

Pine Silvopasture Establishment and Management

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Sources: Bugwood.org, (Silvopasture Establishment & Management Principles for Pine Forests in the Southeast), CEFS Agroforestry Research, Buron Lanier, Dr. Miguel Castillo

Silvopasture :

- Trees, livestock, and forages Integrated into a single system on one site.



Brian Parrish

Silvopasture Concerns

- Can't leave animals in one place for long periods
- Soil compaction, damaged roots, insects, disease
- Tree species to use if planting? Match tree to site
- Orientation of trees and fencing for future harvests



Brian Parrish

Silvopasture Tree Spacing

- Trees Grown in lower densities than traditional forests
- Start with 300 to 400 trees per acre
- Thinned over time to 50 to 150 trees per acre
- Buron Lanier Farm - 80 trees per acre at final thin



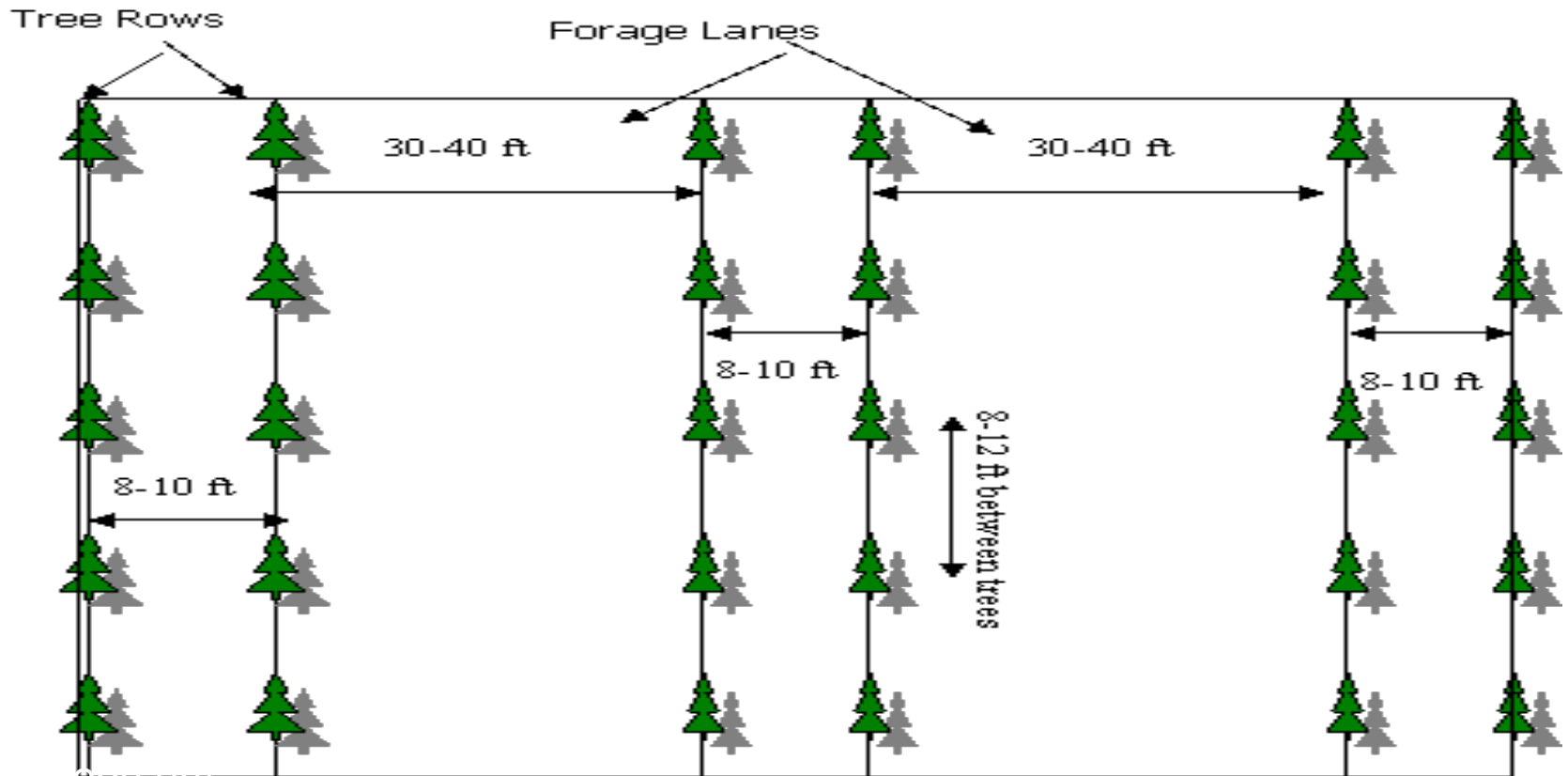
Silvopasture Tree Spacing

- Double Row System Considered Optimum
- Triple, Quadruple Rows “Middle Rows” Grow Slower Than Outer Rows



Traditional Silvopasture Spacing

250 Trees per acre





Bugwood.org

Tree Spacing

- Loblolly trees planted 10' to 12' apart in the row
- Loblolly rows 10' apart
- Thinning take out every 4th row in first thinning
- Then take out every 2nd row in second thinning
- May give best mix of trees and grass?
- Tree orientation: Match for ease of harvest

Tree Spacing

- Take out 2 rows and leave 2 rows
- Randomly thin existing stands
- Can just start with single rows
- Match tree spacing to farm equipment used
- Silvopasture works best when trees are in rows



Tree Thinning – Natural Stands

- Use tree selection similar to crop tree release
- Identify best / fast growing / straight trees
- Thin around best trees
- Thin for light and tree quality
- Want to end up with more straight pole logs \$
- Chipper- when used loggers tend to chip more of tree tops, can cut down on pulpwood tonnage landowner is paid for \$.

Tree Thinning

- When canopy closure begins reaching 50% a thinning should be considered (per densiometer reading)
- Prescribe burn after thinning (clean up debris)
- Consultant can help
- Mark trees to be saved at chest and ground level
- Take trees to deck for limbing (avoid damage and debris)





Tree Canopy

- 25% to 45% Tree Canopy for Warm Season Grasses
- 40% to 60% Tree Canopy for Cool Season Grasses



How to Measure Tree Canopy

- A spherical Densiometer is used to measure tree canopy
- Hold densiometer level in front of body
- Count and record the number of grid squares that are more than $\frac{3}{4}$ filled and divide by 24 (The total number of grid squares) to calculate the percent coverage.



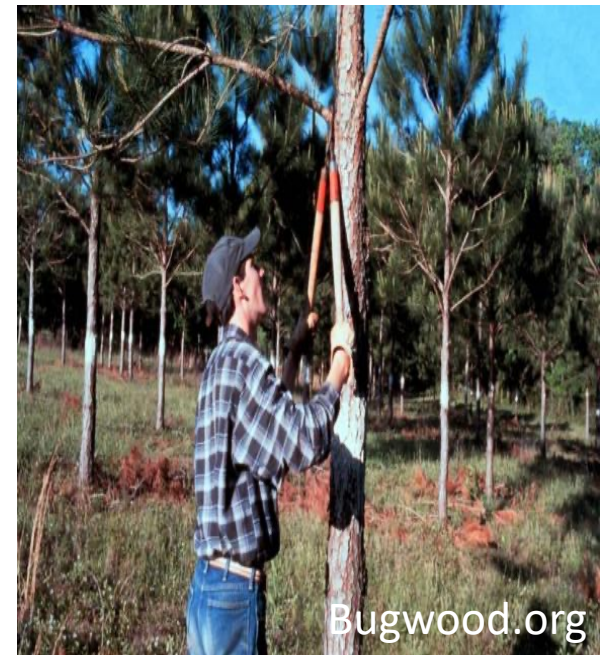
Silvopasture Concerns

- Log quality impacts: limbs / epicormic branch development



Tree Pruning

- Confines knots to small diameter
- First pruning when trees 15' to 20' tall
- Late winter or early spring
- Goal is 18' to 32' knot free trunk
- Can allow trees to self prune
- Will pruning pay?
- Want limbs higher than tractor Cab



Site Preparation

- Disking
 - Subsoiling or ripping
 - Herbicide treatments
-
- Each of these methods are used to help loosen the soil for good root growth and reduce the level of competition from grass and weeds until trees can become established

Planting Trees in Existing Pasture

- Rows can be established
- Tilling
- Subsoiling to 18" to 24"



Planting Trees in Existing Pasture



Photo by Jeff Tapley

- Herbicides for weed and grass control: Oust, Oustar, Milestone, Arsenal, Fusilade, RoundUp, Accord, Velpar, Garlon, Frequency
- Avoid direct contact with seedlings unless specified by the label.

Herbicide Treatments

- Herbicide treatments after planting trees are recommended for better tree survival. Weeds often quickly reestablish in newly planted rows after disking.
- Banded or spot-herbicides used along tree rows during the first two years after planting is effective in controlling unwanted vegetation

Forage, Trees, and Herbicides

- Care must be taken for herbicide applications for both the tree seedlings and forage components
- Newly planted tree seedlings are more susceptible to herbicide drift damage



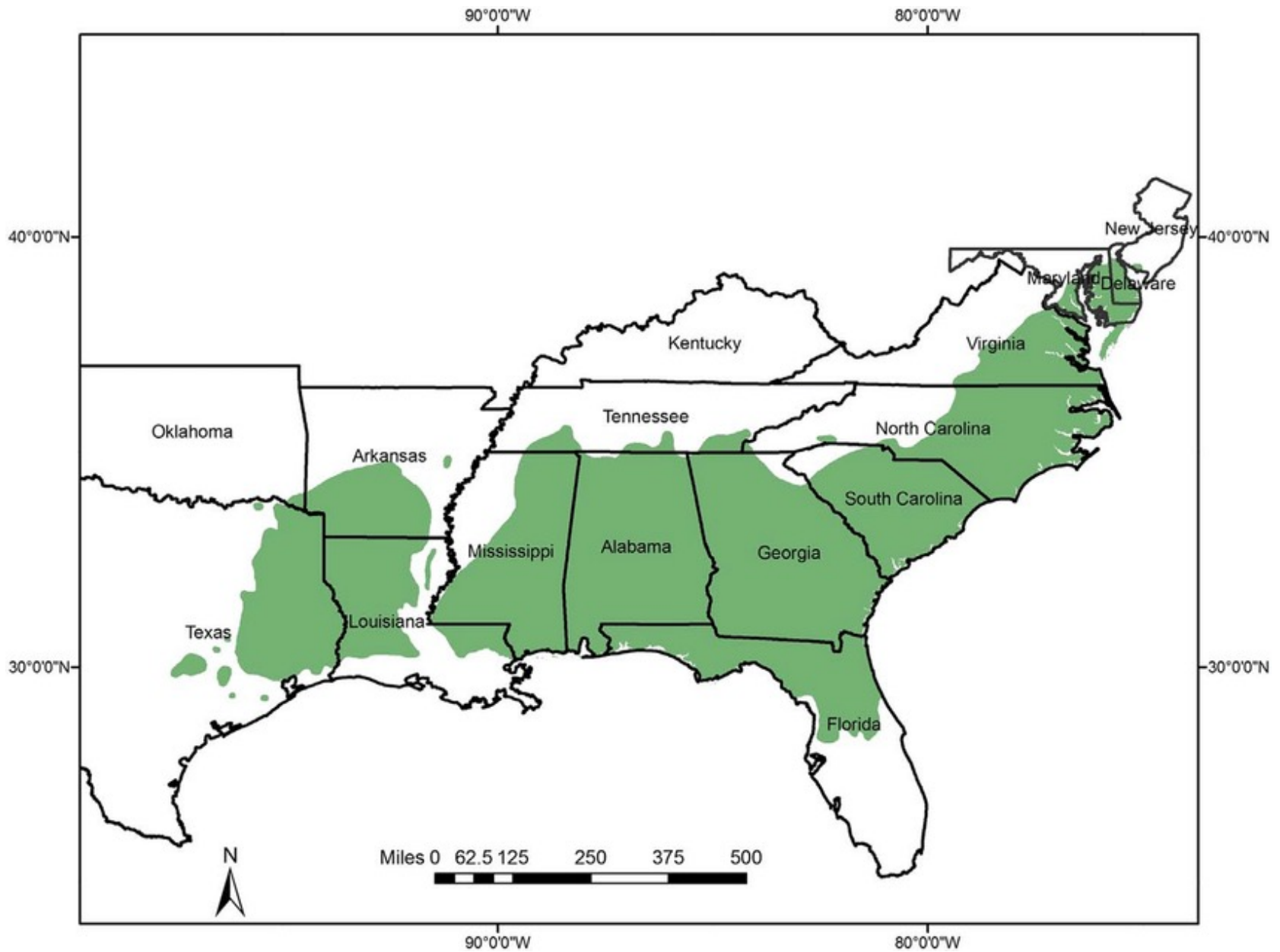
Mowing and Haying

- Mowing between tree rows during the first three growing seasons after tree planting will help reduce weed and grass competition
- Where possible, haying can also provide revenue from forage (or defray costs) before cattle are allowed to graze the site.



Loblolly Pine

- Fastest growing pine species
- Very versatile for range and site conditions
- Most commonly planted pine species
- Improved varieties available to reduce rotation length
- Choose Fusiform Rust Resistant Trees
- Thinning for pulpwood 12-15 years (coastal plain)
- Chip and saw, saw timber 22-35 years (coastal plain)
- Can be fertilized with 2 to 3 tons / acre broiler litter
- More branches= (more shade) can require more pruning
- Trees need to be 5 to 8 years old for animals access



Pinus taeda L. range. Source: USGS Digital Representations of Tree Species Range Maps, available at <http://esp.cr.usgs.gov/data/little/>.

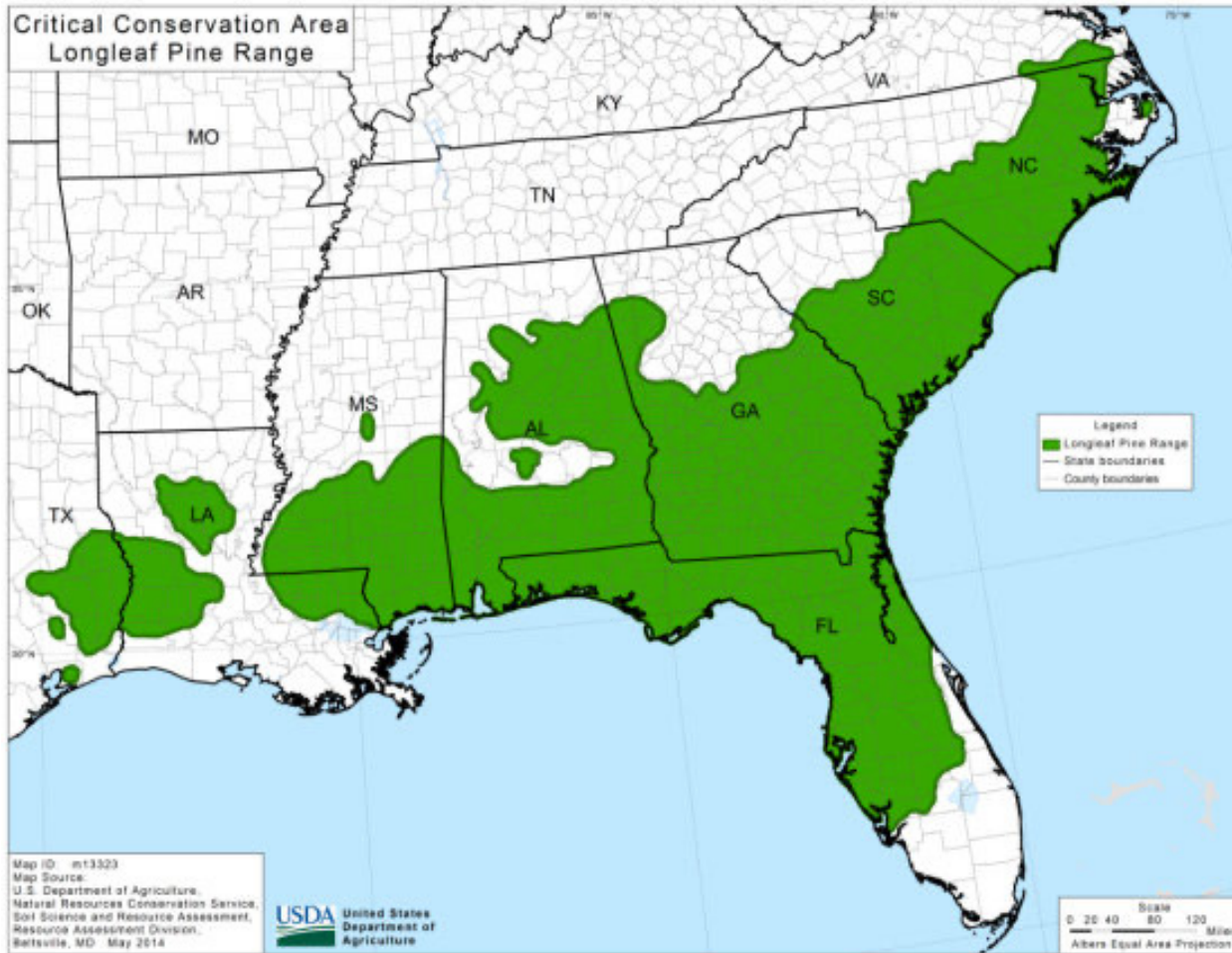
Longleaf Pine

- At one time covered 2/3 of the southeast
- Can be planted on a wide variety of soils
- Is very well suited to dry and infertile sites
- Does not grow well on flooded, saturated, or heavy clay soils
- Traditionally has had a longer rotation cycle
- More difficult to establish than loblolly pine and more management will be required.

Longleaf Pine

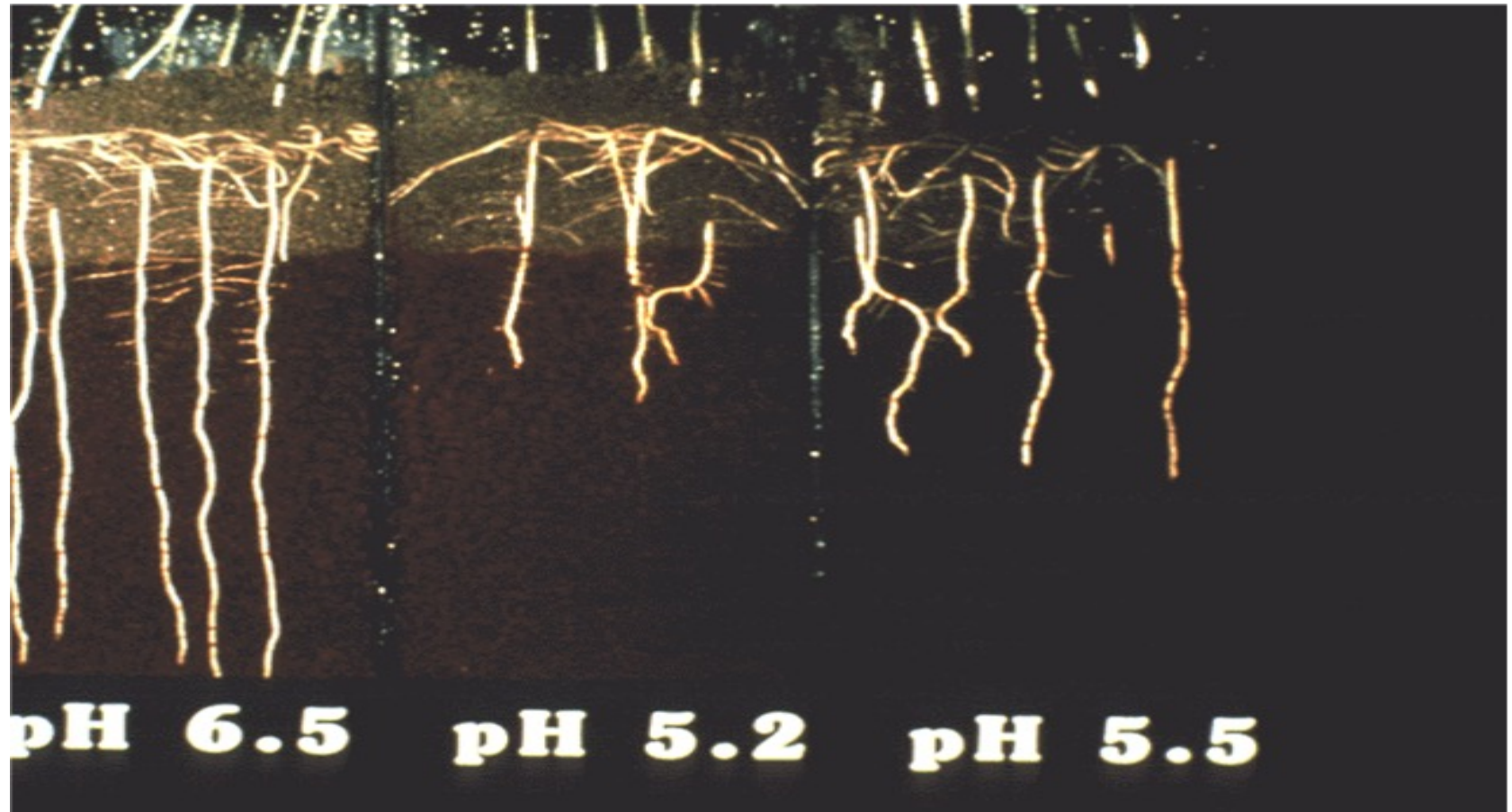
- High quality timber
- Burning & herbicide – can help get trees up faster
- Chip and saw timber at 30-45 years
- High quality pine straw \$\$
- Long living pine species
- Be very careful with fertilization !!
- Low fertilization species !!
- pH at 5.0 to 5.5 at highest !!





The historic longleaf pine range across the southeastern U.S.. Map taken from the USDA website (Natural Resource Conservation Service)

Longleaf Pine pH of 5 to 5.5 Max









Cows will clean up and eat small maples



Try not to leave bad trees at thinning







Questions?



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