Planting Oaks in Group Selection Openings on Upland Sites: Two Case Studies from Arkansas

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ABSTRACT: Two upland sites in Arkansas were studied to test the performance at 1-0 northern red oak (*Quercus rubra* L.) and white oak (*Quercus alba* L.) seedlings planted in group selection openings. Both red and while oak seedlings were planted at one location in the Ozark Mountains, and only red oak seedlings were plowed at a second site along Crowleys Ridge. Holes were dug with power augers and seedlings were planted by hand. At the time of planting, the mean height of red oak and white oak seedlings at the Ozark site were 3.4 and 1.9 ft. respective/y. Red oak seedlings at Crowleys Ridge averaged 3.0 ft tall when planted. After 4 years at the Ozark site 77% of red oak and 86% of white oak were alive. After 3 vears at Crowleys Ridge, red oak survival was 80%. Seedlings at both sites grew slowly. Mean 4-year height increment at the 0zark site was 2.1 ft for red oak and 2.5 ft for white oak, and mean 3-year height increment for red oak at Crowleys Ridge was 1.6 ft. Three years after planting in the Ozark Mountains and 2 years after planting at Crowley's Ridge, naturally regenerating competition had suppressed over one-third of the red oak and about one-half of the white oak. This necessitated a release treatment around planted seedlings at both sites. Oaks that decreased in total height over a given growing season were common. Most seedlings that decreased in height had been pulled over or crushed by other vegetation or exhibited top dieback.

Key Words: Northern red oak, planting, power augers, seedlings, white oak.

For decades, Forest managers have had difficulty in successfully regenerating upland oak stands. A common cause of oak regeneration failures is an insufficient amount of tall oak advance reproduction at the time of regeneration harvest, The development of this advance reproduction is hindered. in large part. by competition from shade tolerant. nonoak species in the midstory and understory (Ahrams 1992. Lorimer 1993, Lorimer et al 1994). A variety of silvicultural treatments, including harvesting, herbicides, and/or prescribed burning, have been used to reduce nonoak competition and encourage the recruitment of oak seedlings and saplings (Loftin 1990. Brose el al. 1999, van Lear 2004).

An alternative strategy for maintaining an oak component in difficult to regenerate stands is to plant oak seedlings. Oaks are planted either in clearcuts (Wendel 1980. McGee and Loll 1986) or beneath medium-den-