UTAH PESTS fact sheet

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Thousand Cankers Disease of Walnut
(*Geosmithia morbida*)

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What you should know

- Thousand cankers disease is caused by the fungus *Geosmithia morbida*.
- It is transmitted by the walnut twig beetle (*Pityophthorus juglandis*).
- Once symptoms are visible, trees can die within 2 to 3 years.

INTRODUCTION

Thousand cankers is a newly recognized disease of walnuts, caused by a fungus (*Geosmithia morbida*) that is spread by the walnut twig beetle (*Pityophthorus juglandis*, Fig. 1). The beetle is endemic to the native range of Arizona walnut (Arizona, New Mexico, and Chihuahua, Mexico), and was first identified in Utah in 1988. Widespread mortality of black walnut in the early 2000s in Colorado and Utah led to the discovery of the pathogen-vector complex. The name of the disease comes from the numerous necrotic lesions (cankers, Figs. 4a and b) found on the cambium of infected trees (Tisserat et al. 2009). The fungus kills black walnut trees (Fig. 2) often within 3 years of the development of the first symptoms (Cranshaw and Tisserat 2008).

HOSTS

Black walnut (*Juglans nigra*) and black walnut hybrids are very susceptible to *Geosmithia*. California walnuts (*J. hindsii, J. californica*) and Persian walnuts (*J. regia*) are slightly susceptible. Cankers do not seem to form on Arizona walnuts (*J. major*) (Cranshaw and Tisserat 2008).

SYMPTOMS

It may take several years of insect and fungal attack before symptoms are visible, starting with yellowing leaves and thinning tree crown. As the disease progresses, foliage wilts, larger branches die, and eventually the tree dies (Fig. 2) (Tisserat et al. 2009). Minute exit holes caused by the twig beetle can be found on the trunk (Fig. 3).



Fig. 1. Walnut twig beetle (*Pityophthorus juglandis*)[1]



Fig. 2. 400-year old black walnut killed in northern Utah



Fig. 3. Exit holes caused by the walnut twig beetle

VECTOR

The walnut twig beetle (*Pityophthorus juglandis*) (Fig. 1) is a minute beetle (size of a grain of rice). Its life cycle is not fully understood, but it is believed in Colorado to have two or more generations (Cranshaw and Tiseratt 2008). Adult beetles fly from April through October to black walnut, lay eggs on large limbs and tree trunks rather than on small twigs as the name implies. Larvae then tunnel into the cambium where they feed until pupation. Emerging adults carry fungal spores of *Geosmithia* to other trees (Tisserat et al. 2009).

DISEASE CYCLE

The walnut twig beetle carries and deposits the fungus in the galleries it creates in the cambium of the host tree. *Geosmithia* then colonizes and kills the cambium and phloem tissue surrounding the gallery. Cankers form around every twig beetle feeding site, resulting in thousands of small cankers that coalesce to several large ones, which eventually leads to tree death.

MANAGEMENT

Once the fungus has colonized the host tissue, it will continue to grow, and systemic and contact insecticides targeting the beetle do not prevent progress of the disease (Frank and Bambara 2010). The best management strategy in Utah is to prevent introduction of the beetle and the fungus to areas where it does not already occur through early detection and destruction of infested trees (Frank and Bambara 2010).



Figs. 4 a and b. Canker symptoms surrounding beetle galleries shown on the surface of the trunk (top) and just under the bark (bottom).

REFERENCES AND ADDITIONAL SOURCES

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Tisserat, N., Cranshaw, W., Leatherman, D., Utley, C., and Alexander, K. 2009. Black walnut mortality in Colorado caused by the walnut twig beetle and Thousand cankers disease. Plant Health Progress. http://www.plantmanagementnetwork.org/pub/php/research/2009/walnut/

Image credits

[1]Whitney Cranshaw, Colorado State University, bugwood.org

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