POSTER SESSION

RESPONSE OF OUTPLANTED NORTHERN RED OAK SEEDLINGS UNDER TWO SILVICULTURAL PRESCRIPTIONS IN NORTH ALABAMA

Callie Jo Schweitzer
USDA Forest Service, Southern Research Station
Normal, Alabama 35762
Emile Gardiner
USDA Forest Service, Southern Research Station
Center for Bottomland Hardwood Research
Stoneville, Mississippi 38776
and
Stephanie Love and **Tom Green**
Alabama A&M University
Normal, Alabama 35762

The decision to artificially regenerate oak must be predicated on some basis. After completing an assessment of the potential to regenerate oak naturally, we decided our stands might benefit from supplemental oak plantings. The primary objective of this study was to couple outplanting of northern red oak (*Quercus rubra* L.) with applied silviculture prescriptions in north Alabama. Outplanting light conditions were quantified and seedling survival, growth, and photosynthetic light response curves were developed.

In 2002, northern red oak seedlings were grown from acorns under full ambient (sun) and half-ambient (shade) light conditions in a greenhouse. Seedlings grown under full sun conditions were significantly taller, had more leaves, and more flushes per seedling compared to those seedlings grown in shade. There was no significant difference in root collar diameter. Seedlings were hand-planted in the field in February of 2003. Seedlings from each greenhouse light condition were planted either in a clearcut or under an oak shelterwood.

There were three replicates of each outplanted stand. The oak shelterwood was created in November 2002 by using an herbicide to selectively remove mid-canopy species; no gaps were created in the overstory canopy. The clearcut was harvested in winter 2002. The clearcut had 5 ft^2/acre residual basal area, 32 percent canopy cover, and 69 percent of photosynthetic active radiation (PAR) compared to above canopy levels. Residual basal area for the oak shelterwood was 70 ft^2/acre, 98 percent canopy cover, and 14 percent of PAR compared to above canopy levels. Competition was mechanically controlled and the outplanting sites were fenced.

Survival was high for all outplanted seedlings. Seedlings grown under full ambient light (sun seedlings) and outplanted in the clearcut had greater basal diameter growth than both sun and shade seedlings outplanted in the shelterwood. Previous exposure to higher ambient light levels (sun seedlings) did not result in greater light use for outplanted seedlings the following growing season. Outplanting light conditions affected physiological response, as net photosynthetic rate was greater for seedlings outplanted in clearcut compared to shelterwood conditions. Light saturation and light compensation point were significantly less for shelterwood seedlings compared to those in clearcut. Ambient light intensity (125 umol/m^2/s) under the shelterwood was, on average, below the light saturation level (151 umol/m^2/s).