



Walnut Twig Beetle and Thousand Cankers Disease Expand Foothold in Eastern U.S.A.

Last year (2010) the walnut twig beetle (WTB) was discovered in Knox County, Tennessee (<http://news.tennesseeanytimer.org/node/5684>, [MFC Forest Health Note #35](#)). WTB is associated with a newly described fungus (*Geosmithia morbida*) that infects and kills the phloem tissue of walnut (*Juglans* spp.) branches and stems. The fungus causes characteristic dark colored lesions under the bark (Fig. 1), which eventually leads to the formation of oozing bark cankers. [According to the Virginia Department of Agriculture and Consumer Services](#), "...On June 24, 2011, TCD was found in two black walnut trees in Chesterfield County, Virginia...The Virginia Department of Agriculture and Consumer Services (VDACS) is currently surveying the area to determine the extent of the infestation. Initial survey work has discovered additional walnut trees infested with TCD in both Chesterfield and Henrico counties...". In response, [VDACS established a temporary quarantine](#) prohibiting movement of "...all walnut plants and plant parts, including logs, stumps, firewood, roots, branches, mulch and chips out of the quarantined area...". The WTB, *Pityophthorus juglandis* Blackman, is native to

the southwestern United States (CA, AZ, and NM) and Mexico. Widespread ornamental plantings of eastern black walnut in the western U.S. have provided new hosts for the WTB, and have permitted a range expansion of the beetle into additional western states (OR, ID, UT, CO). WTB was previously not known to occur in the eastern United States, as the Rocky Mountains and Great Plains regions provided a barrier to the beetles. Historically, this tiny beetle was not considered a pest of walnut trees, and was often overlooked due to its size and its behavior of colonizing branches. However, this changed after WTB was recently found to carry the pathogenic fungus that causes thousand cankers disease. The area affected by the fungus is localized around each beetle attack (Fig. 1). The fungus does not move systemically in the plant as do some other insect-carried fungi, such as the pathogens that cause Dutch elm disease (*Ophiostoma novo-ulmi*) or laurel wilt disease (*Raffaelea lauricola*). Instead, tree death results from damage to phloem tissue that transports nutrients throughout the tree. WTB will eventually create many feeding and reproductive galleries and subsequent fungal cankers can

coalesce, effectively girdling effected branches and stems. Initial symptoms of thousand cankers disease usually include yellowing of foliage and thinning of the upper crown (Fig. 2). As the disease progresses, the dieback of progressively larger branches occurs. Up close, surfaces of affected walnut branches and stems will exhibit pinhole-sized WTB entrance or emergence holes and staining of the underlying phloem tissue (Fig. 3). The bark above these cankers often oozes a dark liquid. Larval galleries are excavated perpendicular to the grain between the outer bark and surface of the heartwood. The length of time the disease needs to kill infected trees is not known, although tree vigor seems to slow down the progression. Maintaining proper tree vigor should be the landowner's first defense. Research is underway to identify an effective chemical control strategy. The most promising method involves trunk injections of both systemic insecticides and fungicides, but the reliability of this method for WTB/TCD is still being studied. Cultural control can be accomplished by cutting and immediately chipping and or burning infested trees to destroy beetles and fungi.

Many experts currently studying WTB/TCD believe that the disease is likely present but undetected in many areas in the eastern U.S. where black walnuts are present. Residents and professionals living or working in areas of Mississippi with higher densities of black walnut (such as extreme north-east Mississippi) are urged to pay attention to walnut trees exhibiting the symptoms of TCD and report any such occurrences to Dr. John Riggins, Forest Entomologist at Mississippi State University. **It is also critically important to NOT move any walnut plants or plant parts, especially firewood, into the state of Mississippi.**

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Figure 1: Fungal lesions in phloem tissue of black walnut (*Juglans nigra*). Photo Courtesy of Ned Tisserat, Colorado State University, Bugwood.org.



Figure 2: Canopy dieback and epicormic branching of black walnut (*Juglans nigra*), symptoms of thousand cankers disease. Photo Courtesy of Whitney Cranshaw, Colorado State University, Bugwood.org.



Figure 3: Adult Walnut Twig Beetle (*Pityophthorus juglandis*) attack holes on Southern California walnut (*Juglans californica*). Photo Courtesy of Whitney Cranshaw, Colorado State University, Bugwood.org.