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THE AUGUST 2016 NEWSLETTER FROM CARLTON PLANTS



Cladrastis kentuckea

CLADRASTIS KENTUCKEA AMERICAN YELLOWWOOD

BY ADAM MCCLANAHAN

Though native to many areas and still uncommon in use in the trade, *Cladrastis kentuckea* (aka *lutea*) is an exceptional tree with very few issues. American Yellowwood blooms in late spring and can put on one of the most spectacular displays with long, fragrant, drooping panicles of either white or pinkish flowers with just a hint of yellow. Unfortunately, many people have never seen it in bloom. The species has become rare in its native habitat and is seldom planted in yards. Yellowwoods typically don't flower profusely every year but rather at two to four year intervals. The flowers then give way to flat, leguminous seedpods that will eventually turn brown.

The leaves are pinnately compound, usually with about 7 leaflets. The foliage is a bright green, plays with light well and is a nice contrast with darker leaved trees. In autumn, they turn into a brilliant golden-

Continued on page 2

IN THIS ISSUE

- CLADRASTIS KENTUCKEA
AMERICAN YELLOWWOOD
- CONTROLLING AMBROSIA
BEETLE
- WEBSITE - GET CONNECTED
- REGIONAL SALES
REPRESENTATIVES



Blooming Cladrastis

yellow but can range from a clear yellow to a golden-orange. Either way, in my opinion, one of the best fall yellows.

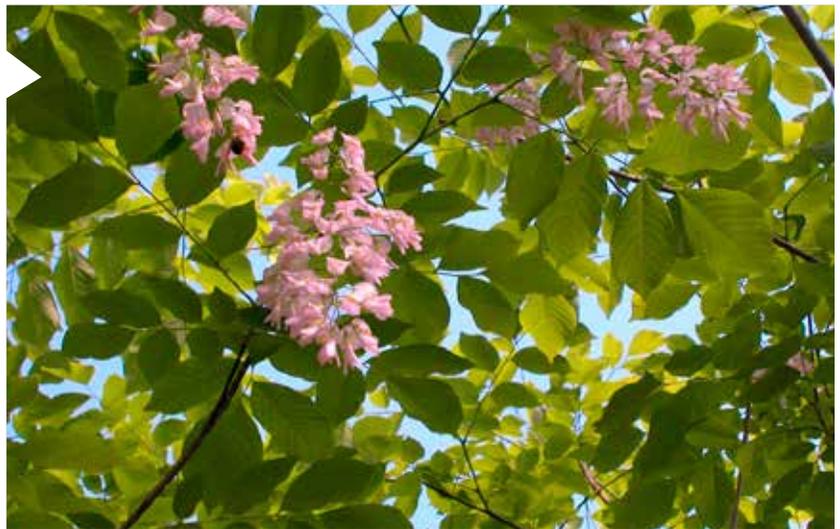
Yellowwood makes for an excellent mid-sized shade tree in a residential setting, in groupings or even as a specimen. They can tolerate a wide range of pH and soil types but will thrive in a reasonably moist, well-drained area in full sun. Once established it will send a taproot, which not only helps with drought tolerance, but also allows for plants to grow well beneath.

Yellowwood have a smooth gray bark and if left unpruned will fork into several main branches a few feet off the ground (and codominant leaders can be a problem). Pruning at a young age and establishing a good central leader are of the utmost importance.

The branches tend to grow close together and the wood can be somewhat brittle. As with most shade trees, prune to remove crossing branches, narrow crotches, and help create strong branch angles. Pruning should be done in midsummer, as it will “bleed” profusely if

pruned in the spring and is susceptible to cracking if pruned in the winter.

Cladrastis kentukea ‘Perkins Pink’ (aka ‘Rosea’) – I have used this tree interchangeably with the straight species for many years, noticing very little difference other than a small blush of pink when the flowers first open, which quickly fades to white. However, this year, after quite possibly the best display of flowers on Yellowwoods that I have seen, I witnessed a wide range of pink hues.



Perkins Pink

The tree received its name from its heartwood, which is a deep yellow and was used to make dyes. Gun makers once used the wood for gunstocks, and settlers in the Appalachian Mountains made dye from the tree’s root bark.

Although native, it is rarely found growing in the wild. In fact, it is on the endangered species list for many states. It is part of the Fabaceae or Legume (pea) family; however, it is one of the few that does not utilize nitrogen fixation. It may have yellowing of the leaves and need fertilization where nitrogen levels are low. However, a soil sample is recommended because stress factors such as drought or wet, heavy clay can also cause yellowing. 🌿



Cladrastis seed pods

CONTROLLING AMBROSIA BEETLE IN NURSERIES

BY STEVE BLACK AND MELISSA HARMEL

RAEMELTON FARM ADAMSTOWN MD

Have you noticed weeping holes in your Styrax? How about funny white toothpicks of sawdust sticking out of your Yellowwoods? Two non-native invasive Ambrosia Beetle species are causing significant losses in nursery fields. The two beetles are hard to control with conventional chemical sprays but there are techniques you can use to stack the deck in your favor.

Entomologist don't have complete understanding of the worst two Ambrosia Beetles *Xylosandrus germanus* and *Xylosandrus crassiusculus* yet. While research continues enough is known about the beetle's life cycle and behavior to begin developing an integrated strategy for managing them.



Ambrosia Beetles are a particular problem in nurseries because of the wide range of trees they attack: Dogwoods, Yellowwoods, Styrax, Magnolia, Sugar Maples, Planetrees, Redbuds, Zelkova, Elm, Beech, and others. The beetle attacks “apparently” healthy trees and it can seem initially like there is no pattern to their choices. Research however has shown that the beetles are attracted to alcohol produced in the tree when its roots are too wet for too long. Keeping Ambrosia Beetle host trees in well drained areas is an obvious first step. The beetle's ability to ‘hunt’ for alcohol is also the key to trapping them.

Preventative trunk sprays with broad-spectrum pesticides have shown some effectiveness but it is far from perfect. Perfect coverage of bark is difficult. Because the beetles don't eat the wood they tunnel into, pesticides are only active as long as they maintain ‘contact’ effectiveness. The beetles will attack major scaffold branches well into the crown. And of course, the most effective pesticides are broad spectrum and will kill anything with six legs—good and bad.

Because pesticides are not a silver bullet solution we have tried to develop a broader integrated strategy for addressing Ambrosia Beetle. Our approach focuses on reducing beetle populations on the farm and giving the beetles that are here, or fly in, an alternate target. While we have moved away from reliance on pesticides for Ambrosia Beetle management all of our other techniques can supplement a chemical program.

Population reduction starts with proper handling of trees that do get hit. Once trees are attacked and the beetles are fully into their galleries the plant will likely never be sellable. Rather than immediately removing the tree we leave it in place to act as a trap for other beetles looking for a home. At this point the only value of the tree is to act as a beetle magnet. We record the location of the tree and set a calendar reminder for 45 days. Ambrosia Beetles take about 55 days to mature so this allows us to remove the trees before the next generation emerges.

Trees that have active Ambrosia Beetle infestation must be removed from the production fields and destroyed. Because the beetle has a flight range of more than a kilometer, infested trees must be destroyed (burn or chip) or removed from the farm. It is not enough to pile the dead trees at the end of the row!

We also try to use the beetle's own hunting ability against it. Research has shown that the beetles are attracted to alcohol and are highly accurate in their hunt for host trees. So we give them “trees” to attack. We hang bolts baited with alcohol along the down wind perimeter of the farm (they hunt into the wind), in areas where we have historically had beetle activity, and in new plantings of highly susceptible hosts.

Research entomologists have used a number of trap designs for monitoring ambrosia beetles. For our purposes a baited

wood bolt is the most cost effective design. We can easily produce a large number of them on-farm. They are easy to deploy and manage. And because they are cheap throwing them away causes no heartache.

Making Trap Bolts

Materials needed depend somewhat on what you have freely available, but a general list includes: Host species tree trunk(s), bee's wax, screw eyes, corks, zip ties, and grain alcohol. Additionally, you'll need access to a chainsaw and something to drill holes in the bolts.

Although using a previously culled tree from the burn pile or making bolts in advance might sound like a good idea, we have found it's best to use a recently cut tree. Choose an unsellable tree or a tree in the landscape with mechanical injuries. This way it's not a complete loss and a form of recycling.

Any tree susceptible to Ambrosia Beetle damage will work, but Maples tend to be an easy source. Additionally they are pretty consistent in shape and have smooth bark. We try to use only the portion of trunk that remains relatively constant in diameter. Usually this is a few inches from the ground until first limbs. Discard everything else. We like to use 2"-2.5" diameter trunks.

Preparing the wood is easiest if you, or your friend, have a chop box saw and drill press. If not, a chainsaw



An Ambrosia Beetle Trap Bolt hanging on a Styrax obassia at Raemelton Farm. (Melissa Harmel / Raemelton Farm)



Drilled Bolt

will do fine along with a drill and vise. Mark and cut 10" sections of wood. Somewhere between 3-5 bolts per tree is normal. These 10" slices then need to have a hole drilled in at one end. Hole size and depth is largely dependent on how often you want to refill bolts. We opt for a deeper and larger hole, about a 1/2" wide and 6" deep. When marking your 10" pieces, try to avoid areas on the trunk where large knots or mechanical injury have occurred. The beetles will drill into those knots and you may have a difficult time recognizing the difference between insect damage and previous cracks and holes.

Bee's wax and corks are easily found at craft stores. Slowly melt the bee's wax and dip bolt about 1" into wax. After the wax cools slightly, repeat 1 to 2 times. This seal ensures no alcohol will drip from bottom, rather it will emit through the wood. Make sure this is the opposite side as the drilled hole. Once wax has completely dried, turn upright, and put screw eyes in on side with drilled hole. When inserting screw eyes, it helps to make a pilot hole with drill then place screw eyes. Otherwise, your poor thumbs will suffer and the wood can crack.

The bolts should be placed in known sites of previous beetle attacks and/or, for preventative measures, in sites where attack is probable, like recently transplanted host species. As far as precise placement goes, there are still plenty of unknowns. We have not yet determined an effective radius for the bolts. Nor do we know how far out the beetles detect the traps. We do know setting up a perimeter, as the first line of defense; along with bolts in each 'danger zone' helps

reduce the problem. For reference we are now placing about 1 bolt per acre in areas of concern and 1 bolt every 300'-400' along the perimeter. Research has found that traps placed about 3' above the ground are most effective. Hang the bolt directly from the lowest limb on possible 'target' trees. Ambrosia Beetles seem to have a highly targeted hunting ability. You can hang your trap just inches away from a host tree, and as long as Ambrosia Beetles have not previously attacked it, we have found the beetles will not touch your crop.

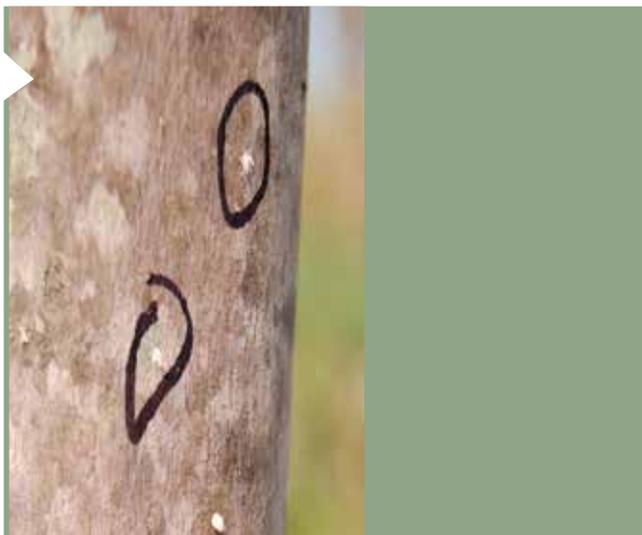
Lastly, don't forget these beetles like to party! The harder the liquor the more attracted they are to the trap bolts. Find the highest concentration grain alcohol from the local liquor store (we use Everclear at 189 proof -- 94.5% alcohol!). Fill the bolts 2-3 times per week throughout beetle season. If you let the party stop, the party moves into your trees. Don't hang a trap and forget about it; it's a good idea to record your bolt locations!



A baited bolt hanging next to a Koelreuteria. Beetle attacks are circled. The bolt was hit more than 30 times with no damage to the nearby crop trees. (Steve Black / Raemelton Farm)

As you monitor and refill your bolts it is helpful to mark the hits on the bolt as you see them. We circle them with a Sharpie. This will help you gauge the timing and level of beetle activity. It is also important

to record the date of first attack, either on the bolt or on your smart phone. 45 days after the first beetle enters the bolt we make a point of disposing of the traps. We don't know if the beetles will complete their life cycle in the bolt, but we don't want to find out the hard way. If beetle activity is still high you can replace the expired bolt with a new one. We usually replace any bolts that show a large number of attacks. Its important to note that there are many borers that



Close up of an alcohol baited wood bolt. Attack holes of various ages are circled. The start of a frass tube from a new attack is un-circled in the middle of the picture. (Steve Black / Raemelton Farm)

may attack your bolts. Not every hole will be from the invasive non-native Ambrosia Beetles. But if you see frass toothpicks it's a pretty good sign your traps are working.

We are just starting to learn how to control Ambrosia Beetle. The baited bolts we use have significantly reduced Ambrosia Beetle damage at Raemelton Farm. Some years we have none. The bolts would also make a great addition to a pesticide based control program (Hang the bolts after you spray). On farms with significant beetle pressure the trapping strategy will probably not provide a perfect solution. But every beetle that attacks a baited wood bolt is a beetle that is not drilling into your crop! 🌿

We are not entomologists! For more information written by experts see:

<https://extension.umd.edu/sites/default/files/docs/programs/ipmnet/Ambrosia%20Beetles%202014-UMD-StantonGill.pdf>

<https://extension.umd.edu/sites/default/files/docs/programs/ipmnet/AmbrosiaBeetles-UMD.pdf>

https://www.ars.usda.gov/SP2UserFiles/Place/02060000/FNRI2009/FNRI_2009_Presentations_Day1/Ranger%2010-14-09.pdf

https://www.researchgate.net/publication/228065895_Ranger_C_M_Reding_M_E_Schultz_P_B_and_Oliver_J_B_Ambrosia_beetle_Coleoptera_Curculionidae_responses_to_volatiles_emissions_associated_with_ethanol-injected_Magnolia_virginiana_L_Environ_Entomol

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