EVALUATING FLOOD TOLERANCE MEASURES FOR MISSOURI OAK SPECIES

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ABSTRACT

The aim of this research was to determine the effects of four flooding treatments on survival of seedlings from 45 seedlots of seven oak species at two sampling dates using logistic analysis, and to quantify growth responses to flooding of seedlings from 27 seedlots of swamp white oak (*Quercus bicolor*). Flooding treatments were initiated at the completion of the first growth flush. Significant species and flood treatment differences were detected at the end of the growing season (15 week post-flood) and again in the following year (45 weeks post-flood). Logistic analysis demonstrated that *Q. bicolor* was the most flood tolerant species, followed by *Q. palustris* and *Q. macrocarpa*. Seedlings of *Q. shumardii*, *Q. rubra*, *Q. alba* and *Q. muehelenbergii* were less flood tolerant based on survival odds ratios at 45 weeks post-flood.

Genetic differences in growth responses to flooding were detected among 27 seedling families of swamp white oak. No significant gains in flood tolerance were achieved using acorns derived from specific seed sources (or stands) along a hydrologic gradient. Flood tolerant swamp white oak families were identified in the "recovery" year following flooding by a flood tolerance index, which integrated four growth response variables. Of these four variables, the total number of elongating shoots and total leaf number after an over wintering flush were most highly correlated with flood tolerance.