LONGLEAF PINE GROWN IN VIRGINIA: A PROVENANCE TEST

Kurt Johnsen[1], Jerre Creighton, Chris Maier

[1]US Forest Service Southern Research Station, Research Triangle Park, NC

In 2006 the Virginia Department of Forestry established a longleaf pine provenance test on three sites near New Kent, VA, near the most northern native range of Longleaf pine. The provenances originated from native trees in Virginia, natural stands and a seed orchard in North Carolina, and natural stands in South Carolina, Georgia, Florida, Alabama, and Mississippi. The provenances were grown on three sites, two previous nursery sites (irrigated during year one) and a cut-over site (not irrigated). On average, survival ranged from 86 to 58% showing no clear clinal pattern although the Virginia source had the highest survival. At age three, growth was greatest for the VA trees and decreased in a mostly clinal pattern. By age 5, height of the provenances on the nursery sites had largely converged while the clinal pattern was maintained on the lower productivity cutover site. At the end of the fifth growing season, foliage was collected for carbon isotope discrimination (delta13C) and natural abundance of 15N. Water use efficiency (via delta13C) was greatest in the VA trees. A relationship between height and delta13C was only observed ($r = -0.55$) on the cut-over site and the negative relationship indicates variation in delta13C was due to differences in photosynthesis. Results will be discussed in terms of what longleaf pine sources might be deployed in VA the context of climate change.