

CHARACTERISTICS OF NORTHERN RED OAK SEEDLINGS GROWN BY FAMILY IN A TENNESSEE NURSERY

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Abstract—Thirty-eight northern red oak (*Quercus rubra* L.) families were grown for 1 year in a commercial tree nursery in eastern Tennessee, and analyzed for first-order lateral root, height, diameter, and flush growth. Growth was negatively impacted by irregular fertilization and irrigation practices as well as heavy rains during the growing season. Average height and diameter growth were smaller than previously published standards for minimum oak planting stock size of 50 cm in height and 8 mm in root collar diameter (RCD). Provenance effects on nursery seedling growth were nonsignificant for progeny that was one generation removed from the original seed source, except for number of flushes during the growing season. Progeny from related mother trees, i.e., half-siblings, generally did not exhibit similar growth performance.

Among-family differences in seedling growth suggests that nurseries should identify superior seed sources by evaluating the performance of progeny in the nursery. Root collar diameter was the best indicator of both height and number of first-order lateral roots (FOLR). Certain families had relatively high distributions of seedlings with above average RCD growth and low within-family variation in RCD. These results indicate that family mean should not be the sole criterion for selection of superior families. Additional nursery evaluations will identify mother trees consistently producing progeny with low numbers of FOLR, small heights, and small RCDs. These trees should be deleted from future seed collections or rogued, if in a seed orchard.

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