

# 3 THE MAJOR SOUTHERN PINES

Michael J. Walterscheid  
TX Agricultural Extension Service



Loblolly Pine

Loblolly pine (*Pinus taeda* L.) has the second largest range of the southern pines, but because of its site adaptability, high yields, and ease of seed and nursery management, it is the most widely planted and utilized pine in the South. It occurs naturally on the coastal plain from New Jersey to Florida and west to Texas, throughout the Piedmont, and into Tennessee, Arkansas, and Oklahoma. The factor limiting further northward expansion of the range is temperature, and westward expansion is limited by rainfall and soil conditions. (Range MAP Figure 1)

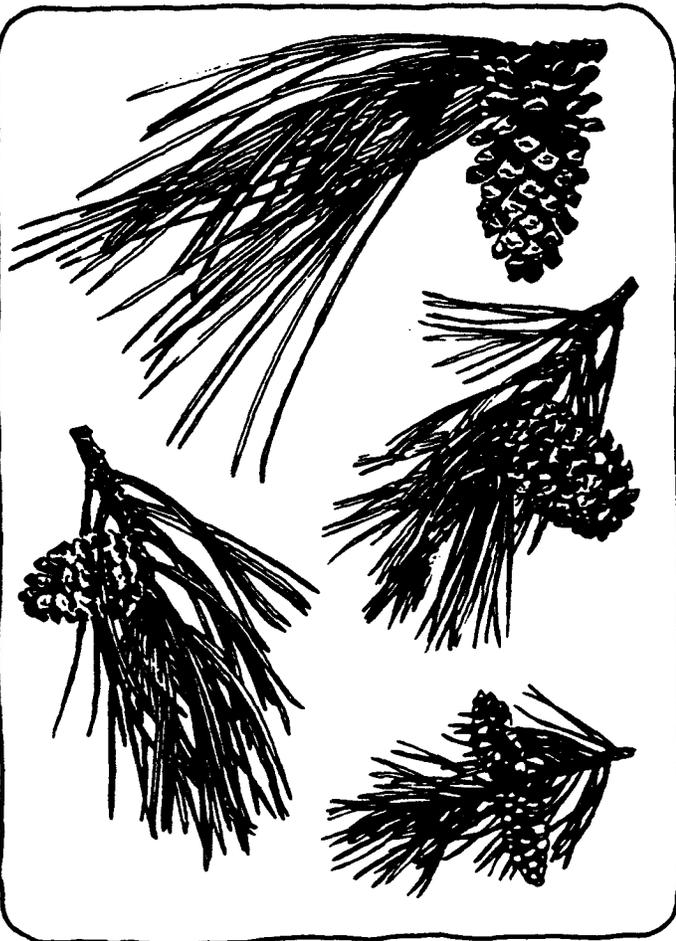
There are some drawbacks to loblolly pine. Those found east of the Mississippi River are often highly susceptible to fusiform rust which can cause mortality in planted sites. Nantucket Pine tip moth can seriously attack young trees, causing a slowdown in growth until the trees reach a height of about 20 feet. Of the four major southern pines, it is the most susceptible to fire damage.

Loblolly pine occurs on a wide variety of soils, but grows best in sods with poor surface drainage, a deep surface layer, and a firm subsoil. In the coastal plain, the productivity of soils decrease with improvement in surface drainage. The presence of a hardpan, as well as excessively drained sands, can reduce productivity.

Off the coastal plain, loblolly site quality generally increases from ridge tops to bottoms due to such soil differences as surface soil thickness and past land-use practices. Erosion has contributed to poor site quality on ridges.

Pure loblolly stands can be found throughout its range; but, quite often, it is mixed with sweetgum, shortleaf pine, and various oaks. On wetter sites, it can be found associated with sweetbay, sweetgum, green ash, and red maple.

Loblolly pine produces seed as early as ten years, but abundant production does not occur until trees are 30 to 50 years old. Some seed is produced every year, and, good crops occur on a 3- to 5-year basis. It usually falls within 300 feet of tile tree. Studies have shown that one



## THIS FORESTRY PUBLICATION IS ONE OF A SERIES ON SOUTHERN PINE MANAGEMENT.

1. The Southern Pine Forest
2. Forestry as an Investment
3. The Major Southern Pines
4. Importance of Soil to Tree Growth
5. Regenerating Southern Pines
6. Intermediate Stand Management
7. Pine Insects, Diseases & Wildfire
8. Timber and Wildlife
9. Harvesting Southern Pines
10. Marketing Southern Pines
11. Forestry Terms (Glossary)
12. Forestry Assistance Available

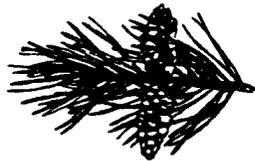
out of nine seeds produces one seedling on a fresh seedbed, one out of 15 on a burned surface, and one out of 40 on undisturbed litter or jogging debris.

During the first five to ten years, height growth may average 2.5 feet per year. The best growth rate is obtained in open areas and the least under a full canopy. Competition from hardwoods reduces height growth and often kills the young trees. If the seedlings can survive the first three years, the chances are good for continued survival.

As trees mature, they outgrow the hardwood competition, but hardwoods can readily become established in the understory of loblolly pine stands. Periodic prescribed burning can reduce this competition.

Loblolly pine prunes itself at an early age, making it a desirable species for timber users. The main uses of loblolly pine are for softwood lumber and pulpwood, actual use depending on the size of the tree harvested. Plywood producers have become major users in recent years. The better trees in many stands can be used for poles and piling.

### Shortleaf Pine



Shortleaf pine (*Pinus echinata* Mill) has the widest natural range of the four principal southern pines. It is found in 22 states, extending from extreme southeastern New York through southern Ohio; southern Illinois, Missouri and Oklahoma; south to eastern Texas, and east to Florida. The northern and western range appears to be limited by winter precipitation. (Range Map Figure 2)

Shortleaf pine does not prune well naturally, with dead lower branches persisting for as long as 50 years. It does, however, grow rapidly, produces high quality wood, and sprouts readily. The rapid sprouting is a distinct advantage if a young stand is burned. Shortleaf pine withstands ice damage better than any other of the four principal southern pines. It is damaged easily by Nantucket Pine tip moth and does not recover as readily as loblolly pine. It is not readily infected with fusiform rust, but a closely related disease, eastern gall rust, can severely infect some stands. The most serious problem associated with shortleaf pine is littleleaf disease, a soil-bane disease, which slows growth dramatically and will kill mature trees.

Shortleaf pine has the ability to grow on a wide variety of soils. In the Piedmont, site quality is related to the depth of the surface soil and consistency of the subsoil. The best combination is surface soil over nine inches deep and friable subsoil. The best sites are fine sandy loams or silt loams with good internal drainage; these are often found in the flood plains of small streams. Usually, sandy soils with excessive internal drainage are very poor shortleaf sites. It will grow on all aspects and ridge

tops in the Southeast up to 3,000 feet. Best development is found from 600 to 1500 feet in the Piedmont and 150 to 1000 feet in Arkansas and Louisiana.

Pure stands of shortleaf pine are found in some areas, but, quite often, it is mixed with loblolly pine which has a similar range. In many parts of its range, shortleaf is found with various species of oak in mixed stands.

Seeds of shortleaf pine begin to fall in late October, and over 70 percent of the seed falls during the first month. Cones will stay on a tree long after they are empty, giving an impression of a large seed crop each year. As with loblolly pine, some seed is produced each year, but good crops occur at intervals from 3 to 10 years. Most of the seed falls within 250 feet of the tree.

As with other pines, a prepared seedbed will result in the best seedling crop. The average height growth is about 2.5 feet per year. Competition must be removed, or seedling survival will be extremely low and the growth will be slow.

Shortleaf pine reproduction will persist in very dense stands. However, to obtain the best growth, a release cut is often necessary in natural stands.

The uses of shortleaf pine are much the same as for loblolly. Sawtimber and pulpwood make up the greatest portion of uses, and poles are cut from good stands. In certain areas, there is also a market for peeler logs for the pulpwood industry.

### Slash Pine



Slash pine (*Pinus eliottii* Engelm, var *elliottii*) has the most restricted range of the four major southern pines. It extends from the coastal plain of South Carolina to extreme southeastern Louisiana. Its range has been extended westward by plantings in western Louisiana and Texas where it now reproduces naturally. Rainfall is believed to be the major limiting factor to the northward and westward range of slash pine. Another factor restricting its range is its susceptibility to breakage during ice storms, especially in thinned plantations. (Range Map Figure 3)

The early widespread acceptance of slash pine west of the Mississippi River has been dampened by its susceptibility to fusiform rust. In east Texas plantations where slash pine and loblolly pine have been planted together, the slash pine will have up to five times more fusiform rust than loblolly.

The species is easy to manage in nurseries. It is a better natural pruner than loblolly or shortleaf pine. Slash pine grows best on sandy soils underlain with poorly defined hardpans 18 to 24 inches deep. Its juvenile fire

susceptibility has, until recently, confined it to wet areas of the flatwoods and in narrow bands along creeks and other drainages. Deep well-drained sands or very poorly drained sites are least productive. Changes of elevation of one to two feet in the flatwood areas can result in a pronounced change in site quality.

There are few large native stands of slash pine. Although several species are associated with slash pine throughout its range, it is often associated with longleaf pine. Many of the hardwoods that do well on moist sites, such as water oak, swamp tupelo, and redgum, are also found with slash pine. An association with cabbage palmetto is widespread throughout its range.

Slash pines begin to bear cones in large numbers when they are 20 years old, and good seed crops occur about every three years. Most slash pine seeds fall during October, and, about 90 percent of them fall within 150 feet of their source.

Early growth of slash pine is good, with an average five-year growth of 10 feet. On some good sites, trees five years old have been measured at 20 feet. Slash pine can be managed in either single-age or even-age stands; but, because of its susceptibility to fire, it is easier to manage in even-age stands. Old field sites have better growth than forest sites because of lack of competition at an early age.

Slash pine has many of the same uses as the other major southern pines -- sawtimber, pulpwood, poles, and peeler logs. Additionally, slash pine is a good source of naval stores; in the past, it was heavily worked for turpentine production.



Longleaf Pine

Longleaf pine (*Pinus palustris mill*) is found in the coastal plain from Virginia to southern Florida and west to eastern Texas. There is some northward extension of the range to the Appalachian foothills of northern Alabama and Georgia. (Range Map Figure 4)

Longleaf has several advantages over the other major southern pines; 1) it will grow at an acceptable rate on soils too poor for the other pines, 2) it is resistant to fusiform rust, and 3) it is resistant to fire. It also has several distinct disadvantages: 1) it is highly susceptible to brown spot needle blight which can cause slow growth and eventually kill the seedling, and 2) it remains in a "grass stage" for three to seven years and occasionally up to 20 years. During the grass stage, there is little height and diameter growth, but there is

extensive root growth. After the grass stage, the growth can be quite comparable to other southern pines, but the three-to five-year loss in growth can be quite costly, especially with the present-day shorter rotations. There are, however, some sites where longleaf would be the only acceptable species. It will occur in stands with the other southern pines and hardwoods.

A longleaf pine generally does not bear seed until it is about six inches in diameter. Open grown trees will bear some seed every year; but, generally, the seed crops are quite sporadic, and good crops occur infrequently. The seeds begin to fall in September and remain within 100 feet of their source.

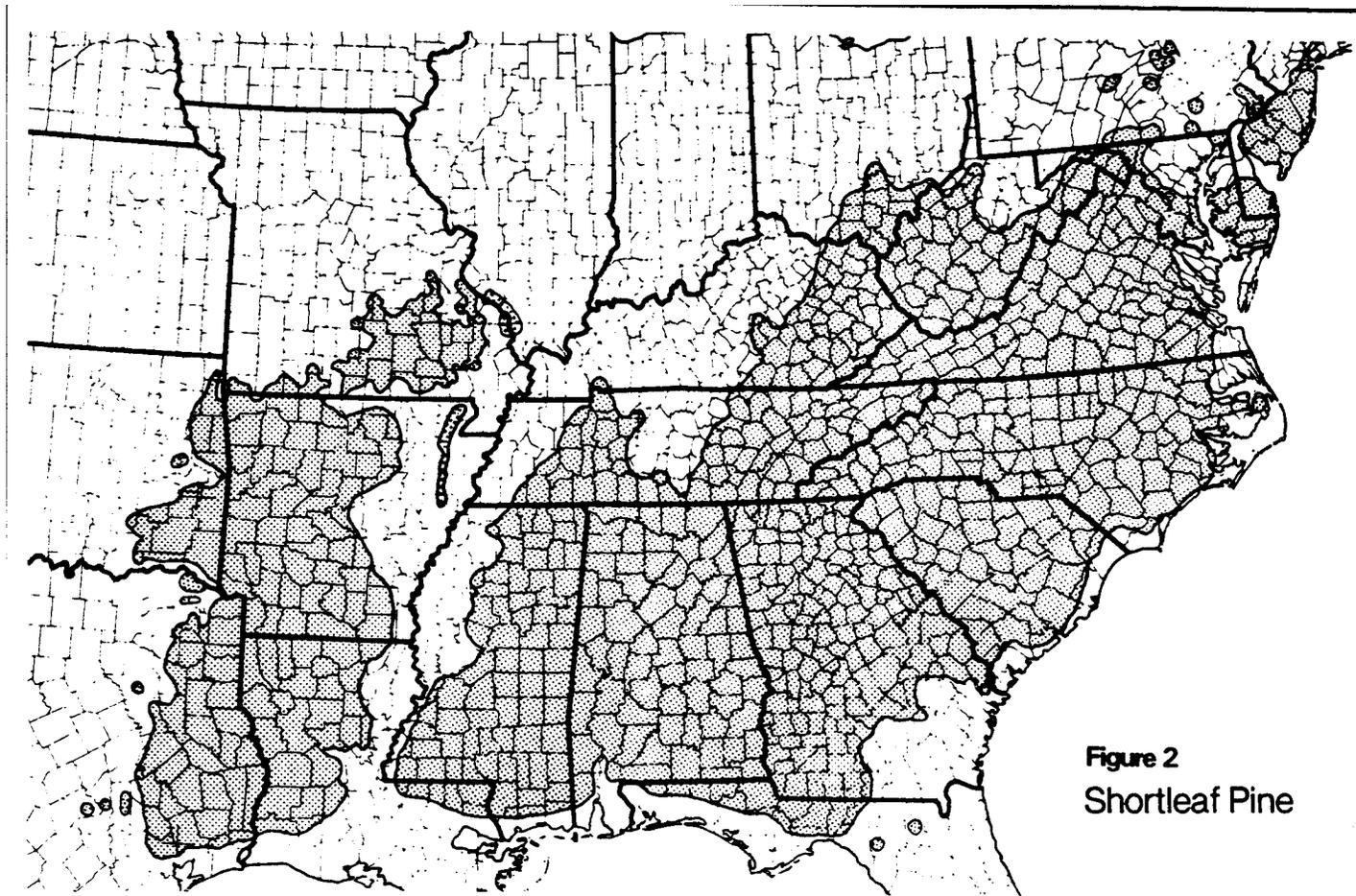
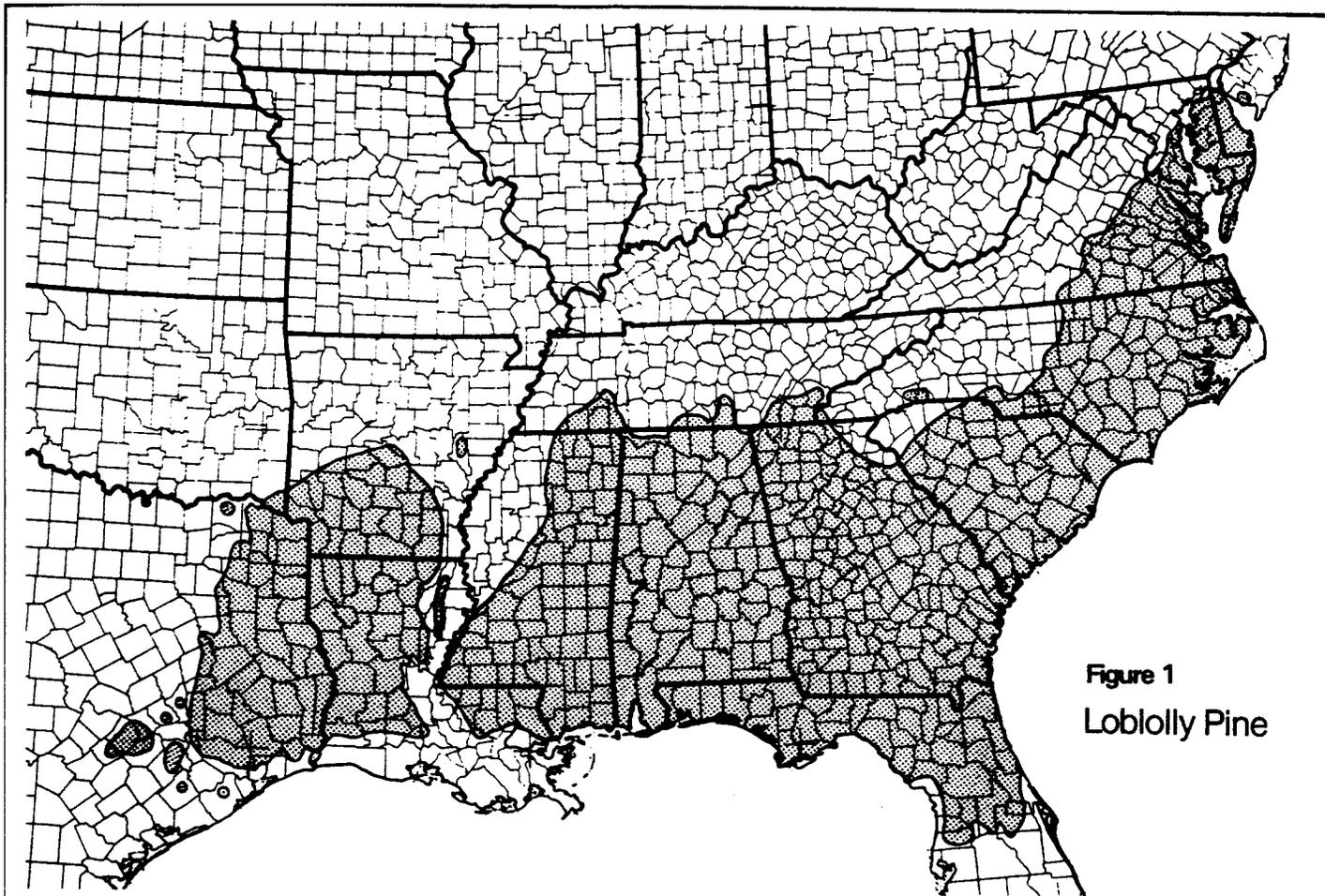
Burning of the grass and litter just prior to seedfall will produce a good seedbed. The seed germinates rather easily, but seedlings tend to remain in the grass stage for a prolonged period of time. Saplings will grow one to three feet per year after emerging from the grass stage.

Longleaf pine is one of the finest timber trees, but it does not produce large volumes per acre. It cannot do well in competition or heavy shade and will soon be overtopped by other pines or hardwoods. Prescribed fire is one of the best management tools for longleaf pine.

Longleaf pine is an excellent source of naval stores. Many stands in the past were worked for turpentine and rosin as well as for timber production. Since stands are not extremely dense, there is less pulpwood production in longleaf pine than the other southern pines. There is considerable sawtimber and pole production from quality stands.



These publications developed jointly by:  
Cooperative Extension Service  
USDA Forest Service  
Southern Region



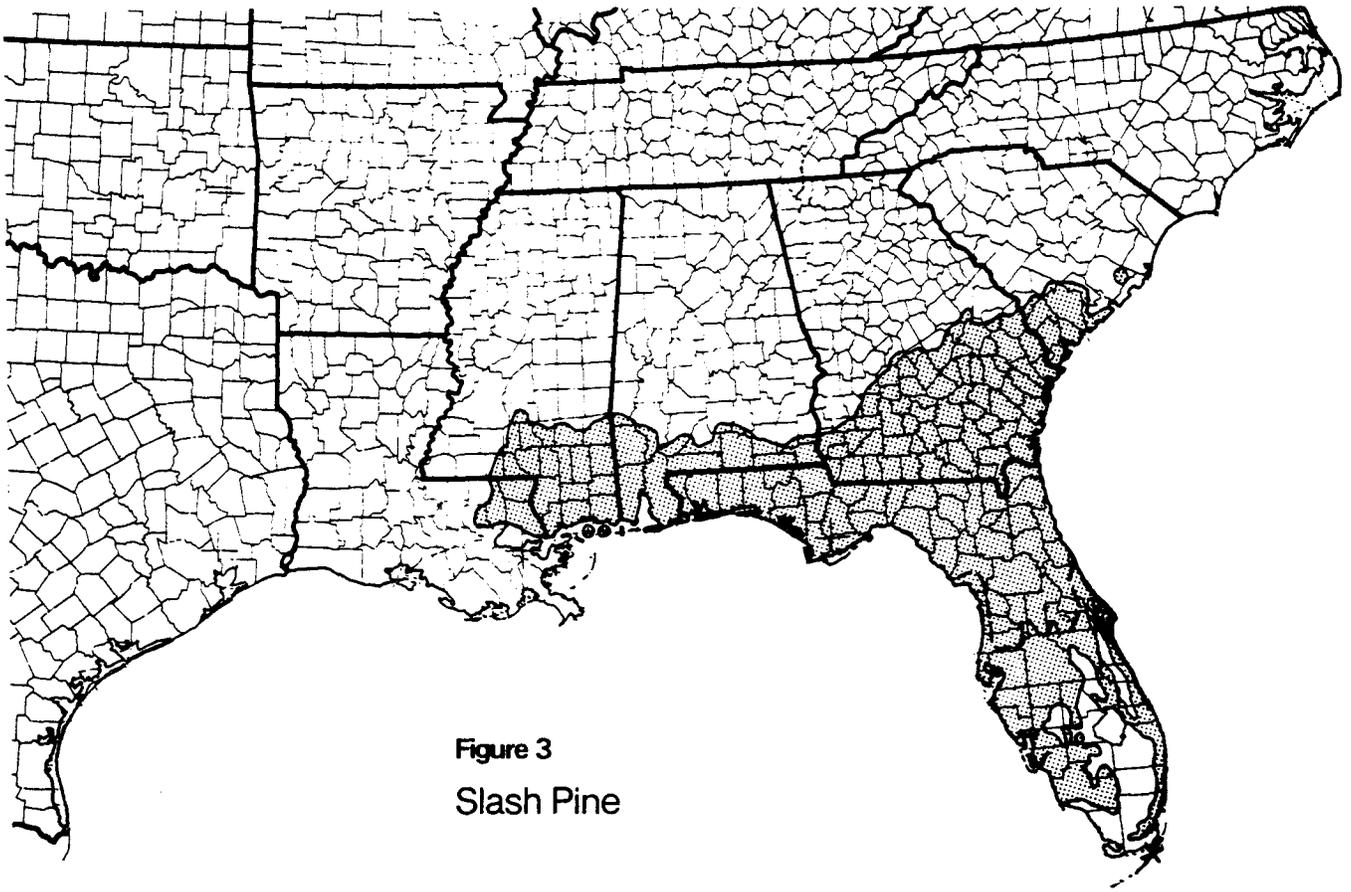


Figure 3  
Slash Pine

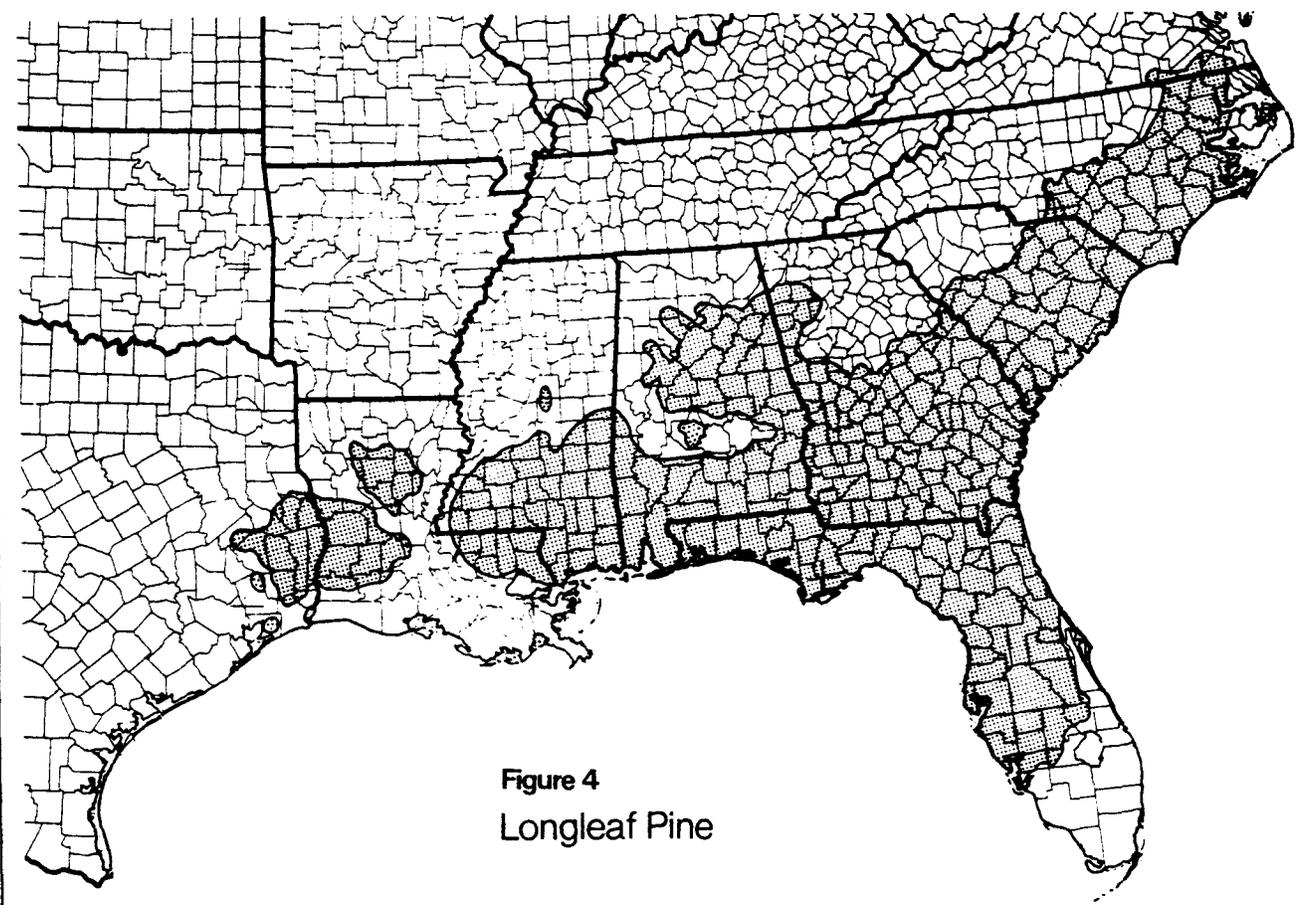


Figure 4  
Longleaf Pine