

MAACKIA AND MORE: RESEARCH ON WOODY ORNAMENTALS AT IOWA STATE UNIVERSITY

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Elevated root-zone temperatures, infertile soils, and water stresses are among the factors contributing to the decline of urban trees. We have been evaluating tree species for their responses to heat and drought stress. In addition, we are investigating the growth rate, ornamental characteristics, and efficiency at fixing nitrogen of seedlings of *Maackia amurensis* (Amur maackia). Studies in the field are designed to determine how the use of in-ground containers and tree shelters influences the production of five under-used species.

A potentially attractive and hardy addition to the urban landscape, Amur maackia is scarcely available commercially and has received little attention from researchers. Because it can fix nitrogen, Amur maackia is considered a good candidate for use in poor-quality soils, but we have limited information about genetic variability in this species. We have examined the variation in nodulation and nitrogen fixation among seedlings from 38 seed sources and have investigated the need for nitrogen during nursery production of plants inoculated with compatible rhizobia. In additional studies with the University of Minnesota, we found genotypic variation in the rooting of stem cuttings from 20 trees of this species.

Several members of the genus *Acer* have been evaluated for their responses to drought and root-zone heat stress. Seedlings of *Acer nigrum* (black maple) were found to have a greater proportion of their biomass partitioned to the root system than seedlings of *A. saccharum* (sugar maple), and leaves of black maple had a greater specific mass. These traits suggest that black maple is more resistant to drought than sugar maple. We also are examining the heat and drought resistance of red, silver, and Freeman maples in cooperation with the USDA-ARS National Arboretum. Cultivars of red maples have been shown to vary in heat resistance.

A study was initiated earlier this year to determine how certain trees would respond to production in in-ground plastic containers with and without tree shelters. Growth of treated trees is being compared to growth of trees produced in traditional ways. *Acer buergerianum* (trident maple), *Cercidiphyllum japonicum* (katsura tree), *Corylus colurna* (Turkish filbert), *Maackia amurensis* (Amur maackia), and *Sorbus alnifolia* (Korean mountain ash) are included in this study.