CFAES

OHIO STATE UNIVERSITY EXTENSION

NORTHEAST OHIO AGRI-CULTURE NEWSLETTER

Your Weekly Agriculture Update for Ashtabula, Portage and Trumbull Counties

June 14, 2022

Thank you for joining as at our Small Grains Field Day!

In This Issue:

Hello Northeast Ohio Counties!

Thanks again to all who participated and taught at our Small Grains Field Night.

Do you need or know someone that needs a Fertilizer License? We are holding a 3-hour FACT session next Wednesday from 9AM-12PM in Portage County. (See flyer below for more details.)

We have a few hot days ahead of us so be sure to stay hydrated!

Stay safe and have a great week!

Lee Beers
Trumbull County
Extension Educator

Andrew Holden
Ashtabula County
Extension Educator

Angie Arnold
Portage County
Extension Educator

Corn Growth and Development: Crop Staging

By: Osler Ortez, Alexander Lindsey
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2022-18/corn-growth-and-development-crop-staging

One of the bottom-line activities in growing crops should be understanding and keeping track of crop growth and development. Crop ***growth*** is related to the increase in ***size.*** It is influenced by factors such as temperatures, water availability, stress, competition, and fertility. Crop ***development*** relates to the progress in ***stages***, and temperatures primarily drive it.

Corn plants are first staged as vegetative (from emergence to tasseling) and then reproductive (from silking to physiological maturity). These vegetative or reproductive stages are assigned on a field basis when more than half of a subsample of plants are at the same stage. Despite different staging methods exist (e.g., horizontal leaf and leaf tip), the recommended is the Leaf Collar method for vegetative stages (V) and indicators of kernel development for reproductive stages (R) [**Table 1**].

Table 1. Vegetative and Reproductive Stages for corn. Adapted from Abendroth et al., 2011.

STAGES		**COMMON NAME**
Vegetative	**VE**	Emergence
	V1	First Collared Leaf
	V2	Second Collared Leaf
	V3	Third Collared Leaf
	…	…
	Vn	nth Leaf

	VT	Tasseling
Reproductive	**R1**	Silking
	R2	Blister
	R3	Milk
	R4	Dough
	R5	Dent
	R6	Physiological Maturity

When it comes to crop management, one should focus on development as a more precise crop reference instead of growth. At later vegetative stages (after V10), younger leaves have often senesced, and the split-stalk approach may need to be taken to accurately stage plants (i.e., plants do not stay at the V12 stage until tasseling). This video shows staging using the split-stalk technique.

From planting to physiological maturity, plant structures initiate and grow at different stages (**Figure 1**). In the case of modern hybrids, it is common to see silks emerge (R1) before tassels fully emerged (VT) as this can improve pollination. Adverse conditions such as drought, heat, off label applications during any of these processes can negatively impact the crop and ultimately affect yields.

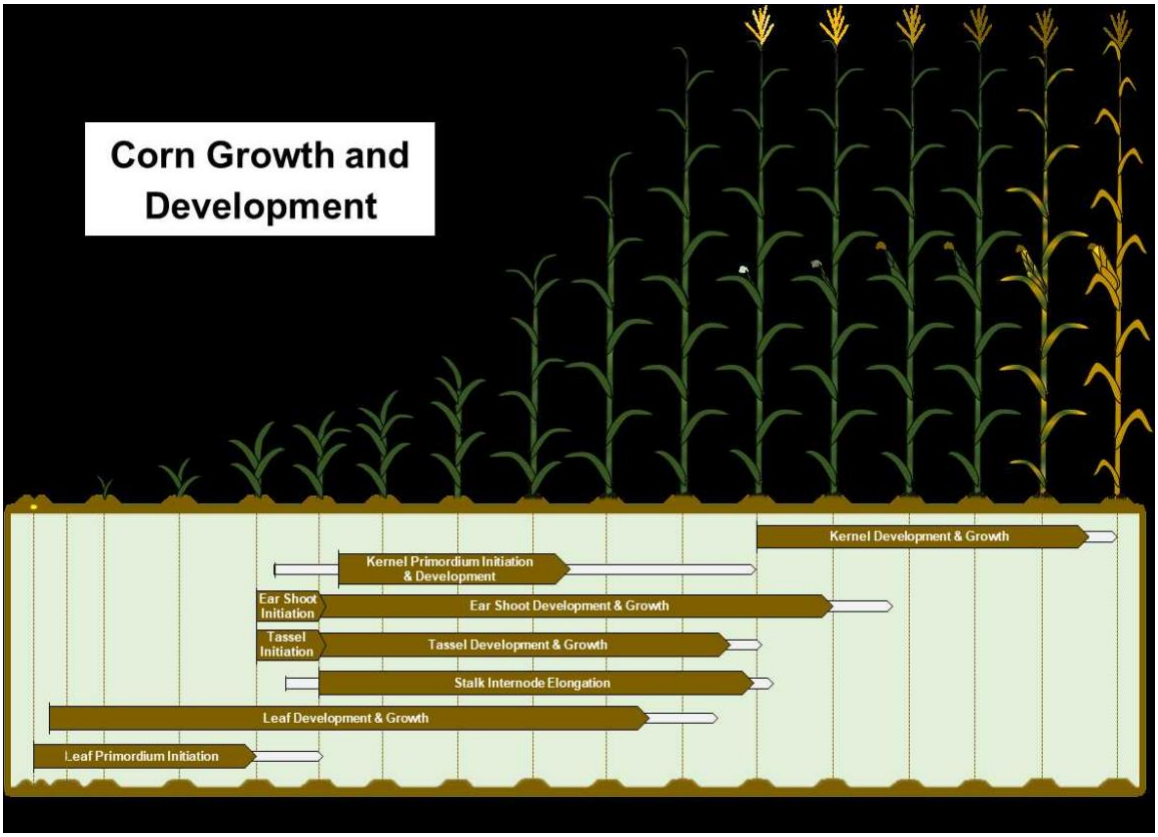

Figure 1. Corn growth and development from planting and germination (G) to physiological maturity (R6). Brown arrows indicate the primary period, and gray arrows indicate possible variations for each event. Source: Ortez et al., 2022 (*Crop, Forage & Turfgrass Management,* accepted, in production).

An adequate understanding of stages in corn is essential when planning different activities in the growing season—for example, fertilizer, herbicide, insecticide, and fungicide applications. Additionally, a good follow-through of corn staging can help understand when critical events occur, for example, drought stress linked to a reduction in kernel fill (i.e., kernel weight) towards the end of the season.

References:

Abendroth, L. J., R. W. Elmore, M. J. Boyer, & S. K. Marlay. (2011). Corn Growth and Development. PMR 1009. Iowa State University Extension, Ames, Iowa. https://store.extension.iastate.edu/product/Corn-Growth-and-Development.

Ortez, O., A. J. McMechan, T. Hoegemeyer, I. A. Ciampitti, R. L. Nielsen, P. Thomison, L. J. Abendroth, & R. W. Elmore. (2022). Conditions Potentially Affecting Corn Ear Formation, Yield, and Abnormal Ears: a Review. *Crop, Forage & Turfgrass Management Journal* (accepted, in production).

Double Crop Soybeans Production in Northern Ohio

By: Laura Lindsey, Eric Richer, CCA, Alexander Lindsey, Greg McGlinch
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2022-18/double-crop-soybean-production-northern-ohio

In northern Ohio, double-crop soybean production after wheat harvest needs to be carefully considered. There are both agronomic considerations (Do I have enough time and moisture to produce a soybean crop?) as well as economic considerations (Will my double-crop soybeans be profitable?). Profitability depends on soybean yield and price as well as the cost of inputs and field operations.

At the Northwest Agricultural Research Station, we compared full-season soybean (soybean only), relay-intercropped soybean (soybean intercropped into wheat), and double-crop soybean following wheat harvest (Figure 1). Across the three years of the study, soybean yield was greatest for a full-season crop (average of 57 bu/acre) and lowest for a double-crop soybean (average of 20 bu/acre). Relay-intercropped soybean yield fell in the middle with an average yield of 34 bu/acre. In 2016, soybean yield as an intercrop and double-crop were extremely low (17 and 12 bu/acre, respectively) due to hot, dry conditions that year.)

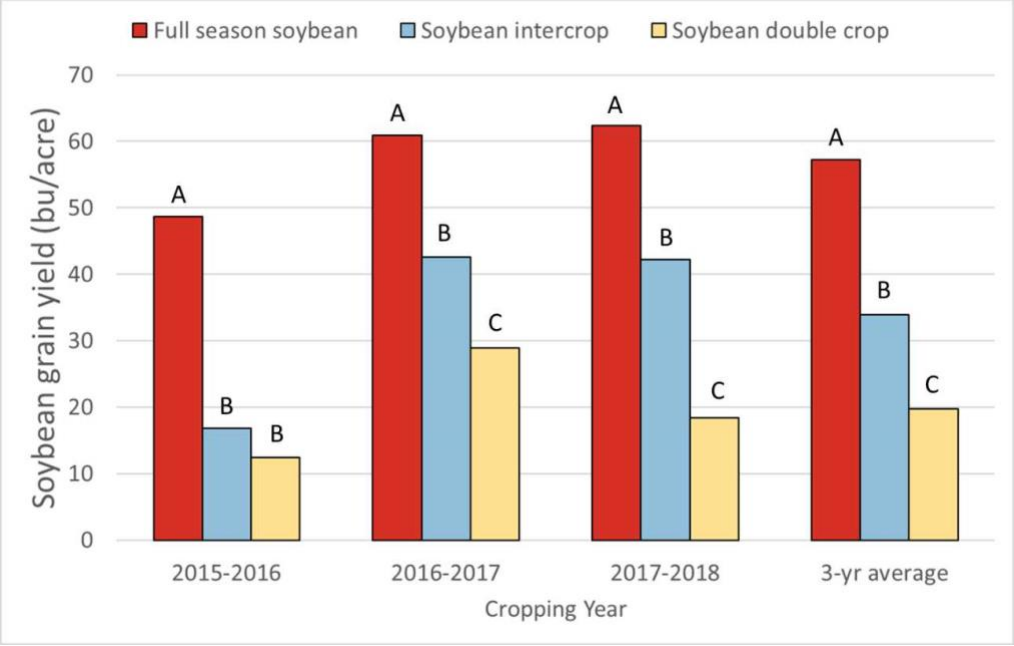

Figure 1. Soybean grain yield when grown as a full-season crop, a relay intercrop, and a double-crop at the Northwest Agricultural Research Station near Custar,

Ohio. (Click here to read more about this study: https://ohioline.osu.edu/factsheet/anr-100).

While this assessment looks only at the soybean component, the profitability of the entire cropping year (wheat +soybean) may be desirable to consider when making double-cropping decisions. The profitability of these various production systems can be extremely variable depending on input, field operation, and commodity prices. We developed an excel-based calculator to help estimate profitability (https://stepupsoy.osu.edu/wheat-production/wheat-profitability-calculator). The calculator can be used to estimate a partial return of six different production systems:

1. Winter wheat only
2. Winter wheat + straw
3. Full-season soybean (soybean only)
4. Winter wheat (grown in 15-inch row width) with soybean intercropped
5. Winter wheat followed by double-crop soybean
6. Winter wheat + straw followed by double-crop soybean

This calculator uses default values for crop prices, input prices, field operation costs, and projected crop yield from OSU Enterprise Budgets, OSU Custom Rate Survey, and OSU field research to compare the partial return of these six production systems. However, next to each default value, you can put in your production prices and costs to customize to your farming operation. Based on our calculator's 2022 default values, the gross return, costs per acre, and partial returns are printed in the table below.

Table 1. Partial return comparisons of six cropping systems. Default values are based on OSU Enterprise Budgets, OSU Custom Rate Survey, and OSU field research. Download the spreadsheet to edit with your values: https://stepupsoy.osu.edu/wheat-production/wheat-profitability-calculator

	DEFAULT VALUES			
		Gross Return per acre	**Costs**	**Partial Return**
1	**Wheat only (7.5-inch row width)**	$698	$266	$432

2	**Wheat only (7.5-inch row width) + straw**	$956	$279	$676
3	**Full season soybean**	$809	$187	$622
4	**Wheat (15-inch row width) with soy intercropped**	$1,023	$405	$618
5	**Wheat (7.5-inch row width) with soy double-crop**	$982	$413	$568
6	**Wheat (7.5-inch row width) with soy double-crop + straw**	$1,240	$427	$813

The research used to produce this calculator tool was generously funded by Ohio Corn and Wheat.

Hay Barn Fires a Real Hazard

By: Jason Hartschuh, CCA, Allen Gahler, Mark Sulc,
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2022-17/hay-barn-fires-real-hazard

Mother nature has been at it again, hardly giving us enough days to make dry hay with a risk of pop-up showers every afternoon. These conditions are very dangerous for hay producers since wet hay doesn't just rot it may also burn. Hay fires are caused when bacteria in wet hay create so much heat that the hay spontaneously combusts in the presence of oxygen. At over 20% moisture mesophilic bacteria release heat-causing temperature to rise between 130°F to 140ºF with the temperature staying high for up to 40 days. As temperatures rise thermophilic bacteria can take off in your hay and raise the temperature into the fire danger zone of over 175°F.

Assessing your risk

If the hay was baled between 15-20% moisture and acid preservatives were used there is still potential for a hay fire but not as great as on non-treated hay. Having a moisture tester on your baler can help you know the variability across your field in moisture and when to use hay preservatives. Without a moisture tester, you find darker green damp spots occasionally, or if humidity is high be sure to monitor for heating. Most propionic acid-based products are effective if applied at the correct rates at inhibiting bacteria growth in hay up to 25% moisture, with variable effectiveness at 25-30% moisture.

Temperature Assessment

Temperature (°F/ °C)	Action
125°/51.6°	No Action needed
150°/65.6°	Hay is entering the danger zone, check temperatures twice per day. Disassemble haystacks moving bales outside to allow air circulation to cool the hay.
160°/71.1°	Hay has reached the danger zone. Carefully check the hay temperature every few hours. Disassemble stacked hay to promote air circulation to cool hay be very careful of even hotter spots. Have a tank of water present while unstacking.
175-190°/79.4-87.8°	Hot spots or fire pockets are likely. Alert fire service to the possible hay fire incident. Close barns to minimize air movement around the hay. With the assistance of the fire service, remove hot hay. Be aware that bales may burst into flames, and keep tractors wet so the tractor does not catch fire.
200°+/93.3°+	Fire is present within the haystack near the temperature probe. With the assistance of the fire service, remove hot hay. If possible, inject water into the hot spot to cool the hay before moving. Most likely a fire will occur, keep tractors wet and fire hose lines charged in the barn and along the route of where bales will be stacked.

Monitoring the haystack

There are a couple of options available to monitor hay temperature. One of these is high technology, like the cables that can be used to monitor the temperature in stored grain. There are a couple of companies that produce cables that would be placed between bales in a stack or monitoring probes that are placed in bales and use radio frequency to transmit signals.

If you believe that you may be at risk for hay heating, monitoring temperature is critical. It should be done daily until temperatures stabilize in the safe zone or reach 150°F when monitoring needs to be increased too twice daily. This can be done with technology or manual temperature probes. When monitoring hay temperature, be very cautious, hot hay can burn within the stack and cause cavities underneath that you can fall into. Use planks to spread out your weight while walking on the stack and have a harness system attached to the ceiling in case you fall into a burned-out cavity. Also, work in pairs with someone on the ground within voice range to assist you if you find yourself in a bad situation. Temperature monitoring should continue for possibly six weeks until values stabilize in the safe zone.

Temperature monitoring depends on the stack size but should be taken close to the center of the stack. In larger stacks ideally, this is 8 feet down in the stack. This can be done by purchasing a long probe thermometer or building your own. Building your own can be done with a 3/8-3/4 piece of pipe or electrical conduit cut into a closed point. The pipe size will depend on the thermometer probe size you will put in the pipe. A larger pipe can be used and a thermometer on a string is lowered into the pipe. Drill 3/16-inch holes in the bottom four feet of the pipe. Leave the thermometer in the stack for about 10 minutes to get an accurate reading. A less accurate method is to leave a pipe in the stack all day, and if a section is too hot to hold in your hand when removed you are at risk for fire. Or even better use an infrared thermometer to measure the temperature of the pipe. Any time temperatures are above 175ºF hay should not be removed from the barn until the local fire department is present, you are at risk for fire. Once the fire department is present hay should be carefully removed from the barn with charged fire hoses ready if spontaneous combustion occurs. Have a safe and well-drying hay season this year!

Tracking Weeds to Stop Them in Their Tracks

By: Eric Hamilton
Source: https://www.agronomy.org/news/science-news/tracking-weeds-stop-them-their-tracks

Not that long ago, weeds spread at a much slower rate. Seeds would spread to nearby soil and move perhaps a few feet each year or would be transplanted by birds who flew with them several miles away. In today's interconnected world, though, weeds can hitch a ride on a truck, boat, or even an airplane. What once might've taken generations to spread weeds from one region to another now takes no time at all.

Figure 1. *The image shows Palmer amaranth seeds that were sorted from dairy cow manure relative to a laboratory scoop to show how small the seeds are. Palmer amaranth seeds that contaminate feed will end up in manure. When the manure is spread on fields as fertilizer, the seeds will grow into harmful weeds. Credit: Luis Allen*

This can be unwelcome news for farmers and consumers, who may not want to pay higher prices for the costs of weed control. Lately, one of those nuisances spreading farther than before is Palmer amaranth. One way it spreads is by contaminating livestock feed.

"Palmer amaranth is an aggressive weed that can cause significant reductions in crop yield if it is not controlled. Recently, it has been making its way into the Upper Midwest where it wasn't previously established," says Melissa Wilson, professor of manure management at the University of Minnesota. One of her lab's goals is to track the spread of weeds like Palmer amaranth to stop it in its tracks.

The study was published in Agricultural & Environmental Letters Journal, a publication of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America.

Manure, it turns out, is the perfect tool for this investigation. Palmer amaranth seeds that contaminate feed will end up in manure, and when that manure is spread on fields as fertilizer, those seeds will grow into harmful weeds. Wilson's team focused on how best to test manure for weed seeds. "If feed is suspected to be contaminated with Palmer amaranth seeds, testing it directly is definitely easier!" says Wilson. "In some cases, feed may have already been given to livestock after the supplier found out the source may have been contaminated. If the feed is already gone, this only leaves the manure for testing."

Figure 2. *Palmer amaranth is an aggressive weed that can cause significant reductions in crop yield if it is not controlled. One Palmer amaranth seed is shown at the end of the lab scoop and is surrounded by the material in dried cow manure. The small size of these seeds makes it difficult to find and separate them from soil and manure. Credit: Luis Allen.*

Manure is a complex substance, so separating tiny seeds from it is tricky. The researchers tested six different methods. They all involved passing the manure through fine sieves to catch the seeds. The scientists also tested manure with or without straw bedding. The best method turned out to be rinsing the manure through the sieves with water. "We found that agitation from running water helped dislodge seeds that were caught in solids or in the sieves," says Wilson. They recovered 90 percent of seeds this way, with or without straw bedding. They were then able to genetically test the seeds to confirm they were Palmer amaranth. That genetic test avoided the lengthy process of growing the seeds to identify their species.

"If farmers suspect that their livestock have been fed contaminated feed, we now have a simple and quick way to test the manure. This will allow them to make appropriate management decisions more rapidly including manure treatment, like composting," says Wilson.

Although most consumers are happy not to be a part of the manure/seed separation process, they should see the benefit of this work, too. That's because any work that helps farmers use manure responsibly is good for the whole food system. "Livestock manure is a great resource for crop production. It provides nutrients and can help improve soil health. But there are drawbacks, including the risk of weed seeds! Our research is helping to reduce the spread of a particularly invasive weed in the Upper Midwest," says Wilson.

Figure 3. *To aid in sorting Palmer amaranth seeds from manure, Wilson and her team tried several methods. One method included using an oven to dry slurry manure (on the right) as well as a straw-bedded pack (on the left) contaminated with Palmer amaranth seeds. Manure is a complex substance, so separating tiny seeds from it is tricky. Credit: Luis Allen.*

Upcoming Extension Programs

The following programs have been scheduled for NE Ohio farmers. Check back each week as more programs are added to the calendar

Cheese Making Basics with Demo – Portage County Fair Grounds- Dinning Hall
June 18th, 2022 10AM-12PM – 20 Person Limit

FACT 3 Hour Session – Portage County Extension Office
June 22th, 2022 9AM-12PM

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Lee Beers
Trumbull County Extension
520 West Main Street
Cortland, OH 44410
330-638-6783
beers.66@osu.edu
trumbull.osu.edu

Andrew Holden
Ashtabula County Extension
39 Wall Street
Jefferson, OH 44047
440-576-9008
holden.155@osu.edu
ashtabula.osu.edu

Angie Arnold
Portage County Extension
705 Oakwood St., Suite 103
Ravenna, OH 44266
330-296-6432
arnold.1143@osu.edu
portage.osu.edu

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: http://go.osu.edu/cfaesdiversity.

Cheese Making Workshop & Demo

Say Cheese! Ever wanted to try your hand at home cheesemaking? Join Abbe Turner of Lucky Penny Farm to learn the tricks of the trade for making delicious cheeses at home. A simple ricotta will be made along with a demo on edible flowers, cheese boards, and elegant appetizers for summer entertaining. Samples provided; all questions answered. Class size is limited for personal attention.

DATES: Saturday, June 18th, 2022
TIME: 10AM-12PM
LOCATION: Portage County Fairgrounds-Dining Hall
4215 Fairgrounds Rd, Atwater, OH 44201
COST: $35

To register: Scan the QR code, go to
https://go.osu.edu/portagecheesemaking
or call the Portage County Extension Office at 330-296-6432.

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Portage.osu.edu
We Sustain Life

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.

CFAES

OHIO STATE UNIVERSITY EXTENSION

Fertilizer Applicator Certification Training

June 22, 2022 9 A.M. – 12 P.M.

Do you apply fertilizer to 50 acres or more for crops that are primarily for sale? If so, you are required by Ohio law to attend a training session or take a test to become certified. OSU Extension Portage County is offering a training session (no test) that will meet all certification requirements. **Pre-Registration is required a week in advance.** Cost for this training session is $35/person and includes training materials, and handouts. To register online with a credit or debit card please visit https://go.osu.edu/portagefertilizer2022. You can also register by completing the back portion of this flyer and mail with check to the address below. Please make checks payable to OSU Extension

Location: OSU Extension Portage County, 705 Oakwood St., Suite 103, Ravenna, OH 44266

Cost: $35/person

Contact information: 330-296-6432 or arnold.1143@osu.edu

portage.osu.edu

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.

CFAES OHIO STATE UNIVERSITY EXTENSION

2022 Fertilizer Applicator Training
Portage County

Name _____

Address _____

City _____ State_____ Zip_____

Phone _____Email _____

Number of People Attending: _____ X $35/person _____

_____

Please make checks payable to: **OSU Extension**

OSU Extension Portage County, 705 Oakwood St., Suite 103, Ravenna, OH 44266

For questions, contact Angie Arnold at 330-296-6432 or by email at arnold.1143@osu.edu

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

CF A E S provides research and related educational programs to clientele on a nondiscriminatory basis. F or more information: go.osu.edu/cfaesdiversity

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

CFAES

2022 Northeast Ohio Pollinator Summer Festival

DATE: Saturday, June 25th, 2022 **TIME: 8:00 AM to 4:00 PM**
LOCATION: Gateway Elementary School Auditorium & Outdoor Learning Center, 229 Gateway Avenue, Conneaut, Ohio 44030

Join us for a day of pollinator education and celebration in beautiful Conneaut, Ohio. The 2022 Northeast Ohio Pollinator Summer Symposium is an all-day pollinator focused event that will feature a variety of speakers, tours, and vendors. The morning sessions will cost $10 to attend and feature two speakers, Michele Colopy, Executive Director and co-founder of LEAD for Pollinators, and Debra Knapke, author, public speaker and garden consultant known as "The Garden Sage". The afternoon session will be free to the public and offer many different activities, learning opportunities, networking, and vendors. So far, the afternoon will include Native Plant Vendors, Nature Organizations, Guided Tours, Guided Hikes, Kids Activities, Tree Planting demos, Native Tree Giveaways, Musical performances from The Nurseryman Band & Pickle Milk, and local Food Trucks, with more to come!

The Northeast Ohio Pollinator Symposium is a combined effort of the Ashtabula Soil and Water Conservation District, Ashtabula County Master Gardeners, Ashtabula County Beekeepers Association, and OSU Extension of Ashtabula County.

We will have water stations, so bring your reusable water bottle

For more information or to sign up, visit **www.go.osu.edu/neops**

THE OHIO STATE UNIVERSITY EXTENSION

Ashtabula County Beekeepers Association

Ashtabula Soil & Water Conservation District

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis.
For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

CFAES

2022 Northeast Ohio Pollinator Summer Festival Schedule

DATE: **Saturday, June 25th, 2022** **TIME:** **8:00 AM to 4:00 PM**
LOCATION: **Gateway Elementary School Auditorium & Outdoor Learning Center, 229 Gateway Avenue, Conneaut, Ohio 44030**

Morning Session ($10 Admission)

8:00-8:30 – Registration and Check-In $10 Admission if attending morning presentations.

8:30-10:00 – Michele Colopy, Executive Director and co-founder of LEAD for Pollinators,
'Understanding the Pollinator Crisis and How You Can Help'
From the four "p's" impacting honeybee health to deciphering fact from fiction, you will learn how you can take action to support managed and native pollinators vital to a sustainable agricultural and environmental landscape.

10-10:30 – Break

10:30-12:00 – Debra Knapke, author, public speaker and garden consultant known as "The Garden Sage,"
'Gardening for Pollinators by Season'
Our garden pollinators – bees, butterflies, and more – are threatened on many fronts. We know that they only thrive if they have a constant food source: the right flowers at the right times. Debra will offer strategies to help you give pollinators what they need to survive and flourish.

Afternoon Session (Free to attend)

12:00 to 4:00 – Celebration of pollinators at the Outdoor Learning Center

- Native Plant Vendors – Over 10 of Ohio's best nurseries will be selling quality trees, shrubs, and perennials
- Nature Organizations and Exhibitors promoting their organizations
- Guided Tours of the award-winning Outdoor Learning Center Butterfly & Pollinator Garden
- Guided Hikes led by the area's finest naturalists
- Kids Activities led by local non-profit service groups
- Tree Planting Demonstration for homeowners
- Native tree giveaway courtesy Ashtabula County Soil & Water
- Musical Groups including The Nurseryman Band & Pickle Milk
- Food Trucks will be available for lunch

We will have water stations, so bring your reusable water bottle

To attend the morning session please register on our website (Registration opens April 1st).
If attending the free afternoon session, please RSVP on our website (Not needed if attending morning session).

www.go.osu.edu/neops

THE OHIO STATE UNIVERSITY EXTENSION

Ashtabula County Beekeepers Association

Ashtabula Soil & Water Conservation District

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis.
For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.

CFAES

Ohio State University Extension

Do you have a home, yard, or garden question?
Need expert advice but don't know where to turn?

Call the Ashtabula County Master Gardener Hotline!

Starting May 2nd until October 31st

Every Monday, 9 AM to Noon and every Thursday, 1 PM to 4 PM

To contact the Hotline, call **440-576-9008**

Call during listed hours to speak with a volunteer or call anytime and leave a message. The hotline can be also be reached via email at Ashtabula.1@osu.edu and in person by stopping in at the Ashtabula OSU Extension Office – 39 Wall St. Jefferson, Ohio 44047.

For your home horticultural question call the Master Gardener Hotline today!

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

GARDENING TIPS