



Nursery News

July 2013



Nursery Program Establishes Herbicide Trials

By Roger Bohringer, Assistant Nursery Manager, Wilson Nursery

Tree planters have always been restricted to a small handful of available products when it comes to tree planting site prep and chemical release from competition. With the rise of forest certification and the resulting bans on many of the most popular chemicals available, landowners' options for site prep and release herbicides are further restricted. As a result of this and other factors, Oust herbicide is becoming the chemical of choice for most Wisconsin tree planters. Oust is a very effective chemical for controlling most common weeds, but with effective rates as low as .5 oz. of chemical per acre, it is crucial to calibrate properly and follow the manufacturer's label recommendations regarding rates and application timing.

Observations made in the field as part of the Wisconsin Nursery Program's regeneration monitoring program have shown that herbicides, including Oust, are frequently being used on tree plantings without strict adherence to the label recommendations. This observation led to the design of a series of trials to test the effectiveness and the observable side effects of various rates and application timings of Oust XP. Our intent is to test applications made according to label recommendations, and at timings and rates that are contrary to label recommendations but sometimes encountered in the field.



Ray Aguilera plants seedlings for the herbicide trial

Thirty two nursery bed rows at Hayward Nursery containing a winter wheat cover crop were planted with 15 plants each of 25 various conifer, hardwood, and shrub species grown by the Wisconsin Nursery Program. Oust XP was applied at either 30 days prior to planting, 3 days or less prior to planting, or within 3 days of the completion of planting. Several rows were also left untreated as control rows.

Rates of Oust XP being tested are 0.5, 1, 2, 3, and 5 ounces/acre. An assessment of each row will be made in late July, using the same seedling assessment criteria used on reforestation monitoring sites.



Oust herbicide trials established at Hayward- June 2013



Cover Crops – What's the Point?

By Sue Crowley, Mississippi River Area Forestry Leader

You have written your best tree planting plan ever. You have carefully assessed the site conditions-- soils, topography, drainage, current vegetation, and potential weed competition. You have chosen the tree species best suited to the site while meeting the landowner's desires for a certain suite of trees and, perhaps shrubs, and likely some cost sharing program's criteria as well. You made specific recommendations for spacing and some consideration of species placement across a site that has some drainage and soil type differences. Your details on the site preparation have accounted for the challenges of the site and include a cover crop. WHAT? The landowner is already shelling out significant currency and sweat equity, why would you want them to plant a whole other crop!

The latter is often the challenge I received from landowners upon their scrutiny of the tree planting plan. So I re-assured them it is worth their while, I tell them I can refer them to others like themselves who have followed through on this regime and have been quite pleased with the results.

The cover crop serves a couple of purposes—so more reason to implement it, than to not. Those purposes are to limit competition from undesirable plants and to prevent erosion and hold the site. The two cover crops I recommend are winter wheat and winter rye. Most of the time, they are planted in the spring. "Prepare seedbed and plant a cover crop of winter wheat with a seeding rate of 1.5 bu/acre." You may plant the trees the next day if you wish. A note about planning, it is often a good practice for the landowner to purchase or secure the wheat or rye in the fall. Some landowners have found it difficult to acquire if they wait until the spring.

Winter wheat or winter rye is utilized because it requires a certain amount of vernalization before it will flower and go to seed. Vernalization is essentially a chilling period. When winter wheat doesn't get this adequate chilling period it is much less likely to flower and seed out or it does so at much slower rate. Consequently planting it in the spring often achieves this effect. For tree planting this is perfect. One still needs to recommend that the landowner pays attention and clips the winter wheat or winter rye before it does go to seed. We don't want to risk that the spring conditions turned out to be favorable for adequate seed development.

One may recommend planting the winter wheat in fall, its normal planting time, if a site is particularly wet in the spring. The winter wheat will still provide the ground cover and erosion control and inhibit undesirable competition with the new tree seedlings. In addition, it will also provide much needed traction and stability for the actual planting of seedlings in the spring. However, it will be very critical to clip the winter wheat in a timely fashion early in the spring to retard seed production.



Winter wheat cover crop

You can see in the above planting that it was also band sprayed before leaping out. The picture was taken about three weeks after planting of the seedlings. The landowner was diligent and followed the plan to the letter. His hardwood plantation is growing well!!



Fall planting of winter wheat

This landowner concerns about traction in the field if the spring weather was particularly wet so opted for a fall planting. The picture at the bottom of the last column was taken the day the trees were planted. In this case, it is crucial to clip the winter wheat early before it goes to seed.

I must give credit to Forester Bill Ruff (Door Co.) and Forester Scott Fischer (Shawano Co.) for the guidance and insights into cover crops. I did not tinker much beyond the wisdom they imparted and it has served well.

Feel free to contact me, Bill, or Scott, if have any questions. Consequently, many landowners were thankful they performed the extra steps to put in a cover crop.



Butternut Conservation in WI - Seed Orchard

Establishment

By David G Stevens dstevens@wisc.edu

Tree Improvement Research Specialist

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Butternut (*Juglans cinerea*), sometimes referred to as white walnut, is a native Wisconsin tree prized for its nuts by both wildlife and humans and for its quality lumber. The species is found throughout the state, with the exception of the three northern most counties, but has been declining steadily since the introduction of butternut canker disease (*Ophiognomonia clavignenti-juglandacearum*), first reported in Wisconsin in 1967. Formally classified under the genus *Sirococcus*, the exact origin of the disease is unknown, but most agencies regard it as an 'exotic' pest. Trees infected with the fungus develop branch and stem cankers which eventually girdle and kill the tree.

Beginning in the 1980's, an increasing number of phenotypically disease free trees have been identified growing along-side infected trees throughout the species range, including in Wisconsin. While tolerance or resistance to the disease has yet to be confirmed, putatively disease-free trees from infected areas have been screened and indicate there is a wide phenotypic variation in susceptibility to the disease. Along with this, recent studies have shown that there is a high level of genetic diversity present within the species across its range. Given its environmental and economic history in Wisconsin's landscape and continued disease pressure, it has become apparent that an active program is needed to conserve the species to help prevent its extinction from the state.



An additional obstacle compounding the selection and re-introduction of disease resistant butternut is its ability to hybridize with Japanese walnut (*Juglans ailantifolia*). Since Japanese walnut was first introduction into the U.S. in the 1860's, naturally occurring interspecific hybrids and backcrosses between the two species are now found across much of butternuts native range. Designated as *Juglans Xcinerea*, these complex hybrids are more productive, vigorous and disease resistant than butternut while maintaining the appearance of butternut. Due to their near identical

appearance, using morphological traits to distinguish between pure butternut and the hybrid is difficult and has greatly complicated the selection of disease resistant butternut. Fortunately, the identification of DNA-based markers has made it possible to positively distinguish between the hybrids and the species.

Once a putatively disease free tree is identified, a grafted clone of the tree is created. To do this, a dormant branch piece containing buds from the previous year's growth is collected during the winter and grafted onto black walnut (*Juglans nigra*) rootstock. Black walnut, a close relative of butternut, is used as a rootstock as it is resistant to the disease thus eliminating the possible infection of the graft from the rootstock.

The Wisconsin Tree Improvement Program, a cooperative effort between the WDNR Division of Forestry and the UW-Madison Department of Forest and Wildlife Ecology, have partnered with the USDA-Forest Service to establish a butternut genetic conservation project. In the spring of 2013 the Tree Improvement Program, with the help of the WDNR's Nursery Program, out planted 79 putatively resistant, and grafted pure butternut clones at the WDNR's Hayward Nursery complex. Seventy-four clones were generated from 14 selections made in five different Wisconsin counties along with five clones from 2 selections from two bordering Minnesota counties. The selections and clones were made by the USDA-Forest Service's Oconto River Seed Orchard and the USDA-Forest Service's Hardwood Tree Improvement and Regeneration Center (HTRIC). It is hoped that additional selections will be added to the planting over the next few years as they become available. The planting will serve both as a clone bank to preserve pure butternut of Wisconsin origin and as a seed orchard to supply seed to the WDNR Nursery Program. A hand full of seeds will most likely be produced by the orchard this year, while sizable seed crops should be expected within 10 to 15 years. Research is currently underway at HTRIC to measure variation in resistance, as well as, to define the heritability of the resistance trait in off spring.



Butternut Seed Orchard at Hayward State Nursery - 2013



YouTube Reforestation Video Premieries in October

Throughout the year, the nursery team has honed their performance skills with supporting roles provided by the DNR's

Office of Communications. Our YouTube release will coincide with the opening of seedling ordering in early October and highlights multiple aspects of tree planting success. Give us your reviews!



Root, Root, Root for the Brewers

On May 1, 2013, the state nursery teamed up with the Milwaukee Brewers for the third consecutive year and distributed 7,500 white spruce seedlings at the Brewers vs. Pittsburgh Pirates game. The seedlings were packaged in partnership with the Wisconsin Dept. of Corrections Secure Program Facility at Boscobel.



Jim Storandt, Griffith Nursery Manager, throws out the ceremonial first pitch at a Milwaukee Brewers game

Feedback Needed: New Trucking System

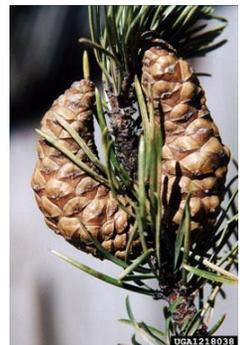
The state nursery program implemented its new statewide trucking system in the spring. Although distribution season was fraught with lingering frost in the beds, late heavy snows and general inclement weather which mandated adjusting shipping schedules multiple times, the nursery team was pleased with the overall results.



Now, we need feedback from our customers! Please send your comments to Roger.Bohringer@wisconsin.gov or to Wilson State Nursery, Box 305, Boscobel, WI, 53805.

New Jack Pine Cone Buying Stations Established

Meeting annual purchasing goal for jack pine cones can be challenging, especially as county forests increase the acreages they direct seed. As a proactive measure, the nursery program established new jack pine cone buying station at the Barnes Ranger Station and Washburn Ranger Station. An additional buying station is expected to be established in Black River Falls later this summer. Thanks to our forestry staff who are eagerly supporting this effort! To learn more about our seed purchasing program read the Seed Collector's Newsletter found on our web page.





American Elm Reforestation Trials:

An Upper Mississippi River Watershed Partnership

By Greg Edge, Forest Ecologist/Silviculturist and
Joe Vande Hey, Wilson State Nursery Superintendent

American elm was once a dominant tree species in the bottomland forests throughout its range in the eastern United States. Unfortunately, epidemics of Dutch Elm Disease (DED), caused by the introduced fungi *Ophiostoma ulmi* and then *Ophiostoma novo-ulmi* and carried via both native and introduced elm bark beetles, swept across the United States starting shortly after World War I killing most mature American elm. Today young elm trees are still reproducing well in our forests, but they rarely reach a large size.

The loss of American elm, especially as an important urban shade tree, spurred a number of tree improvement efforts starting in the 1930s. These programs identified and selected a handful of American elm cultivars with varying levels of DED tolerance. A seed orchard of approximately 10 of these cultivars was established in Delaware, Ohio by the US Forest Service Northern Research Station. Work continues testing the actual level of DED tolerance in these cultivars and identifying additional DED tolerant elms from wild selections, with a long-term goal of developing DED tolerant reforestation stock that is well adapted to North American forests. These elm tree improvement efforts are not easy and require the long-term commitment of individuals and institutions.



1-0 American elm seedlings at Wilson State Nursery

Due to the major obstacle of DED, elm reforestation efforts have been historically limited and little is known about working with this species in field operations. However, recently available seed from the USFS seed orchard in Ohio created the opportunity to start small reforestation trials in order to learn more about successful nursery culture and reforestation with American elm. The seed for these trials is open-pollinated (i.e., known female, but unknown male) from DED-tolerant mother trees. Research has shown that some DED tolerance is heritable, so this seed is considered “enriched”, as it has a high probability of having some DED tolerance. The purpose is not to test its DED tolerance however, but rather to learn how to successfully grow and establish elm in a forest setting. This type of reforestation knowledge will be important as more suitable DED tolerant growing stock is developed and as restoration of bottomland forests becomes more critical due to impacts from Emerald Ash Borer and other invasive species.

In 2012, a partnership between the US Forest Service (both Research and State & Private Forestry), Wisconsin DNR, Army Corps of Engineers, Iowa DNR, Minnesota DNR, and Southwest Bader RC&D began elm reforestation trials on the Upper Mississippi River watershed. The enriched elm seed was sown at the WDNR Wilson State Nursery in spring 2012. This spring one year old (1-0) seedlings were lifted and distributed to the partners. Some seedlings were held over to produce two year old (2-0) stock for comparison purposes, but preliminary results indicate that 1-0 stock will be sufficient in size and root development for most reforestation needs (see picture). The seedlings were planted on a variety of bottomland forest sites; from old fields to harvest gaps of various sizes to under-planted stands. Most plantings included a mixture of other appropriate bottomland tree species in order to compare performance. Planting challenges included high river levels that delayed planting well into June on some sites, reed canary grass competition, and monumenting of the sites for future follow-up. The plantings will be maintained and monitored by the partners in future years for survival, height growth and DED incidence. So stay tuned!

THE MISSION of the state nursery program is to insure a consistent supply of high quality seedlings, of desirable forest species, at an economical price, to encourage reforestation in Wisconsin.

Nursery News is published in January and July with the intent to keep individuals abreast of regeneration topics.

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