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# Loblolly Pine Decline

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A phenomenon known as Loblolly Pine (*Pinus taeda*) Decline is now used to describe drastic decreases in tree health, growth rates, and ongoing mortality in stands. Stands suffering from LPD are characterized by thinning and yellowing crowns, reduced radial growth, deterioration of fine feeder root systems, and increased mortality rates on an ongoing basis beginning in stands as young as 29 years of age. This problem occurs in the upper coastal plain and lower piedmont regions of Georgia, and seems to be most widespread in the west central portion south of Columbus. The LPD problem has been recognized by resource managers since the early 1960's and although scientists have studied the problem for several decades, the best indication is that a variety of environmental, insect, and pathogen agents are likely working collectively to cause this decline/mortality complex that is impacting such a widespread region.

It is unclear the exact roles root pathogens play in the LPD complex, but they are likely a contributing factor. Hess's study found a high correlation between feeder root decline and LPD so root mortality is considered to be at least one of the factors involved. Other factors can also cause damage to root systems including drought, wind, insects, equipment and fire. The most common initial symptoms above ground are very thin crowns that only have needles tufted on the branch ends and may be yellowish in appearance (right). The symptoms closely resembled those associated with littleleaf disease caused by. This pathogen is most commonly associated with Shortleaf Pine (*Pinus echinata*) on specific types of sites. This pathogen, along with another common root pathogen (*Leptographium spp.*); have been consistently found on sites suffering from LPD in east central Alabama (Hess, N.J. et al., 2002). Many of the stands are older (sawtimber), and found on upland sites that suffer drought periodically. Almost all of the sites had a previous farming history and widespread topsoil losses occurred throughout most of this region. Both of these factors likely play a role in stressing stands and predisposing them to decimating factors such as LPD.



Loblolly Pine is not considered to be long-lived tree and although 150+ year old trees are known and not rare under ideal conditions, this is the exception rather than rule. Growth rates on heavily eroded, upland sites in this region of the state decline rapidly after age 40 and older stands are generally considered to be lower vigor and more prone to all types of decimating agents. For this reason, sites that have a known history of LPD should be evaluated for regenerating to Longleaf Pine (*Pinus palustris*) if this is a suitable species for the specific site. Longleaf is a much longer lived species that is less prone to drought and adapted to sandy sites. Furthermore, pine bark beetles have traditionally been a problem throughout the central region of Georgia, and Longleaf has a natural resistance to these insects.

Research is ongoing with LPD, and perhaps we will eventually understand the entire complex of agents that cause this decline/mortality issue. Each site that suffers from LPD may differ but some of the factors that may be involved are: poor site quality, limited top soil and nutrient availability, drought, root insects and pathogens, bark beetles, storm or fire damage, species not properly matched to site, and stand density and age. For land managers, however, there are no clear management strategies for Loblolly to avoid the Decline or correct the problem once it is recognized. Stands that must be clearcut prematurely due to LPD should be carefully evaluated by a professional forester, and species selection and silvicultural activities should be considered before reforesting the site.

Literature Cited: Hess, Nolan J.; Orosina, William J.; Carter, Emily A.; Steinman, Jim R.; Jones, John P.; Eckhardt, Lori G.; Weber, Ann M.; Walkinshaw, Charles H. 2002. *Assessment of Loblolly Pine Decline in Central Alabama*. Gen. Tech. Rep. SRS-48. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. pp 558-564