

THOUSAND CANKERS DISEASE

[*Pityophthorus juglandis* Blackman]
[*Geosmithia* sp.]



Fig. 1

UGA 5406088

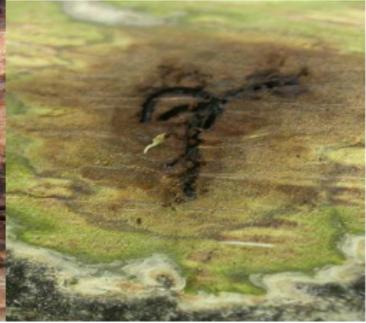


Fig. 2

UGA 5406094

Problem: Thousand Cankers Disease (TCD) (Figs. 1 and 2) is a pest complex that is causing widespread mortality in primarily black walnut (*Juglans nigra* L.) in many western states, and most recently, Tennessee.^{1,4,5,7} It is caused by an unnamed fungus of the genus *Geosmithia* that is vectored into the tree by the walnut twig beetle (WTB) (*Pityophthorus juglandis* Blackman); a bark beetle native to North America (Arizona, New Mexico, California, and certain areas of Mexico).^{1,2,3} The common name for this disease is derived from the coalescing cankers surrounding multiple beetle entry points on twigs, branches, and main stems.^{1,3,7}

Identification: Adult WTB are very small, 1½ to 2 mm (~ 1/16 in) long, and are reddish-brown in color (Figs. 3 and 4).^{3,7} WTB prefers to colonize branches greater than 1½ cm (~5/8 in) in diameter and will also colonize the main stem.^{2,7} Larvae are white, c-shaped and found in the phloem.³ WTB is the only *Pityophthorus* species associated with walnut, but can be distinguished from other members of the genus by 4 to 6 concentric rows of ridges (asperities) on the upper surface of the pronotum (shield-like cover behind and over the head) (Fig. 4).^{3,7} Aside from causing cankers that rarely show external symptoms,⁵ *Geosmithia* fungus is inconspicuous and must be cultured on agar to confirm identity.³



Figs. 3 and 4

Jim LaBonte

THOUSAND CANKERS DISEASE

Pityophthorus juglandis Blackman

Geosmithia sp.



Fig. 5 UGA 5406047



Fig. 6 UGA 5406045

Signs and Symptoms: Early symptoms include thinning foliage and yellowing of leaves in the upper crown (Fig. 5).^{1,5} As the disease progresses, larger, dead limbs may exhibit dieback and leaf flagging (Fig. 6).^{1,5}

Visually surveying for dieback is the best tool to detect TCD.³ Numerous small circular to oblong cankers form in the phloem under the bark, which eventually kill the cambium (Fig. 1). The bark may not exhibit symptoms, but can crack and become dark and stained above a canker.^{1,5} Tiny WTB entrance and exit holes are usually visible on dead

and dying branches (Fig. 7) and galleries, generally 2½ to 5 cm (1 to 2 in) long, are often found within the cankers (Fig. 2).^{1,3,7}

Similar Species: Most canker producing fungi that

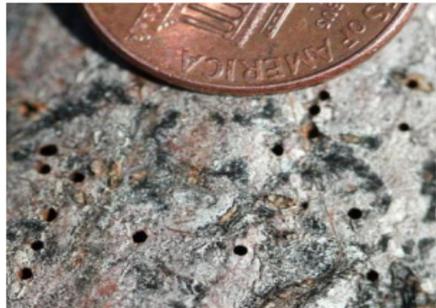


Fig. 7 UGA 5406073

affect walnut trees show external symptoms. TCD cankers rarely exhibit external symptoms.⁵ Anthracnose causes rapid leaf drop, while TCD-killed leaves remain attached to branches. Fusarium cankers are visible without removing bark and often begin formation at the base of the tree.⁶ Crown dieback and defoliation can also be caused by many abiotic factors such as drought, ice damage, and poor site conditions.⁶