georgia

Species	Needle length	Needle bundle #	Cone stem	Cone length	Terminal bud diameter	Terminal bud color
Loblolly	5 - 9 “	3 occasionally 2	no	3 - 6”	1/8 - 1/4”	brown
Slash	7 - 11”	2 occasionally 3	yes	4 - 8”	1/4 - 3/8”	reddish, cinnamon
Longleaf	10 - 14”	3 occasionally 2	no	8 - 12”	3/8 - 1/2”	cinnamon w/ white hairs

Management

Longleaf pine’s growth rate on most soils is similar to slash pine after the first 10-years. Due to the moderate growth rate, relative intolerance to shade, high pine straw value and the potential for poles and pilings, longleaf pine lends itself to various levels of management, artificial regeneration (planting a site with a desired genetics and spacing versus relying on seed from a selection of trees from the current stand), or natural regeneration. To maximize early longleaf survival and growth the following management activities need to be performed:

(1) Some form of pre-plant site preparation is required to successfully establish longleaf pine; typically a chemical or mechanical treatment or a chemical/mechanical combination prior to

planting the site. The site prep goals are to minimize hardwood (on a cutover site) or herbaceous (on an old agricultural field site) vegetation, improve soil aeration/tilth, and maximize site quality so the seedlings can get optimal amounts of water, sunlight, and essential elements and have rapid root development.

(2) Order and purchase the best seedlings for your land / soils; typically order 550 to 725 seedlings per acre. Currently there are few genetically improved longleaf seedlings available.

(3) In most cases, have site prep done at least 2 to 6 months prior to planting to allow for soil settling if mechanical treatment is performed or if a herbicide is used with soil activity.

(4) Plant containerized seedlings from mid-September to mid-February and bareroot seedlings from mid-December to mid-February when the site has good soil moisture.

(5) Herbicides and/or fertilizers may be used post-plant depending on the need, expected longleaf pine response, cost, expected returns and time of expected returns.

(6) Thinning(s) are performed when pine basal area gets to 120 ft^2/acre or when live crown ratios are at 33% (60 feet tall trees with 20 feet of live crown = time to thin).

(7) Prescribe fire can be used in longleaf pine stands in their first year and throughout their life, but to be safe, some will burn with frequency starting when the trees are typically 15 to 20 feet tall and at least 3" groundline diameter.

(8) Where financial performance in a top priority, a final harvest may occur between ages 30- and 40-years. Pine straw raking can greatly improve financial performance with longleaf pine.

Longleaf pine Yields

Depending on the •site/soils, •land use history (old-field versus cut-over sites), •seedling quality and pine genetics (little genetic improvement as of 2011 for longleaf pine), •stocking, and •management longleaf can yield from as little as 3/4 cords/ac/yr (2 tons/ac/yr) to 2.5 cords/ac/yr (6.5 tons/ac/yr) during the first 20- to 25-years. The figure below is an example of longleaf pine yields under a moderate level of management and growth rate for a 33-year (Figure 1) rotation. Individual site yields will vary. Recent work done by UGA Warnell School faculty measured planted longleaf pine growth on old-field sites at 2.2 to 2.4 cords/ac/yr (6.0 to 6.5 tons/ac/yr) through age 21-years. Longleaf pine growth on high site index, former pasture sites in Louisiana and Texas ranged from 2.1, (5.7 tons/ac/yr), 1.9 (5.1 tons/ac/yr), and 1.3 cords/ac/yr (3.5 tons/ac/yr) at age 30-, 40- and 50-years, respectively.

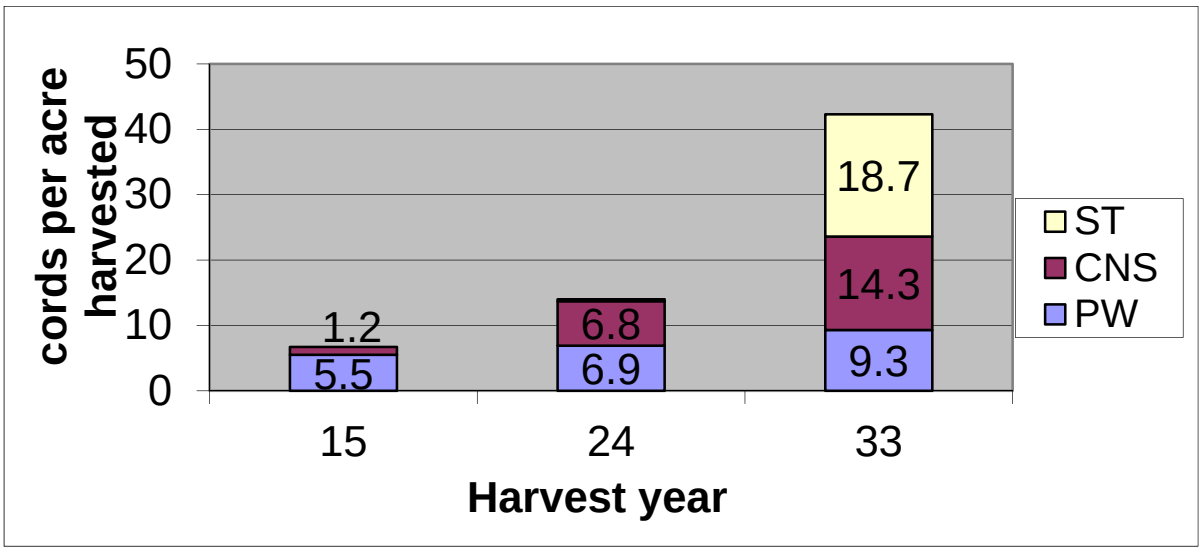

Figure 1. Longleaf pine yields of pulpwood (PW), chip-n-saw (CNS), and sawtimber (ST) at a 33-year rotation (thin @ age 15- and 24-yrs) with a mean annual increment of 1.9 cords/ac/yr. One cord wood+bark=2.7tons

Photo 1. Longleaf pine needle (12-14 inches; typically in fascicles of three), cone (sessile base; no stem, 6-10 inches long) and terminal bud (largest diameter compared to loblolly and slash pine) characteristics.

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