



Thousand Cankers Disease: *Indiana Walnut Trees Threatened*

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Introduction

Since it was first recognized in 2008, thousand cankers disease (TCD) has caused the widespread death of black walnut trees (*Juglans nigra*) throughout the western United States. TCD has been detected in six states within the native range of black walnut, including Tennessee, North Carolina, Virginia, Maryland, Pennsylvania, and Ohio.

The fungus and the beetle that cause TCD have been detected in Indiana — but TCD has not been detected in any standing walnut trees in Indiana. All walnut tree species (*Juglans* spp.) are susceptible to TCD, but black walnut appears to be the most susceptible.

Black walnut is among the most productive timber trees in Indiana and plays a valuable ecological role in urban landscapes and native forests. Indiana ranks third in U.S. walnut timber production. For these reasons, it is important to protect walnut trees in Indiana.

This publication describes TCD and Indiana's walnut product quarantine.

The Disease Complex

The TCD complex is caused by the fungus *Geosmithia morbida* (Gm), which is vectored by the walnut twig beetle (WTB, *Pityophthorus juglandis*). WTB is a tiny, reddish brown beetle that is about the size of a mustard seed (1-2 mm long) and is native to the southwest United States (Figure 1). When the beetle burrows into a walnut tree to feed and reproduce, it deposits the fungus in the tree, which infects the tree tissue.

Photo provided by Steven Valley, Oregon Department of Agriculture, Bugwood.org.



Photo provided by David L. Clement, University of Maryland

Figure 1. (Left) The walnut twig beetle is the vector of *Geosmithia morbida*, the fungus that causes thousand cankers disease. The beetle is about the size of a cat flea (top right).

Symptoms

The Gm fungus (which gets deposited by a feeding WTB) destroys a tree's vascular tissue. Small, dark-colored, fungal-induced lesions (called cankers) form where adult WTB enter the tree to mate (Figure 2). Eventually, the cankers expand and merge, which kills the phloem and prevents the flow of vital nutrients throughout the tree (Figure 3).

Thousands of beetles may attack a single tree at one time, potentially delivering a lethal dose of the fungal pathogen. Trees infected with TCD exhibit symptoms of general decline, such as the presence of yellow, wilted leaves and dieback of branches in the crown (Figure 5).

Site and environmental stress factors (such as extreme temperature or moisture) can cause similar decline symptoms, which complicates TCD detection. After symptoms first appear, a tree often succumbs to TCD in three to five years. Identifying TCD before signs of tree decline appear is difficult.

Situation in Indiana

In June 2014, the Gm fungus was detected on three individual adult *Stenomimus pallidus* weevils that emerged from two girdled study trees in Brown County, Indiana. It is not clear whether these weevils contribute to spread of TCD but monitoring efforts are ongoing. In 2015, adult WTBs were captured in traps and reared from the bark of logs from a sawmill in southeast Franklin County, Indiana. The Gm fungus was detected on these beetles.

TCD has *not* been detected in any standing walnut trees in Indiana, and state surveys have not identified any cankered trees. TCD is not currently killing walnut trees in Indiana and has not spread rapidly in other Eastern states where it has been found, so there is now less concern about widespread walnut decline due to TCD than a few years ago.

However, because TCD has a high potential for damage, several states (including Indiana) have taken the precaution of issuing quarantines to regulate the movement of potentially infested wood to help protect black walnut from the disease.

Transporting Walnut Materials into Indiana

Under Indiana's TCD quarantine, regulated walnut materials that originate in, or move through, a quarantined state are prohibited from being brought into Indiana.



Photo provided by Ned Tisserat, Colorado State University, Bugwood.org.

Figure 2. A TCD canker under the bark of a black walnut branch.



Photo provided by Ned Tisserat, Colorado State University, Bugwood.org.

Figure 3. TCD cankers eventually coalesce, which girdles the branch.



Photo provided by Whitney Cranshaw, Colorado State University, Bugwood.org.

Figure 4. After feeding, WTBs create tiny exit holes in the bark.

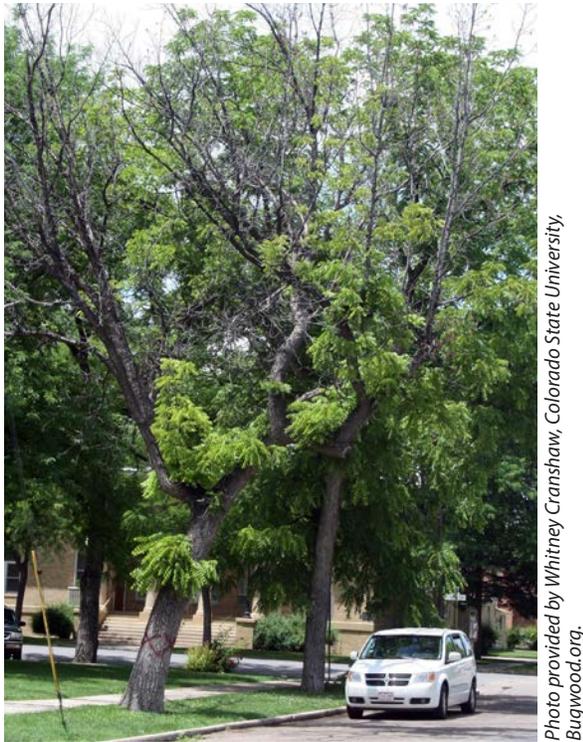


Figure 5. Trees infected with TCD exhibit symptoms of general decline.

Materials prohibited by the quarantine include:

- All types of hardwood firewood
- Walnut logs, lumber, chips, and mulch
- Walnut nursery stock, budwood, and scion wood
- The fungus *Geosmithia morbida*
- The walnut twig beetle (*Pityophthorus juglandis*)

Walnut items exempt from the quarantine include:

- Nuts, nut meats, and hulls
- Kiln-dried lumber that has 100 percent squared edges and is 100 percent bark-free
- Finished wood products without bark attached, such as furniture, instruments, and gun stocks

Individuals or businesses who want to bring regulated articles into Indiana should:

- Obtain a state-issued phytosanitary certificate that indicates the article’s county of origin and verifies that the items are free of TCD

- Notify the Indiana Department of Natural Resources (IDNR) at least 24 hours before they transport any items into Indiana (call 317-232-4120 or visit www.in.gov/dnr/entomolo/2899.htm for details)
- Obtain a compliance agreement issued by the IDNR
- Have the shipment inspected once it arrives in Indiana

Transporting Walnut Materials Out of Indiana

Other states have restricted the movement of Indiana walnut materials into or through their states. These restrictions vary from state to state, so contact an IDNR Compliance Officer for more information or to obtain a compliance agreement or state phytosanitary certificate.

To contact an IDNR Compliance Officer, visit www.in.gov/dnr/entomolo/2899.htm.

Find Out More

Learn the latest about TCD, including state-specific information:

www.thousandcankers.com

Read the entire IDNR quarantine document and find updated information about TCD in Indiana:

www.in.gov/dnr/entomolo/6249.htm

Reporting Suspected TCD in Indiana

If you see symptoms of TCD in Indiana, report it. There are two ways to report a suspected TCD infestation.

- Use the Great Lakes Early Detection Network app (available for [Android](#) and [iPhone](#) devices).
- Notify the IDNR Division of Entomology and Plant Pathology
866-NO EXOTIC (866-663-9684)

depp@dnr.in.gov

Please include your contact information, a description of the symptoms you have observed, and the location of the suspected infected tree.

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