

Walnut Council

Maryland Chapter Newsletter

Fall 2010

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Thousand Cankers Disease Found in the Native Range of Black Walnut

The following article was written by Lenny Farlee, Extension Forestry Specialist for the Perdue University Extension, and originally published in the Hardwood Tree Improvement and Regeneration Center E-Newsletter (Vol. 3, Issue 2):

Thousand Cankers Disease (TCD) is a disease currently killing black walnut trees in the western United States. This disease was thought to be found only in the western U.S., outside of the native range of black walnut, until black walnut trees infected with TCD were found near Knoxville, Tennessee in July, 2010. Early indications suggest the disease has been in Tennessee for several years and has infected and killed walnuts in urban areas in the Knoxville area and surrounding counties. It is not yet known if black walnuts in woodland environments have been infected. Now that TCD is known to infect and kill trees in the native range of black walnut, controlling the spread of TCD and researching

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ways to protect the walnut resource in the eastern United States are important goals.

One important tool for managing this disease will be scouting and identification of infected trees. Familiarity with the biology and symptoms of TCD infection can help locate TCD outbreaks and enhance control efforts. Tiny Walnut Twig Beetles (figure 1) bore into stems and branches of walnut trees and carve out galleries beneath the bark, where mating and egg-laying occurs. The beetles carry on their bodies spores of the *Geosmithia* fungus, which form small cankers

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insert...

Walnut Council Fall Meeting Invitation and Registration Form

The Hydraulic Water Ram System

David Earle

The high heat and drought of 2010 motivated this writer to explore the possibility of crafting a water ram pump to irrigate a new plantation of 1400 saplings (mixed hardwoods). Two nearby streams gave me hope that I would be able to tap the force of falling water to drive a water ram to distribute water over a 7-acre area. For years I have saved notes and plans for building water rams, so now was the time to harness some of this free energy quietly flowing through our farm every day.

What is a water ram? To quote Rodale, "A hydraulic ram is a simple device invented in the early 19th century. It uses the power of falling water to force a small portion of the water to a height greater than the source." Unlike an old jet well pump I use in a larger nearby stream, the ram uses no electric power and consists of only two working parts. One design, from the Clemson University Cooperative Extension Service, consists of standard plumbing valves and fittings, costing only \$120.

In deciding what size pump to buy or build, some measurements are critical at the beginning. Water flow needs to be constant; vertical water fall to the pump must be a minimum of 18 inches; the drive pipe distance from the water source to the ram pump is relevant to its diameter and must be

as straight as possible; and the desired elevation for the water outlet must be known. Some sources suggest that typical ram pumps discharge about 7 gallons of water through the waste valve for every gallon pressurized and pumped.

My current Lehman's catalog shows an imported model for a little under \$500 that uses a one-inch intake, 1.5 to 4 gal/min of flow, and 3' to 20' of water fall to deliver up to 1700 gallons/day. The catalog reads, "pump water uphill as much as several hundred feet, using simple gravity and running water. Place Ram downhill from any constantly flowing water source (water must fall at least 3' through anchored, rigid pipe before it reaches intake). Water flows past check valve, enters pipe that slopes uphill to the discharge point, and continues upward until just past entry height. As water ebbs back to entry height, the check valve closes immediately, redirecting water into

Ram Pump (Continued on page 5)



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(figure 2) under the bark on the phloem. Huge numbers of beetles, and subsequent cankers, may infest branches. As the cankers gradually grow together, the branches are girdled and the foliage begins to yellow and wilt (figure 3). The tree is normally dead within 2 to 3 years of the first signs of foliage yellowing and wilting.

Some signs of TCD infection are:

- Yellowing, followed by wilting and browning of foliage during the growing season. The wilted leaves may remain attached to the twigs. This initially may be limited to scattered limbs in the tree crown, resulting in limb dieback. Black walnut leaves normally yellow and drop early in the fall due to anthracnose and other leaf pests, but wilting does not normally occur.
- Tiny holes in branches, smaller than the diameter of a pencil lead, associated with beetle entrance and exit boring (figure 4).
- Numerous circular or oblong cankers located under the inner bark on the phloem of branches. Gently scraping off the bark will reveal these cankers – they do not extend into the wood.
- The galleries created by the walnut twig beetle will normally be associated with the cankers.
- Additional information is available on the Colorado State University Thousand Cankers Disease and Walnut Twig Beetle website, at <http://www.colostate.edu/Dept/bspm>.



Figure 1. Walnut Twig Beetle. Actual size is 1.5 to 2 mm.
Photo by Jim LaBonte, Oregon Department of Agriculture.

If you see walnut trees demonstrating these symptoms, contact your state forestry agency or local Cooperative Extension Office for assistance with confirmation of infection.

TCD poses a very serious threat to the walnut resource in North America. Black walnut has historically been the most valuable eastern hardwood veneer and lumber species, and represents millions of dollars of value in standing timber and industry production based on the

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Figure 2. Twig beetle galleries and *Geosmithia* cankers.
Photo by Whitney Cranshaw, Colorado State University.

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resource. To address this threat, many states in the native range of black walnut have imposed quarantines preventing the movement of materials that might carry TCD from infected to uninfected areas. As individuals, we can help in this effort by not moving hardwood firewood, walnut bark, lumber, or craft wood, or walnut trees, seedlings, or plant parts. TCD is not believed to be found in walnut nuts. Kiln-dried, bark-free, square-edged walnut lumber may be moved, but must receive certification for transport if traveling from or through quarantined areas.



Figure 3. Leaf yellowing, wilting and branch dieback
Photo from Ned Tisserat, Colorado State University.

The other important action for owners of walnuts to take is not to jump into a decision to sell or cut down the walnuts on your property. The geographic extent, rate of spread, and activity of this disease on native forest-grown walnuts in the east is not yet known. There might be undiscovered natural resistance to TCD in the native walnut population. Consult with a qualified and trusted professional forester or certified arborist before making any decisions to market or remove walnut due to concerns about TCD.

Two western walnuts, Arizona walnut and Little or Texas walnut, appear to be unaffected by TCD and may be a source of resistance that could be bred into the eastern black walnut. The Hardwood Tree Improvement and Regeneration Center is currently cooperating with several other organizations on TCD research. HTIRC has started experimental crossing of Arizona and Black

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Got E-mail?

Occasionally we have timely information to share with you. If you have an e-mail account, but have not received any e-mails from us this summer, that means we don't have your current address. If you would like to be included in the e-mail news list, please send an e-mail to David Robbins at: [drobbins@dnr.state.md.us](mailto:d Robbins@dnr.state.md.us).

We promise not to clutter your inbox!

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Figure 4. Exit holes made by adult walnut twig beetles
Photo by Whitney Cranshaw, Colorado State University.

Walnut to investigate the potential for breeding resistance to TCD into eastern black walnut. In addition, HTIRC has plantings of several families of black walnut in the western U.S and Tennessee that may serve as screening sites for family differences in resistance to TCD.

For additional information on TCD, refer to the following sites:

U.S. Forest Service Pest Alert –

http://na.fs.fed.us/pubs/palerts/cankers_disease/thousand_cankers_disease_low_res.pdf

Purdue University TCD information -

<http://www.ppdL.purdue.edu/PPDL/hot10/8-23.html>

The Walnut Council TCD information -

http://www.walnutcouncil.org/thousand_cankers_disease.htm



Ram Pump (Continued from page 2)

securely anchored ram air piston. Air trapped in piston compresses and springs back, forcing water farther uphill toward discharge. A momentary vacuum results, allowing more water past check valve. Incoming water flows uphill until just past entry height, and the process repeats itself. Lasts for decades with little maintenance.”

I have yet to finish my project, but prefer to try building the all-PVC Clemson device. I have lain several hundred feet of 1-inch plastic pipe in the smaller stream which is fed by springs and a pond on an adjoining farm. That pipe’s inlet is about 3’ above the outfall into my seasonal pond and is adjacent to the new tree plantation. The measured water flow is 2.5 gal/min. Without any pump, I have extended this water another 100’ (into the tree plantation) and gravity, plus water pressure, is still on my side in the test. A ram pump will aid considerably in the distribution and since it is virtually all horizontal, I should be able to feed several drip irrigation feeds at once. There is some more work to be done on the stream catchment basin and small rock dam.

Anyone interested in building a ram pump can contact me at 410-489-7948, and I will be happy to share my resource information and the lessons I have learned thus far.

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Upcoming Events:

November 2 – Registration deadline for the Walnut Council Fall Meeting (see insert)

November 5 & 6 – Maryland Forest Association Annual Conference—“Maryland’s Working Woodlands”, Gaylord National Resort, near Washington, DC. For more information, visit: <http://mdforests.org/AM2010.html>

November 9 – Walnut Council Fall Meeting, Braddock Inn, Braddock Heights, MD (Frederick Co.)

November 11 – University of MD Cooperative Extension Webinar on “Forest Threats”, from noon to 1:00 pm. For more information, visit: <http://naturalresources.umd.edu/>

November 16 – University of MD Cooperative Extension “Handheld GPS Beginner Workshop”, College Park, MD. For more information, visit: <http://naturalresources.umd.edu/>

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