PRELIMINARY ANALYSIS OF NORTHERN RED OAK PROGENY TRIALS AT HTIRC

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Forest landowners in the Central Hardwood Forest Region value northern red oak (*Quercus rubra* L.) as a timber, wildlife, and restoration species. In addition, northern red oak grows well across a wide range of sites, which provides prospective tree planters with considerable flexibility. The Hardwood Tree Improvement and Regeneration Center (HTIRC) has a large collection of source-identified red oak families originating from collections made in the mid 1980's by the Indiana Department of Natural Resources (IDNR). By the mid 2000's, 21 progeny tests derived from these selected red oaks had been planted in Indiana and neighboring states. Here we describe the evaluation of HTIRC northern red oak progeny tests at least 10-years-old growing at three sites. These were measured or rated for height, dbh, volume, and stem quality. Tree performance was also compared to a check seedlot that represented average red oak in Indiana. Stem quality was evaluated as: presence of clear 12 ft log, number of branches greater than 1 inch on the bottom log (12 ft), presence/absence of sweep, overall branch angle (trees with strongly upswept limbs are downgraded). Because of pronounced differences in growth across the three sites, each test site was independently analyzed. Individual tree heritability estimates for volume ranged from 0.15 to 0.44. Heritability estimates for stem quality traits, including branch angle, sweep, and branchiness, were extremely high, so we expect selection for these traits will be highly effective. Improvement for volume and other traits was calculated relative to the checklot. Twenty trees with the greatest genetic potential were identified at each site. The average improvement of these 20 selections for volume ranged from 32-66% (depending on site), in comparison to the checklot. The trees selected for improved volume also showed 3 – 12% improvements in stem quality, depending upon which quality trait was examined.