

HARDWOOD TREE IMPROVEMENT & REGENERATION CENTER E-NEWSLETTER - November 2013

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Thousand Cankers Disease of Black Walnut Confirmed in Ohio

Thousand cankers disease of black walnut was confirmed in Butler County, Ohio in August, 2013. Butler County lies directly north of Cincinnati. Thousand cankers disease (TCD) has been found previously in several western states, as well as Tennessee, Pennsylvania, Virginia and North Carolina. TCD is a disease of black walnut and other walnut species composed of a fungus in the *Geosmithia* genus that is carried into the inner bark of the tree by the tiny walnut twig beetle. The infestation of trees with thousands of twig beetles, followed by the growth of the cankers has resulted in the death of many black walnut in the locations mentioned. So far, infested trees in the eastern US have been found in urban and suburban areas and campgrounds in the North Carolina portion of the Great Smoky Mountains National Park.

To prevent the spread of TCD and other tree diseases, quarantines have been established controlling the movement of wood products. Landowners, woodworkers, forest and tree workers can help prevent the spread of TCD and other tree killing insects and diseases by not moving firewood and familiarizing themselves with the symptoms of TCD and quarantine limitations on movement of wood. Some of the TCD infestations in the eastern US are related to movement of walnut wood products from infested western states. For additional information on TCD, including what to look for, where TCD is currently found, and quarantines associated with TCD, please visit www.thousandcankers.com.

If you would like to hear about the research and survey work related to TCD, there are several webinars and articles you can link to from the thousandcankers.com website.

The Annual Conference on Thousand Cankers Disease and Emerald Ash Borer in the Eastern United States is being held in Knoxville, TN, December 11-13, 2013. The website for additional information is <http://www.protectnforests.org/conference.html>.



Figure 1. Black walnut tree with thousand cankers disease.
(Photo by Karen Snover-Clift, Cornell University, Bugwood.org)



Figure 2. Cankers in the inner bark of a black walnut branch.
(Photo by Whitney Cranshaw, Colorado State University, www.forestryimages.org)

Seed Collection Time at HTIRC

By James McKenna, *Operational Tree Breeder*

Lenny Farlee, *Extension Forestry Specialist*

Brian Beheler, *Research Forester*

Fall brings a rush of activity to field operations at the HTIRC. As seed begins to fall in our orchards and test plantings, we must work rapidly to collect, clean and store the seed before rodents and other seed predators can pilfer the crop. Some species, like white oak, will start sending out a root soon after the seed hits the ground, so timing of collection is critical to retain seed viability for planting. We also take pains to keep the seed properly sorted and labeled to enable tracking individual lots through the operations involved in growing seedlings and out-planting in test plots. Seeds ripening and falling at this time of year include black walnut, butternut, red and white oaks, and chestnuts.

The fact that HTIRC is a partnership between the US Forest Service Northern Research Station, Purdue University Department of Forestry and Natural Resources, and many other groups, agencies and individuals provided an important advantage this year in particular. The Federal shutdown occurred during the peak of nut collection this fall. Fortunately, partnering staff and supporters from Purdue University Department of Forestry and Natural Resources and the Indiana Division of Forestry were able to collect seed while federal employees were furloughed, assuring we have materials to continue our tree improvement work for the coming year.

One of our long-term partners and cooperators has been a large part of our seedling production process from the beginning. The Indiana Department of Natural Resources Division of Forestry operates Vallonia State Tree Nursery in southern Indiana. Bob Hawkins, nursery manager, and his staff are experts at tree seedling production, and the sandy soils and infrastructure available at the nursery create the perfect environment for growing the best quality seedlings from seed. They have cooperated with the HTIRC for many years to provide seed bed planting space, care and maintenance, and harvesting assistance to help us continue our tree improvement work.

The process of collecting seed and planting it for seedling production is more complex and involved than one might think. Seed is collected from our orchards and experimental plantings to continue long-term tree breeding work, as well as to supply seed for seedling production from improved tree orchards. The seed must be collected and sorted according to parent trees, so we always know the genetic heritage of the seedlings as testing continues. Genetic tests will be done to be sure we have the correct offspring if in doubt, but these tests are expensive and time consuming, so good tracking and record keeping is the most efficient approach. Some trees produce seed with distinguishing physical characteristics like color or shape that can help with identification. In many cases, we will take a tractor mounted tree shaker or a pole to shake or knock down seed all at one time for efficient collection and assurance of parentage.

Once seed is collected, it needs to be processed and stored quickly and correctly to retain viability. The cleaning and storage requirements for each species are slightly different. Black walnut and butternut are easiest to handle and sow if the fleshy husk is removed. If the husks are left on they tend to become soft and mushy and may even heat up like a mulch pile if stored in large quantities. Red oak is relatively easy to handle, but white oak must be collected and planted quickly. Shortly after white oak acorns hit the ground, they begin to extend a root. It is critical that this root not dry out before the seed is planted, so careful storage and timely planting helps maintain seed viability.

Testing seed for quality and viability is also an important part of the process. Some seed, for a variety of reasons, does not mature completely. Other seed, particularly acorns, can be infested with weevils and other seed-eating insect pests that devour the seed before it can sprout and make a seedling. We can use float testing to discover what seed has not produced a complete mature embryo. By throwing seed in a water tank, "floaters" with an incomplete seed embryo will come to the top and can be discarded. Samples from seed lots can be opened to inspect the embryo for condition and presence of seed pests. This information helps us know what percent of viable seed we have in a lot, which informs how many seed to plant per square foot to best utilize nursery bed space and provide optimum growing conditions for seedlings.

Once seed is collected, cleaned, sorted and labeled, it is loaded for the trip to Vallonia Nursery for planting. Most seed is planted in the fall and allowed to overwinter in the seedbeds. This provides the cool moist period, called stratification, required to break seed dormancy and allow the seed to germinate and grow the following spring. Raised seed beds are prepared and furrows plowed to accommodate seed planting. Staff and students from HTIRC do most of the planting and labeling to track the seed lots. Seed is planted, covered and most beds are covered with a straw mulch or planted to winter wheat to provide an insulating and protective cover over the seed for the winter. Next

spring, seedlings will sprout and grow in the beds under the care of the nursery staff for one summer. Seedlings are ready for pulling from the nursery beds and planting in their final homes by that fall or the following spring. Seed collected this fall will produce a seedling that could be planted in the fall of 2014 or the spring of 2015. Some seedlings are destined for progeny testing – evaluation of the offspring of trees we judge to have superior desirable characteristics like fast growth, high quality wood production, or disease resistance. Other seedlings will be used for silvicultural tests – determining how different types of management impacts tree growth and quality. This could include tests on fertilization methods, protection from deer browsing, or different planting densities and pruning methods. Other seedlings may be tested to examine their physiology, metabolism, or chemical makeup. Some seedlings will be used to create new seed orchards for future nut collection and seedling production, to expand the availability of improved seedlings.

The number and species of seed collected is dependent on our planting needs for the following year, and seed crop availability. For 2013, we have collected and are in the process of planting:

- 6650 black walnut seed from over 4 dozen selected family lines.
- 6280 white oak seed from 24 select families
- 6310 Butternut and hybrid butternut seed from over 40 accessions for screening
- 5100 chestnut seed, composed of 1600 pure American chestnut, 3000 hybrid and back-crossed chestnut, and 500 Chinese chestnut

The seedlings produced from these seed will be used for a variety of test and orchard plantings in the Spring of 2015.



Figure 1. Walnuts from a parent tree in an HTIRC orchard, ready for collection and cleaning. Keeping good records of parentage is essential for effective long term tree breeding programs.



Figure 2. Cleaned butternuts ready for sowing.



Figure 3. Black walnut seed cleaned and ready for the nursery bed.



Figure 4. Brian Beheler records details of cleaned seed lots stored in mesh bags prior to planting.



Figure 5. Nursery beds plowed, flagged to separate seed lots, and ready for planting. Look closely in the furrows and you may see the seed ready to be covered.



Figure 6. From the left side of the photo we see the progression from a furrowed bed ready for planting, a planted bed covered with soil, and beds with a living mulch of winter wheat growing over the seed. The covered bed and winter wheat beds are seedlings for sale by the nursery and do not need the flagging to indicate individual seed lots.



Figure 7. Early in the spring, prior to seedling emergence, the winter wheat is sprayed with an herbicide to kill the wheat, and seedlings emerge through the dead wheat mulch.



Figure 8. Seedlings can grow quickly with adequate moisture and fertilization. Oriana Rueda Krauss, HTIRC graduate student, stands among some large hybrid butternut seedlings.



Figure 9. After a growing season in the nursery beds, seedlings are tagged and prepared for lifting and packaging for transport to temporary storage or their planting locations.



Figure 10. Once lifted from the nursery beds as bare-root seedlings, seedlings are bundled and stored in moist wood chips inside a cooler in preparation for planting at their final destination. Most planting takes place in the spring.

The 100th Centennial Celebration of Purdue's Department of Forestry and Natural Resources and home of the HTIRC

By *Shaneka Lawson*, Plant Physiologist

Purdue University's Department of Forestry and Natural Resources (FNR) celebrated 100 years at the end of September. During the weekend long celebration a number of old memories were refreshed and new memories were created. Highlighted at the celebration were images of forestry department students and staff through the years. Photo collages were erected to show the progression of the department over time and invitations were extended to all former graduates, faculty, and staff of the department. In addition to a number of familiar faces, companies that have grown from relative obscurity into household names were also represented and encouraged to attend.



Adams County: 4-H Camp, 1947. Photos: FNR Archives (Accession No. ATP.EXTN.PRI.020)



Upper Peninsula: Summer Camp, 2013. Photo: Dr. Mike Jenkins



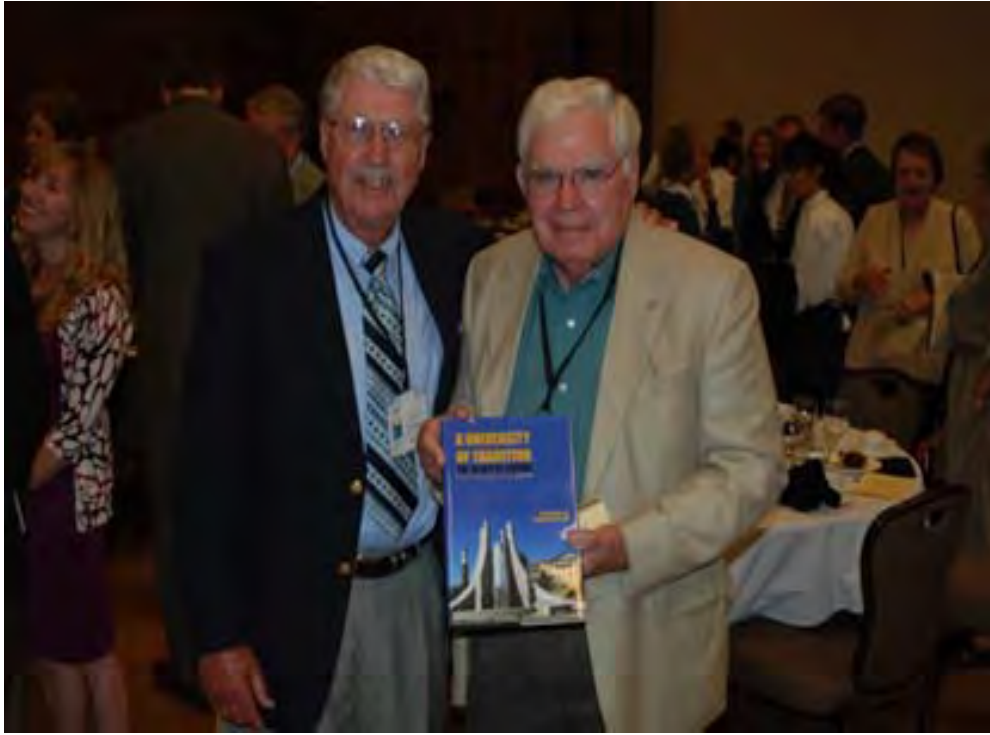
Our HTIRC partners made a strong showing at the celebration and we sincerely thank them for their support in years past and their continued support in the future. In addition to representatives from our partner groups, numerous past and present HTIRC faculty, staff, and students were among the throngs of people that came out to spend time at the celebration.

In addition to seeing old friends and meeting new ones the schedule included guided laboratory tours, oral presentations, and guided field tours. The enthusiasm showed by volunteers and guests made the entire outing a great success. We hope to see everyone back for the next celebration.

The HTIRC was highlighted in several centennial events as depicted in the photos below.



Bill Hoover, Purdue University professor and Chair of the Centennial Committee, presents a plaque recognizing Robert Hollowell and Robert Burke for their support of hardwood research to (from left) Charles Michler, HTIRC Director, Robert Burke, and Julie Hollowell, Robert Hollowell's daughter.



Scott Brundage and Bob Burke, long-term supporters of HTIRC, enjoy a moment at the conclusion of the Centennial banquet.



Shaneka Lawson, HTIRC Plant Physiologist, and several students assist centennial guests with tours of the genetics and plant tissue culture labs. (Cole Bleke, Forestry and Natural Resources undergraduate student pictured with Shaneka Lawson)



Mike Jenkins, Forest Ecologist, and Matt Ginzel, Forest Entomologist, provide information to centennial guests on HTIRC research.



Keith Woeste, HTIRC Molecular Geneticist, points to his US Forest Service shield indicating the partnership between Purdue University and the Forest Service Northern Research Station that supports and advances hardwood research at the HTIRC.



Black walnut research trees at the Martell Forest near West Lafayette, IN.

New Planting and Direct Seeding Guidance for Fine Hardwoods is Now Available

By Lenny Farlee, *Extension Forestry Specialist*

Landowners and natural resource managers have new reference sources available for planting fine hardwood trees using seedlings or direct seeding as a result of the publication of the Seventh Black Walnut Research Symposium by the US Forest Service Northern Research Station. The Walnut Council, a partner organization of the HTIRC, periodically holds research symposiums as part of their annual meeting to provide research-based information to landowners and managers interested in growing and managing black walnut and other fine hardwoods. The USDA Forest Service Northern Research Station has partnered with the Walnut Council to review and publish the symposium proceedings.

Three papers contributed by HTIRC scientists and staff may be helpful to you for planning and establishing fine hardwood tree plantations. These publications provide guidance based on research and practical lessons learned over more than a decade of tree planting.

Herbicide Practices in Fine Hardwood Plantings <http://www.nrs.fs.fed.us/pubs/gtr/gtr-p-115papers/08beheler-p-115.pdf> by Brian Beheler and Charles Michler provides guidance for site preparation and post-planting weed control, including equipment options, calibration, and herbicide options and rates.

Designing and Establishing a Fine Hardwood Timber Plantation <http://www.nrs.fs.fed.us/pubs/gtr/gtr-p-115papers/07mckenna-p-115.pdf> by Jim McKenna and Lenny Farlee details how to plan and execute a successful fine hardwood planting through site evaluation and preparation, plantation design and layout, species selection,

spacing and arrangement, use of genetically improved planting stock, and planning for thinnings and final crop tree spacing.

Direct Seeding of Fine Hardwood Tree Species <http://www.nrs.fs.fed.us/pubs/gtr/gtr-p-115papers/06farlee-p-115.pdf> by Lenny Farlee summarizes research and experience related to planting the seeds of black walnut, butternut, chestnut, and black cherry for reforestation purposes to help landowners and managers recognize the barriers to success and practices that improve performance of direct seeded plantings.

If you would like to see the entire proceedings, it can be found at <http://www.nrs.fs.fed.us/pubs/43788>



Matt Ginzel Highlighted in Purdue School of Agriculture Research Spotlight

Matt Ginzel is an entomologist with a strong interest in the forest. That is a good combination for the Hardwood Tree Improvement and Regeneration Center, where Matt is one of the principal investigators, as well as a professor in the Purdue University Departments of Entomology and Forestry and Natural Resources. Matt's research interest is studying the chemical signals that influence the behaviors of native and exotic wood boring beetles. Some of these insect species, including the walnut twig beetle and peach bark beetle, can damage or kill fine hardwoods like black walnut or black cherry. Research into the chemical signals these beetles use to find hosts and mates may help us learn how to manage the damage done to trees in the process. Matt was recently recognized by the Purdue University College of Agriculture for his research work, and cited the HTIRC as an important resource for the applicability of his work to forest industry and management. "That's where much of outcomes of my work reach stakeholders," he says. "A lot of collaborative work also happens here, and they're very supportive of young researchers."

To read the entire Purdue School of Agriculture article on Matt, follow this link:
<https://ag.purdue.edu/arp/Pages/Spotlight-Ginzel.aspx>



(Matt Ginzel)

Getting Ready for Tax-Time

If you have done reforestation tree planting or sold timber on your property in 2013, you may be able to reduce your income tax liability. Plantings done for timber production may qualify for an expense deduction and amortization of additional expenses. Timber sale income may qualify for capital gains tax rates and some of the income subject to tax may be offset by establishing a cost basis for the timber and assigning a depletion allowance reflecting the cost basis of the timber sold. Here are some resources that can help you understand your options.

An excellent reference for tax management for forest landowners is the National Timber Tax website:<http://www.timbertax.org>.

If you want to learn more about tax issues associated with tree planting, refer to the HTIRC publication *Financial and Tax Aspects of Tree Plantings*:
<http://www.agriculture.purdue.edu/fnr/HTIRC/pdf/publications/FNR-214-W.pdf>

Some publications that can help you with forest management and timber sale tax issues include:

How to Treat Timber Sale Income:http://www.ces.purdue.edu/extmedia/FNR/FNR_FAQ_3.pdf.

Determining Tax Basis of Timber:
http://www.extension.purdue.edu/extmedia/FNR/FNR_FAQ_2.pdf