

**Monitoring of Black Walnut Populations in the eastern United States.** Denita Hadžiabdić Guerry<sup>1</sup>, Jennifer Franklin<sup>2</sup>, Robert Trigiano<sup>1</sup> and Mark Windham<sup>1</sup>. <sup>1</sup>Department of Entomology and Plant Pathology and <sup>2</sup>Department of Forestry, Wildlife and Fisheries. University of Tennessee, Knoxville, TN. 37996.

We plan to determine the present status of genetic diversity among infected vs. non-infected populations of black walnuts. The project will directly compare black walnut populations in disturbed and undisturbed areas (diseased vs. healthy trees) to understand origin and maintenance of genetic variation for future monitoring of species decline. In order to provide better understanding regarding disease progress, timing and infestation predictions, our group plans to identify relationships between the rate of tree decline, the change in intensity of tree injury over time, and the relationship between the rate of tree decline and local climatic factors. We will be using analysis of annual diameter growth and examining non-structural carbohydrate (sugar and starch) levels, electrolyte leakage, and fine:coarse root ratios of healthy and diseased walnut trees.

**Epidemiological Studies of Thousand Cankers Disease.** Mark Windham, Denita Hadžiabdić Guerry, Paris Lambdin and Jerome Grant. University of Tennessee, Knoxville, TN. 37996-4560.

Populations of walnut twig beetles are being segregated by sex and examined for conidia of *Geosmithia morbida* to determine if female beetles carry more conidia since they have more setae on their bodies than do male beetles. Studies are planned for 2012 to determine how long conidia of *G. morbida* can remain viable on the beetles and how long conidia can survive in direct daylight and varying degrees of shade.

Sixteen previously developed polymorphic microsatellite loci from *G. morbida* will be used to assess pathogen population structure and genetic diversity in every state in the eastern U.S. that becomes positive for Thousand Cankers Disease. Samples of collected isolates will be tested for differences in virulence and hardiness to environmental factors.

Two populations of trees with symptoms of TCD (those confirmed to have infections by *G. morbida* and to be infested with walnut twig beetles and those that were negative for the fungus and insect) have been identified. Symptoms associated with both groups will be compared to determine if specific symptoms for TCD can be ascertained so that trees suffering from drought stress or other problems can be separated from trees with TCD based on symptoms.

The ability of other walnut-inhabiting insects to carry and deposit viable conidia of *G. morbida* also will be investigated. Insects will be collected from walnut samples and processed for conidia; rinsates will be collected and placed on media to determine presence of *G. morbida*. Another beetle, *P. lautus*, will be collected and evaluated for its ability to transport and deposit viable conidia.

**Distribution of TCD.** Jerome Grant, Mark Windham, Paris Lambdin, and Greg Wiggins. We plan to continue studies to determine the distribution of walnut twig beetle, *G. morbida*, and symptomatic trees in Tennessee. Efforts will be maximized to assess the incidence of TCD in forest settings.