Hello Northeast Ohio Counties!

We’re inching closer to harvest, but we are still a couple of weeks away for the many parts of the region. Down in Madison county, they are on the dry side, and many bean and corn fields will be ready for harvest this weekend. Despite all our rain earlier this year, we were fortunate to have timely rains late in the summer.

If you make it down to FSR, be sure to stop by the Ag Crops tent and say hello! We'll be around somewhere, and we hope to meet you there!

Stay safe!
Above normal temperatures will continue for the rest of September
By: Jim Noel

NAEFS 16-day Ensemble Mean Total QPF from 9/15/19

After a cooler start to September it was expected to be warmer than average and that has happened and will last the rest of the month. Highs will generally be in the 70s and 80s north half and in the upper 70s to near 90 range in the south half. Lows will generally be in the 50s and 60s. This will be several degrees above normal.

The first half of September was expected to be drier with a trend to normal or wetter weather in later September. Indications are that we will remain at or below normal rainfall for most of the state for the remainder of September. Over the next two weeks, rainfall is forecast to be mainly an inch or less with normal being 1.0-1.5 inches. The main rain areas will be off the southeast U.S. coast and in the upper Midwest as the attached two week rainfall graphic shows. High pressure will remain in control of a good portion of the southeast third of the U.S. as tropical activity off the U.S. Southeast Coast will help strengthen the high pressure in the Southeast.
Probabilities support our first first freeze at or later than normal for this autumn. Typically it occurs in the Oct. 10-20 range for much of the state. It is highly unlikely we will see anything before Oct. 10.

Looking at October, we expected near to slightly above normal and rainfall not too far from normal.

Considerations for 2019 Wheat Planting
By: Andy Michel, Laura Lindsey, Pierce Paul

With the autumn rapidly approaching, wheat planting is likely to begin soon. Planting after the Hessian fly free date remains the best chance to avoid issues with insects and diseases, as well as helping ensure good agronomic quality. Some benefits of the fly free date:

Northeast Ohio Agriculture

OHIO STATE UNIVERSITY EXTENSION
Ashtabula and Trumbull Counties
Hessian Fly: Adults of the Hessian fly lay eggs in emerging wheat. These eggs then hatch into small larvae that feed before spending the winter as a flaxseed. The early autumn feeding will stress the young wheat plant right before the winter, resulting in stunted and wilted plants. Very little egg laying occurs after the fly free date, which helps to limit infestation. Wheat varieties with resistance against the Hessian are available, in addition to seed treatments, which can help limit damage.

Aphids: Two main aphids infest wheat in Ohio: the English grain aphid and the bird cherry-oat aphid. These aphids rarely cause economic injury on wheat from feeding. However, they can transmit several viruses that can severely impact wheat including Barley Yellow Dwarf virus. These aphids do not only feed on wheat, but several other grasses that serve as natural sources of viruses. If wheat is planted too early, and emerges before the aphids overwinter or stop feeding, they can be early transmitters of viruses. Although seed treatments could help kill the aphids, they may survive long enough to transmit the virus to the plant. Any transmission in the autumn would likely serve as a local source in the following spring.

Other foliar diseases: Although not directly related to the Hessian Fly, planting after the fly free date also helps to reduce the early establishment of leaf diseases like Stagonospora leaf blotch and powdery mildew. Planting date is indirectly linked to spore production by fungi that cause these diseases and infection of young plants. The earlier you plant, the more spores are available, and the more suitable (warmer) conditions are for infection. Fall infections often leads to more damage and greater yield loss in the spring, especially of susceptible varieties are planted and not protected with a fungicide at Feeks 8 (flag leaf emergence). As conditions become cooler after the fly free date, pathogens that cause leaf diseases become last active, and as such, are less likely to infect plants.

Developing a Plan to Control Problem Weeds
By: Les Ober, CCA

You have been fighting Marestail for years. You have watched one reliable herbicide after another gradually become ineffective on some of our hardest to control weeds. Now Waterhemp and Palmer Amaranth is showing up on neighboring farms. In a time of uncertainty in agriculture, this is not good news. Despite feeling like we are on the edge of Pigweed Armageddon this is not a time for panic. It is however, time to sit down and take a good hard look at your weed control program. The same basic approach we have been prescribing to control Marestail is the same basic prescription you need to follow to control Waterhemp and Palmer with some modifications. The important thing to remember this is no longer a one herbicide does all approach. It needs to be a systems approach that will start this fall.
The first thing to remember is that even though all three species are considered annual weeds there is a distinct difference between the life cycles of Marestail and Waterhemp or Palmer Amaranth. Marestail is a winter annual that has morphed into a summer annual. The plant populations are developing in the late fall into early spring and throughout the summer. This is the reason that our weed specialist place importance on a fall application of chemicals to control this weed. If you are planting soybeans you want to start with a clean seedbed in the spring, either from tillage or chemical burndown. The Fall Burndown approach has proven to be the most effective and cheapest way to do this in soybeans. Once we get into the spring and on into the summer there can be multiple generations of the same weed to deal with. That is the reason for using a pre-emerge residual herbicide which is effective well into the season. Another characteristic of Marestail is that it traditionally it does not compete well with a vigorously growing crop. This is the reason for getting an aggressively growing crop soybean canopy established in a timely manner. Both of these applications can be followed with a timely post-emerge application but care needs to be taken when selecting a post product. Marestail is resistant to many of our post emergent herbicides like Glyphosate (Group 9) and just about all of our Group 2 herbicides. When selecting herbicides whether pre or post make sure you are switching up modes and sites of action to slow down resistance. Another tool is to maintain a rotation with crops like corn or small grain. This is also a great opportunity to include cover crops that compete with Marestail.

The new weeds that have shown up locally are Waterhemp and Palmer Amaranth. These are true summer annuals, both members of the Pigweed Family. Unlike Marestail that can establish itself at different times of the year these pigweeds establish in the spring and continue throughout the summer. They have a decided advantage over other plants and weeds growing in the same field. Both Palmer and Waterhemp develop a very high plant seedling populations, upwards of a million seeds per plant. They are very vigorously growing plants. Waterhemp can average 1.25 inches of growth per day. This means that within a week the weed can reach a growth stage that is very hard to control chemically. The one positive factor is that the seeds have a low viability rate in the soil with less normally 1 to 12% remaining viable after 4 years. Both plants have obtained a high-level resistance to herbicides. Waterhemp is now resistant to 6 different groups chemical many exhibiting multiple herbicide resistance. Palmer has shown resistance to Group 2, Group 3 Group 5, Group9 and Group 27. Keep that in mind when you are setting up a weed control program in both Corn and soybeans.

Palmer Amaranth typically emerges later in the season. This is one of those; where did this weed come from, weeds. We have been dealing this type of growth pattern in Foxtail for years. Late emerging somewhat inconspicuous growth until it matures and takes over the field. Palmer will not remain inconspicuous for long because its daily growth rate matches or exceeds Waterhemp and both are almost impossible to control once they reach maturity. That is why we tell producers, you need to start clean, with
either tillage or a Chemical Burndown. You then need to put together and effective Pre-Emergence program with multiple sites of action that will stretch far enough into the season to control the weed. Follow this with a timely Post-emergences program. This may require using additional residual control in the post program. All this information is outlined in the Weed Control Guide. Also avoid the possibility of moving weed seed from field to field. If you have Palmer or Waterhemp make sure that this is the last field, you harvest. Once harvested followed up with a thorough cleaning/sanitation of the implement. Never harvest silage from a field with Palmer or Waterhemp for fear it will contaminate the manure that has to be spread on other fields. The ensiling process will not generate enough heat to kill the germ of the weed seed.

Even though control measures for these weeds look complex they are very similar. It requires homework of the part of the producer. You need to know how to identify the plant. You then need to have knowledge of the life cycles of these weeds so that you can make timely applications of chemical. You need to know the resistance patterns and which chemical are still effective and which are not. Be aware that there are knew chemicals coming on the market but unlike Roundup in the early Eighties there are no silver bullets. Also remember, why products like Glyphosate are not as effective today. Their ineffectiveness is the result of over use and dependence on one form of weed control. Finally, you are not alone in this fight. CFAES OSU Extension is there to help identify and give advice through the entire process if needed. We are all working to keep these invasive noxious weeds under control and out of the area. The important thing to is to never let Waterhemp or Palmer it go to seed, (Kill it, mow it, till it or pull it, just never let it go to seed). Remember; “NO Pigweed Left Behind Go Rogue! Stop the Seed”

Reduce, reuse, recycle: the future of phosphorus
By Susan V. Fisk

When Hennig Brandt discovered the element phosphorus in 1669, it was a mistake. He was really looking for gold. But his mistake was a very important scientific discovery. What Brandt couldn’t have realized was the importance of phosphorus to the future of farming.
All crops need phosphorus for healthy growth. Phosphorus is a building block of plant protein. Working to reduce, reuse and recycle phosphorus will make a more sustainable food system.

Phosphorus is one of the necessary ingredients for healthy crop growth and yields. When farms were smaller and self-sufficient, farmers harvested their crops, and nutrients rarely left the farm. The family or animals consumed the food, and the farmer could spread manure from their animals onto the soil to rebuild nutrients. This was a fairly closed-loop phosphorus cycle.

But, as the world’s population increased, so did food and nutrition needs. More of a farmer’s harvest, and therefore nutrients, was sold off the farm. Agriculture adapted by developing many new growing methods, as well as fertilizers. Most phosphorus fertilizers use the world’s supply of phosphate rock as a main ingredient. That main modern source is a finite resource and it’s running out. Phosphate rock is also hard to mine and process.

“There is an urgent need to increase phosphorus use efficiency in agroecosystems,” says Kimberley Schneider, a research scientist with Agriculture and Agri-Food Canada. “There are many chemical, physical and biological processes that affect the availability
of phosphorus to crops.” This is why farmers place great importance in having enough phosphorus for their crops.

**Crop breeding and cultivar selection**
Different plants can use phosphorus more efficiently than others. “Phosphorus use efficiency is the ability to yield more crop per unit of phosphorus taken up by the plant,” explains Schneider. “There is potential for crop breeders to develop new varieties that use phosphorus in even more efficient ways. They can also breed crops that work with mycorrhizal fungi in the soil to help increase their phosphorus absorption. Focusing on breeding plants that work well in low phosphorus soils will take an interdisciplinary approach.”

![Struvite](https://example.com/struvite.jpg)

*Struvite is a substance made by refining wastewater and recapturing the phosphorus. It can be used as a fertilizer, and recycles this important nutrient. Credit: Joanne Thiessen Martens.*

**Cropping system design and phosphorus use efficiency**
Since some crops can increase soil phosphorus availability for future crops, growers could focus on crop rotations that take advantage of this. Cover crops and green manures can also contribute to phosphorus availability in many conditions. For example, one study found sorghum did well with phosphorus use after alfalfa or red...
clover, but not after sweet clover. Getting the right combinations for the right crops and fields will be important.

Soil organic matter's role in mineralizing phosphorus
Soil organic matter is known to indicate soil health. It can improve plant phosphorus availability by allowing for greater root access to phosphorus and by releasing plant available phosphorus. Currently, soil organic matter is not part of the soil fertility measurements on farms, so this is an area of future research potential.

Naturally occurring soil fungi to the rescue
Many soils contain one or more types of friendly fungus called arbuscular mycorrhizal fungi. They work with plant roots to exchange "life chores." The fungi help free up phosphorus and other nutrients, while the plants make sugar compounds that the fungi use for growth. Of course, the fungi and roots must be able to be near one another for this exchange to happen. Researchers are looking at the promise of building up and better utilizing mycorrhizal fungi populations in soils.

Recycling and recovering phosphorus
Phosphorus is the 6th most common element on earth. Yet, it is a limiting factor in crop yields. Excess phosphorus in the wrong place – streams, lakes and other waterbodies – causes pollution. How did this come to be?

Let’s trace the "life cycle" of a phosphorus molecule. Most phosphate rock is mined on the continents of Europe and Africa, although some deposits are available elsewhere. After it is made into fertilizer, this phosphorus is then moved to farms. From there, the phosphorus is used by a plant to make a product, perhaps a soybean. The soybean is removed from the farm and manufactured into tofu. It is then transported to your local grocery store, where you buy it and bring it home. If you live in a city, after you enjoy your meal of fried tofu, the waste your body produces flushes down the toilet. If you live in a rural area, it goes into the septic system.
Healthy soil contains fungal networks (white thread-like material) that help with the transport of nutrients to plant’s roots. Future research may find more ways to enhance fungi’s role in capturing phosphorus for crops. Credit: SV Fisk.

Thus, the life cycle of this illustrative phosphorus molecule shows a broken cycle. The molecule originates far away from its final resting place. Because of modern day life, the phosphorus cycle that used to exist on farms is broken. The more urban society becomes, the more broken the phosphorus cycle is – unless scientists come up with answers to close the loops again.

Agricultural scientists are working with wastewater managers to develop ways to put those deserving phosphorus molecules back to work on the farm. “While most currently available phosphorus recovery technologies may not seem economically viable, the environmental and social benefits are important,” says Schneider. “There are also other valuable products of phosphorus recovery, such as organic matter, other nutrients, and even water.”

“Increasing phosphorus use efficiency in agroecosystems must be a priority to reduce reliance on fertilizer and to minimize the effects on the environment,” says Schneider. “There are many possibilities for the agricultural system to improve the use of...
phosphorus. The outcome will be an agroecosystem that still feeds the world, while protecting the natural resources that help us grow our food and live healthy lives."

This article was recently published in a special section in the *Journal of Environmental Quality* called Celebrating the 350th Anniversary of Discovering Phosphorus—For Better or Worse.

The American Society of Agronomy and Soil Science Society of America are celebrating Phosphorus Week September 15-21, 2019, to raise awareness of phosphorus issues, and their importance in our food and urban systems. In addition to this web story, they have created five blogs with further information:
- The discovery and general uses of phosphorus
- Why is phosphorus needed on farms
- What are sources of phosphorus for crops
- What are the challenges regarding phosphorus use
- Ten things we can do to manage phosphorus better

**Repeal and Replace of WOTUS: Step 1 Complete**

By: Ellen Essman, Senior Research Associate, Senior Research Associate Friday,  
Written by Ellen Essman and Peggy Hall  

What’s old is new again. To what was likely a mixed chorus of cheers and groans heard around the nation, the U.S. EPA and Army Corps of Engineers today [announced](https://www.epa.gov/opa/pr/2019/09/300920190016.html) the repeal of the 2015 Waters of the United States (WOTUS) rule. The action is “Step 1” in the Trump administration’s two-step plan to repeal and replace the WOTUS rule, which establishes the jurisdictional authority of the EPA and Army Corps over waters and waterways. It came in the form of a [final rule](https://www.epa.gov/owow/final-rule-repeal-2015-wotus-rule) that not only repeals the 2015 WOTUS rule set in place by the Obama Administration, but also reverts the entire country back to the old regulatory definitions of “waters of the United States” that were developed in 1986 and 1988 rulemakings and further interpreted by U.S. Supreme Court decisions. Those definitions of WOTUS created a lot of confusion and litigation over the actual meaning of WOTUS, which the 2015 WOTUS rule aimed to clear up. Today’s “Step 1” takes us back to older, earlier definition of WOTUS.

*Wait—there’s a Step 2?*

Back in February, we wrote a [blog post](https://farmoffice.osu.edu/blog/fri-02152019-904am/2019-02-15-2019-02-15/ohio-ag-reg-def-wotus-update-02-15-19) when the Trump administration began what is now “Step 2,” proposing a new definition of WOTUS. If that rule becomes final, it will replace the pre-2015 WOTUS definitions put in place by today’s announcement. So, Step 1 involves reverting back to the old WOTUS definition until Step 2, implementing a new definition, is finalized.
The Trump administration’s proposed WOTUS rule scales back the reach of the 2015 WOTUS rule, which many claimed exceeded the agencies’ regulatory authority over waterways and waterbodies in the U.S. Under the currently proposed rule, tributaries that are “ephemeral”—meaning those that are not around for a great deal of time or created by temporary conditions like rainfall or snowmelt—would not be considered as WOTUS. In both the 2015 and pre-2015 WOTUS definitions, at least some ephemeral streams fell under federal regulation. The currently proposed rule also clarifies waters that are not WOTUS by including a list of such waters. The Trump administration states that its proposed rule would encompass fewer ditches, lakes, ponds, and adjacent wetlands than both the 2015 and pre-2015 versions of WOTUS. 

So what’s WOTUS now, exactly?

Until the tide turns again, the definition of WOTUS set in place by today’s announcement is the pre-2015 rule, which is as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: (i) which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified above;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified above;

The current WOTUS does not include prior converted cropland or certain waste treatment systems. Importantly, it also contains definitions for the terms wetlands, adjacent, high water, ordinary high water mark and tidal waters—many of these definitions have been the source of the litigation and confusion that led to the 2015 rule. Read more about the new, old and proposed WOTUS rules on EPA’s website, here. A fact sheet comparing the three versions of WOTUS is here.
**Palmer amaranth's molecular secrets reveal troubling potential**

By: University of Illinois College of Agricultural, Consumer and Environmental Sciences


Corn, soybean, and cotton farmers shudder at the thought of Palmer amaranth invading their fields. The aggressive cousin of waterhemp -- itself a formidable adversary -- grows extremely rapidly, produces hundreds of thousands of seeds per plant, and is resistant to multiple classes of herbicides, including glyphosate. Palmer's resistance to PPO-inhibiting herbicides, a group of chemicals that disrupt chlorophyll synthesis, is especially problematic with glyphosate out of the picture. Farmers had been turning to PPO-inhibitors as an effective alternative, until resistance was discovered in waterhemp in 2001 and in Palmer in 2011.

Pat Tranel from the University of Illinois has been working to understand the mechanisms of resistance to PPO-inhibitors for years, and was the first to discover key mutations in both weed species. Now, in two new studies, he goes farther to explain Palmer's evil genius.

"We knew Palmer had the same molecular mechanism as waterhemp to resist PPO-inhibitors, a genetic mutation known as the gly-210 deletion, and at least one more. Now we know that it evolved the gly-210 deletion independently, rather than picking it up through hybridization with waterhemp," says Tranel, associate head and professor of molecular weed science in the Department of Crop Sciences at U of I.

This is important in two ways. It's good news that scientists aren't finding evidence of hybridization between the two superweeds, at least not so far. But the fact that Palmer evolved the same mutation independently, and at least one more to boot, shows just how wily the weed is.

Tranel and his team determined the evolutionary origins of the gly-210 mutation by looking at the genetics of resistant plants of both species that were growing together in a Kentucky field. Being in close proximity for several years should have provided opportunity for hybridization, if it was going to happen.

"We know from lab experiments that they are capable of hybridizing, so the fact that it's not happening in the field is a good thing. The more they can and do hybridize, the more concerns we'd have," Tranel says.

Only about a third of the Palmer plants in the Kentucky field had the gly-210 deletion. The rest were using a different mutation -- an arginine substitution -- to ward off PPO-inhibitor damage.

"The finding that this population of Palmer has two different mutations is a concern because if you look forward in the future, Palmer is well positioned to deal with future PPO chemistries. It can use whichever is more effective against a new PPO.

"It's also well positioned to combine the two mutations to create a double mutant, with both mutations on the same copy of the chromosome. Chemistry designed to kill plants
with the gly-210 deletion won't be able to kill double mutants," Tranel says. "In my opinion, it's just a matter of time until we see double mutants in the field."

Tranel's second new study explains why Palmer amaranth took a decade longer than waterhemp to develop the gly-210 deletion, and reveals another diabolical truth about the species: Palmer amaranth appears to be naturally tolerant to post-emergence PPO-inhibitor application.

It has long been recognized that the timing of post-emergence PPO application is especially critical for Palmer amaranth, relative to waterhemp. If Palmer plants aren't sprayed before they reach about 4 inches, it's all over.

"If you wait too long, you miss 'em. And too long can be a matter of a single day because Palmer grows so fast. It can go from a 4-inch plant where you could control it to a 6-inch plant literally in a day," Tranel says.

For Tranel, the pattern suggests a natural tolerance to post-emergence PPO-inhibitors. Tolerance describes the ability of a species to handle a substance, in this case PPO herbicides. Resistance, on the other hand, happens at the population level; localized populations of the species evolve mutations in response to repeated exposure to the substance. For example, corn is tolerant to atrazine. It can handle being sprayed and doesn't need to evolve a mutation to handle it in a particular population.

The idea is that Palmer amaranth has a natural tolerance to PPO inhibitors and didn't need to develop resistance. That's why it took longer to evolve the gly-210 mutation. But, until now, no one had specifically studied Palmer's tolerance to the chemistry before.

Tranel confirmed it by growing Palmer and waterhemp plants with and without the gly-210 mutation side-by-side and applying different formulations of pre-emergence and post-emergence PPO-inhibitors. The post-emergence applications were done early (smaller than 4 inches) or late (taller than 4 inches).

"We found that 'sensitive' Palmer plants without the mutation survived just as well as resistant waterhemp when sprayed post-emergence," Tranel says. On the other hand, the research team found that pre-emergence formulations effectively controlled both species.

"The difference in tolerance between Palmer and waterhemp goes away at the pre-emergence stage," Tranel says. "Ultimately, that's the take-home message here. If you're dealing with these weeds, especially Palmer amaranth, and you want to incorporate a PPO-inhibitor as an alternative effective mode of action, you'll have much better luck if you use it in a pre-emergence application."

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**Story Source:**
Materials provided by University of Illinois College of Agricultural, Consumer and Environmental Sciences. Note: Content may be edited for style and length.

**Journal References:**
(Amaranthus tuberculatus) and Palmer amaranth (Amaranthus palmeri). Weed Science, 2019; 67 (05): 521 DOI: 10.1017/wsc.2019.41
2. Kathryn J. Lillie, Darci A. Giacomini, Patrick J. Tranel. Comparing Responses of Sensitive and Resistant Populations of Palmer Amaranth (Amaranthus palmeri) and Waterhemp (Amaranthus tuberculatus var. rudis) to PPO Inhibitors. Weed Technology, 2019; 1 DOI: 10.1017/wet.2019.84

Extended Forecast from NOAA, Weather.gov

**Cortland, OH**

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Upcoming Events

Lee Beers
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From steadfast survival and reproduction to pollination and even charming tales of maternal care, insects and spiders keep our gardens buzzing with adventure. Join bug and botanical portrait photographer Danae Wolfe on a journey through your garden to discover the stories of insects and spiders. Uncover the fascinating tales of the curious creatures among our plants and explore how to capture incredible images of bugs on any budget.

Danae Wolfe is a digital engagement and educational technology specialist with Ohio State University Extension. She has over 10 years’ experience designing and facilitating learning opportunities that span natural resources, horticulture, digital engagement, leadership, and her personal passion of photography. She was invited to speak at TEDxColumbus 2018 on the power of photography in fostering appreciation and conservation of insects and spiders. Her current work focuses on improving digital engagement strategies and fostering innovation throughout Extension.

Complete the below information and send with payment to OSU Extension Trumbull County, 520 West Main Street, Cortland, OH 44410. Please make checks payable to OSU Extension.

Name: ____________________________________________ Phone: __________________________ Email: __________________________

Number Attending: ____________ X $20/person = ____________ Total Enclosed $__________

Cost: $20/ person; $15/Trumbull MGVs; includes light refreshments
Ohio's Tree Farm of the Year Tour

Snowy Oak Tree Farm

September 21st, 2019 - 9:30 AM to 3 PM

Paul and Joanne Mechling welcome family, friends, fellow tree farmers, conservationists, and the general public to their 365 acre Certified Tree Farm. Come explore 8 miles of trails, view forest management, examine 12 acres of wetlands, walk through warm season grasses and pollinator habitat, and learn how to plant wildlife food plots. Professional foresters will conduct interpretive tours of the property.

Location: St. Route 167 East, Pierpont Township, Ashtabula County, Ohio
Parking is at the Pierpont Township Fire Hall, 6006 Marcy Rd Pierpont, OH 44082. Shuttle service will be provided to the farm. See map on back.

Presentations/Displays/Exhibitors:
◊ Red oak regeneration  ◊ Drone demonstration
◊ Over 140,000 trees planted, representing 21 species  ◊ Walking tour with Dr. James Bissell of the Cleveland Museum of Natural History
◊ Maple tubing/sap production  ◊ Kids activities
◊ Wetland construction/ WRP  ◊ Various conservation organization displays
◊ Bridge construction  ◊ Invasive plant control

This event will take place rain or shine! Hiking footwear required!
Fairly level terrain. Food and beverages available for purchase.

GPS Location (parking): 41.752243, -80.567792
Additional information: 614-309-6096
RSVP’s appreciated: ohiotreefarm2019@gmail.com
**Make a weekend of it!**

Come visit Ashtabula County—Ohio’s best perch, walleye and steelhead fishing. Explore our 23 wineries, 19 covered bridges and 4 scenic rivers. Check out more at www.VisitAshtabulaCounty.com for lodging and reservations.
Tree Identification: Ashtabula County

Friday, September 27th, 10 a.m. to 12 p.m.

Garrett Ormiston and Trish Fox from the Cleveland Museum of Natural History will be presenting on Tree ID. The class will be in two parts starting at the Ashtabula County District Library at 4335 Park Avenue in Ashtabula. They will focus on identifying trees by examining characteristics of leaves, flowers, fruit, bark and more. Various books, from simple dichotomous keys to botanical resources will be used. The class will then travel individually to the site of Indian Trails Park under the Smolen Gulf bridge, the longest covered bridge in America along the Ashtabula river. Here we will learn to apply what we learned in the classroom to identify the many native trees of Ohio.

Locations:
ACDL - 4335 Park Avenue, Ashtabula, OH 44004
Smolen Gulf Bridge - 7001 State Road, Ashtabula, OH 44004

Cost: Free

Details: Rain or shine, personal transportation required

Contact information: Call OSU Extension – Ashtabula at 440-576-9008 for more information