

Morrow County SCARLET & GRAY News

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Update on Highly Pathogenic Avian Influenza in the USA

Highly Pathogenic Eurasian H5 avian influenza was recently found in wild birds in South & North Carolina. The species it was discovered in are migratory waterfowl.

Because migratory waterfowl in South and North Carolina or birds they encounter migrate through Ohio, precautions should be taken to prevent the potential exposure of both the commercial poultry industry and backyard poultry community birds to high path avian influenza.

Biosecurity for backyard poultry includes preventing wild birds from mingling with the flock. Preventative measures include ensuring your domestic birds cannot access areas migrating birds may visit, such as ponds, puddles, other open water sources, pastures, fields, etc. Prevent interaction with other wild birds in your flock using fencing or bird netting. The aim is to keep your domestic birds from encountering migratory waterfowl.

The Ohio Department of Agriculture's Animal Disease Diagnostic Laboratory (ADDL) will test for high path avian influenza in birds suspected of being infected. Necropsy specimens should be submitted via a vet. See <https://vet.osu.edu/extension/poultry-resources> for a list of vets who see poultry in Ohio.

Source new birds from reputable sources such as an NPIP approved hatchery.

Please take biosecurity seriously!! Please watch and share the Biosecurity for Backyard Poultry short video created with The Ohio Poultry Association. <https://www.youtube.com/watch?v=bXFYCy2zvU>

USDA APHIS issued the following update on this topic on January 18, 2022:

WASHINGTON, January 18, 2022 – The United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has confirmed two additional findings of highly pathogenic avian influenza (HPAI) in wild birds – one in Colleton County, South Carolina and one in Hyde County, North Carolina. These finds follow confirmation on January 14, 2022 of HPAI in a wild bird in Colleton County, South Carolina. All three findings are H5N1 HPAI.

These findings are not unexpected, as wild birds can be infected with HPAI and show no signs of illness. They can carry the disease to new areas when migrating. APHIS anticipates additional wild bird findings as our robust wild bird sampling program continues into the spring.

APHIS will post these and all future wild bird find-



ings on its website on a weekly basis. Stakeholders should check the website on a routine basis, as no future stakeholder announcements are planned for wild bird findings.

Since wild birds can be infected with these viruses without appearing sick, people should minimize direct contact with wild birds by using gloves. If contact occurs, wash your hands with soap and water, and change clothing before having any contact with healthy domestic poultry and birds. Hunters should dress game birds in the field whenever possible and practice good biosecurity to prevent any potential disease spread. Biosecurity information is available at https://www.aphis.usda.gov/publications/animal_health/2015/fsc_hpai_hunters.pdf

Given these additional findings, anyone involved with poultry – commercial or backyard flocks alike – should review their biosecurity plan and enhance their biosecurity practices to assure the health of their birds. APHIS has materials about biosecurity, including videos, checklists, and a toolkit available for producers on our website.

In addition to practicing good biosecurity, all bird owners should prevent contact between their birds and wild birds and report sick birds or unusual bird deaths to State/Federal officials, either through their state veterinarian or through USDA's toll-free number at 1-866-536-7593. Additional information on biosecurity for backyard flocks can be found at <http://healthybirds.aphis.usda.gov>.

Morrow County 4-H is for you!

Joining a 4-H Club -

4-H Clubs are located all over Morrow County! Each club decides the best place and time to meet. Go to the link below for a list of our 4-H clubs.

Enrollment deadline is April 30.

Youth must be in third grade and at least 8 years old by January 1 OR 9 years old by January 1, any grade level.

4-H Projects -

As a 4-H member, you will choose a project based on your interests. Your project is like a hobby that you work on and learn about the fun way - by doing!

See the hundreds of projects in the 4-H Family Guide of projects found at the QR Code.

Opportunities Available to 4-H Members -

Along with joining a club and completing 4-H projects, 4-H members have other opportunities:

- Exhibiting your project at the Morrow County Fair
- Attending 4-H Camp!
- Project Clinics, Workshops, Teen Leadership Opportunities and Conferences.

To find a club or to get more information, go to <http://go.osu.edu/howtojoinmorrow4h>, or call the OSU Extension Office at 419-947-1070, or use the QR Code.



Current Resident or

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TABLE OF CONTENTS

- Agricultural NewsPages 2-6
- 4-H News.....Pages 6-9
- Family & Consumer SciencesPages 10-11
- Calendar of EventsPage 12

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AGRICULTURE

4-H NEWS



Summer Intern/Student Worker Wanted

OSU Extension – Morrow County is looking for a summer intern to help in the area of Agriculture and Natural Resources. This summer intern would work 38 hours a week and complete a variety of tasks.

The tasks would include but are not limited to: monitoring and identifying pollinators that visit the native pollinator research gardens, maintenance of the native pollinator gardens, creating an educational video and signage about the native pollinator research gardens; updating the local foods list and visiting several of those local food producers to create a video featuring them;

helping with agronomy research plots and other agronomy related activities throughout the summer; assist the educator with local farm visits.

This position might also include helping the other extension educators and office associates in our office with various projects throughout the summer. Please follow this link to apply: <https://go.osu.edu/mo-coextsummer2022>



What's ahead for legal issues in 2022?

By Peggy Kirk Hall, Associate Professor, Agricultural & Resource Law

We've quickly reached the end of January, and several of the legal issues I've talked about in OSU's "Agricultural Outlook" meetings have surfaced this month. If the current pace keeps up, 2022 promises to be a busy year for agricultural law. Here's a review of three legal issues I predict we'll see that have already begun to emerge in 2022.

Water, water. From defining WOTUS to addressing Lake Erie water quality, water law will continue to be everywhere this year. The U.S. Supreme Court just announced on January 24 that it will hear the well-known case of *Sackett v EPA* to review whether the Ninth Circuit Court of Appeals used the proper test to determine whether wetlands are "waters of the United States" (WOTUS). The case is one example of the ongoing push-pull in the WOTUS definition, which establishes waters that are subject to the federal Clean Water Act. The Biden administration proposed a new WOTUS rule last December that would replace the Trump-era rule, and comments remain open on that definition until February 7. Ohio has wrangled with its own water issues, particularly with agricultural nutrient impacts on water quality. We'll see this year if the state will continue to rely on H2Ohio and similar incentive-based programs and whether the Ohio EPA will face additional litigation over its development of a Total Maximum Daily Load for Lake Erie.

Pesticide challenges. The EPA announced a new policy on January 11 to more closely evaluate potential effects of pesticide active ingredients on endangered species and critical habitats. That was the same day the agency re-registered Enlist One and Enlist Duo pesticides, but with new label restrictions and prohibited use in hundreds of counties across the U.S., including a

dozen Ohio counties. An EPA report documenting dicamba damage in 2021 could form the basis for yet another lawsuit this year demanding that EPA vacate dicamba's registration. Meanwhile, we await a decision by the U.S. Supreme Court on whether it will review *Hardeman v. Monsanto*, one of dozens of cases awarding damages against Monsanto (now Bayer) for personal injury harms caused by glyphosate.

Opposition to livestock production practices. Ohio pork producers watching California's Proposition 12 will be happy with a recent California court decision prohibiting enforcement of one part of the law that went into effect on January 1. The provision requires any pork and eggs sold in the state to be from breeding pigs and laying hens that are not raised in a "cruel manner," meaning that the animals have a certain amount of usable pen space. The California court agreed with grocers and other retailers that the law could not be enforced on sales of pork meat because the state hasn't yet finalized its regulations. The law could be subject to further scrutiny from a higher court. Several agricultural organizations have unsuccessfully challenged the law as a violation of the Constitution's Commerce Clause, but one of those cases currently awaits a decision from the U.S. Supreme Court on whether it will review the case. Other livestock production issues we'll see this year include continued battles over Right to Farm laws that limit nuisance lawsuits against farms, and challenges to "ag gag" laws that aim to prevent or punish undercover investigations on farms.

There's more to come. Watch for more of our predictions on what 2022 may bring to the agricultural law arena in upcoming posts. Or drop into one of our Agricultural Outlook and Policy meetings to hear my Ag Law Outlook. As quickly as the year is moving, we'll soon know how many of those predictions are correct.

4-H General Information

Project Enrollment for 4-H and FFA Members and Showing Animals at the State Fair

4-H members must be enrolled in their county in the project in which they enter to show at the Ohio State Fair Junior Livestock Shows (including poultry, rabbits, and dogs), regardless of whether that project is offered for county exhibition.

- (1) For example: To show in a gilt class at the Ohio State Fair, youth must be enrolled in project 140 Swine Breeding Project and Record Book.
- (2) For example: To show a dairy feeder at the Ohio State Fair, youth must be enrolled in project 117DF Dairy Beef Feeder (Market);
- (3) For example: To show breeding poultry (chickens) at the Ohio State Fair, 4-H members must be enrolled in project 150CE, Exhibition Chickens; to show breeding poultry (ducks), they must be enrolled in project 150DE, Exhibition Ducks, and so forth.

(4) For example: To show a dog in agility at the Ohio State Fair, 4-H members must be enrolled in project 201P, Performance; to show the same dog in obedience, project 201O, Obedience, etc.

FFA members must enter to show at the Ohio State Fair the same animal project they are taking through their Supervised Agricultural Experience (SAE).

- (1) For example: To show a market lamb at the Ohio State Fair, FFA members must be taking market lambs as one of their Supervised Agricultural Experiences.
- (2) For example: To show a beef breeding heifer at the Ohio State Fair, FFA members must

be taking breeding beef as one of their Supervised Agricultural Experiences.

Note: The same animal cannot be enrolled in two projects in the county (exception dog projects and 4-H PetPALS), with the youth planning to enter one or the other project at the Ohio State Fair. Decisions must be made by project enrollment deadline or county's animal identification deadline (whichever comes first).

- (1) For example: A youth is not permitted to enroll the same beef animal in a breeding project (117B Beef Breeding) AND in a market project (117M Market Beef).
- (2) For example: A youth is not permitted to enroll the same rabbit in a pet rabbit project (Pet Rabbit Project and Record Book 227) AND in a breeding rabbit project (Breeding Rabbit Project and Record Book 225). She/he must choose which project in which to enroll that animal by county deadlines for that species.

(3) Exception dog projects: For example: Youth may enroll the same dog in multiple dog projects such as in You and Your Dog (201D); Obedience (201O); Performance (201P) and Showmanship (201S) provided that dog can perform the required exercises of each project at the Ohio State Fair.

(4) Exception: 4-H PetPALS: Youth may enroll in a pet rabbit project (225) and 4-H PetPALS (230), or 150CE Exhibition Chickens and 230 4-H PetPALS, etc. with the same animal.

Questions? Call Becky Barker at 419-947-1070.

Pork Producer's Scholarship & Ambassador Info

The Morrow County Pork Producers has a scholarship available for qualified candidates. They also have an application to be the 2022 Pork Ambassador. Both applications are available at the website listed below or you can stop

in our office to pick them up. They are due by March 7th.

<https://morrow.osu.edu/program-areas/4-h-youth-development/ambassadorqueenking-princess-applications>

Youth Photography Workshop

May 7, 2022, 10:00 a.m. - 1:30 p.m.

For more information and to register, scan the QR code or go to go.osu.edu/starworkshops

AGRICULTURE

Upcoming OSU Agriculture and Horticulture Events:

Tuesday, March 15:

Beef Quality Assurance, Adults and Youth, 6:30 p.m. @ the Ag Credit Building

Thursday, March 17:

Seeds To Start Early, 10:30 a.m. @ Selover library in Chesterville

Wednesday, March 30:

Seed Starting Class, 2 p.m. @ Perry Cook Memorial library Johnsville

Thursday, March 31:

Seed Starting Class, 6 p.m. @ the Ag Credit Building

Tuesday, April 5:

Opening Up Your Garden, 6 p.m. @ Headwaters

Tuesday, April 12:

Growing Your Own Food, 6 p.m. @ Headwaters

Thursday, April 21:

Container Gardening, 10:30 a.m. @ Selover library in Chesterville

Wednesday, April 27:

Companion Planting, 2 p.m. @ Perry Cook Memorial library Johnsville

Monday, May 2:

Plant Swap with Selover Library, 6:30 in Chesterville

Tuesday, May 10:

Hanging Basket Make and Take with plants that attract hummingbirds, 6 p.m. @ Headwaters Cost: \$25.00

Thursday, May 12:

Plant Swap with Selover Library, 6:30 in Marengo

Wednesday, May 25:

Creating a Pollinator Garden with native perennials, 2:00 p.m. @ Perry Cook Memorial library Johnsville

Wednesday, June 22:

Common Garden Insects, 2:00 p.m. @ Perry Cook Memorial library Johnsville

Tuesday, June 28:

How to Enter Flowers in the Fair, 6 p.m. @ Headwaters

Thursday, July 21:

Herb Garden Make and Take, 6 p.m. @ Bunkers Mill Winery (July 28th is the rain date) Cost \$20.00

Wednesday, July 27:

Common Garden Diseases, 2 p.m. @ Perry Cook Memorial library Johnsville

Be On the Lookout for Spotted Lanternfly

By Carri J. Jagger, Ag & Natural Resources Educator, Morrow County

Spotted Lanternfly (SLF) was first discovered in Southeast Pennsylvania in 2014. It's a new non-native insect pest to the U.S. and is thought to be native to China, Japan, Vietnam and Taiwan. This invasive species preferred host is the Tree of Heaven (*Ailanthus altissima*) but it will also feed on a wide variety of plants throughout its life cycle. Spotted Lanternfly nymphs and adults have been found feeding on wild and domestic grapes, hops, fruit trees, willow, various hardwood trees, pines, shrubs and vines.

Spotted lanternfly made it's way to Jefferson County, Ohio in 2020, Cuyahoga County in 2021 and was found in Lorain County last week (February 10th, 2022). As you travel around Ohio keep an eye out for it. SLF looks like a butterfly



or moth but it is actually a planthopper. They have four wings and piercing-sucking mouthparts that are used to pierce their food source and suck out the nutritive fluids. The adults measure approximately 1 inch long and 1/2 inch wide at rest and 1 1/2 to 2 inches wide with wings spread. When the insect is at rest the wings are in a tent like position over the body and when the wings are fully open you can see the red, black and white markings.

The SLF has a one year life cycle as the adults lay eggs in late fall through the first freeze. They lay eggs on host plants or any flat surface in clusters of 30-50 eggs arranged in 4-7 columns. The columns of eggs which measure about 1 inch in length, are covered by the female with a mud like substance. The first egg hatch begins in early May and the SLF will go through 4 nymph stages before it completes it's life cycle.

Spotted lantern fly is not a strong flyer but is a great hitch hiker. Hitch hiking is how this pest is being spread. It likes rusty objects and travels



on railroad cars. In Jefferson and Cuyahoga counties SLF was found near rail roads.

If you see a Spotted Lantern Fly, please call OSU Extension - Morrow County 419-947-1070 or the Ohio Department of Agriculture 614-728-6400.

For more information: <https://ohioonline.edu/factsheet/anr-83>



Soybean Growers are Invited to Participate in a New Study to Improve Honey Bee and Soybean Productivity

By Laura Lindsey, Reed Johnson, Chia Lin

The corn-soybean cropping system dominates the landscape in much of the Midwest where one-third of US honey bee colonies reside. We are looking for soybean growers to help with a new study that will test whether a slightly different management strategy for soybeans can help support pollinators, improve honey production for beekeepers, and improve soil health while maximizing crop productivity.

This study was largely inspired by a pilot project led by Nate Douridas at the Molly Caren Agricultural Center, where a perennial wildflower mix was planted in low-yielding areas in a large field (see video "Turning Red Acres Green" <https://www.youtube.com/watch?v=Jp-PhLj-0Db0>). During soybean bloom last year, we observed lots of bees foraging on the wildflowers and on soybeans near the wildflower zones. We would like to further investigate how this management strategy, along with planting soybean varieties that are attractive to bees, could improve productivity in both honey bees and soybeans.

We are seeking large fields (100 acres or

more) with some existing low-yielding areas identified by yield monitor data that can be replaced with wildflowers (we will provide wildflower seed). Wildflowers may also be planted in border areas of the field. The experiment will continue for four years with the following schedule:

Year 1: plant wildflowers and a soybean variety of the grower's choice.

Year 2: plant corn. No change to the wildflower areas.

Year 3: plant a nectar-rich soybean variety. No change to the wildflower areas.

Year 4: remove wildflowers, plant a nectar-rich soybean variety in the entire field.

We will be working with the Ohio Soybean Performance Trials to identify a list of nectar-rich soybean varieties (data will be available by the end of 2022). We will also monitor the growth of four honey bee colonies installed at one edge of the field with an automated hive scale throughout the study period. We will evaluate the diversity of insect pollinators in the wildflower zones and adjacent soybeans during bloom. Yield monitor maps and pod evaluations (from a small set of



hand-harvested plants) will be compared to evaluate any yield benefits. Soil samples will be collected to determine how the perennial wildflowers affect soil properties.

You can also participate without the wildflower experiment by just planting nectar-rich soybean varieties and allowing us to collect insect and plant samples in the field and monitor honey bee colonies housed near the soybean field.

If you are interested in participating in this research, please contact Chia Lin (614-247-4780 or email Lin.724@osu.edu).

Considerations for managing P & K in 2022

By Greg LaBarge, CPAg/CCA,
Steve Culman

During this period of high prices and uncertain availability of phosphorus and potassium fertilizer, a few basic soil fertility concepts can help guide application decision-making. Fortunately, the work during 2014-2020 that led to the Tri-State Fertilizer Recommendation for Corn, Soybean, Wheat, and Alfalfa-2020 is current information we use. Here are a few key points from the Tri-States plus some other principles that may help.

1. Have a current soil test and use it.

What is the best investment when fertilizer prices are high, a recent reliable soil test? What is a recent reliable soil test? A recent soil test is no more than four years old. A reliable test is where you believe the number for pH, phosphorous, and potassium on the soil test represents that field you farm. If you question your soil report numbers, think about changing how you collect samples for soil testing. You want to consider three things: the size of the sampled area, does the sample area represent productivity and using a standardized sample depth. For more information on soil sample collection procedures, see the factsheet at <https://go.osu.edu/soilsample>.

Recent reliable soil test values for pH, phosphorus, and potassium will tell you if you need to apply lime or fertilizer this year or if we can wait. Comparing your soil test values to the Tri-State Fertilizer Recommendations will answer critical questions about your fertility needs. Get your copy of the Tri-state Fertilizer Recommendations for Corn, Soybean, Wheat, and Alfalfa at <https://go.osu.edu/fertilizer>. The publication is available for sale as a printed copy or a free pdf version.

2. Apply lime if needed

The first thing to look at on your soil test reports is pH. Soil pH is the critical factor in nutrient availability. If soil water pH is less than 6.0, consider liming before applying fertilizer. When soil pH values are acidic (< 6.0), the lime investment will make more soil stored phosphorus and potassium crop available. Use buffer pH from the soil test report to determine how much lime you need. Apply enough lime to bring soil pH into the 6.5-6.8 range. Spend your first fertilizer dollars on lime.

3. Suspend buildup P and K applications

Buildup nutrient recommendations are recommendations to increase below critical soil tests value and have no yield impact. The total recommendation shown in the Tri-State tables is crop removal plus and added buildup amount for any soil value below critical for the crop. Consider suspending this portion of the nutrient recommendation until we have more favorable fertilizer prices. Table 1 shows the critical soil test values for phosphorus and potassium.

4. Prioritize fertilizer application to soil test P and K areas below "critical" value

You have been using a build maintenance fertilization strategy if you have been following our Tri-state Fertilizer Recommendations for Corn,

Soybean, Wheat, and Alfalfa. The build maintain strategy has the pricing and availability situation we are currently experiencing in mind. Comparing your soil test value for phosphorus and potassium to the critical value defines the need for annual fertilizer application. The text from the Tri-State bulletin states, "Soil test values above the critical value are "optimal," unlikely to be responsive to fertilizer application. Soil test values below the critical value are "deficient," more likely to have a yield response to fertilizer application."

Shown in Table 1 are critical soil test values for phosphorus and potassium in corn, soybean, wheat, and alfalfa. In summary, with a build maintenance approach, as long as soil test values are above the critical value, you can defer fertilizer applications when fertilizer prices are high, or weather conditions do not favor application.

Table 1. Critical Soil Test Values from Mehlich 3 Soil Test for Phosphorus and Potassium. (Tri-state Fertilizer Recommendations for Corn, Soybean, Wheat, and Alfalfa, 2020.)

Crop	Phosphorus Mehlich 3	Potassium Mehlich 3	
		oils with CEC <5 meq/100g	Soils with CEC >5 meq/100g
Corn & Soybean	20	100	120
Wheat & Alfalfa	30	100	120

If your crop for 2022 is corn or soybeans, here is how it works. First, scan your soil test reports for less than 20 ppm P soil values. Below 20 ppm is where the risk of yield loss is more likely. Therefore, the recommendation would be to apply a crop removal rate of P. Determine yield potential based on-field productivity. Then multiply the yield potential by the crop removal P rate for the crop. Crop removal is 0.35 pounds P2O5 per bushel for corn, and soybean is 0.80 pounds P2O5 per bushel.

Here is an example. A field (or zone) with a soil test P-value of 15 ppm Mehlich 3, and corn yield is 195 bushels per acre. Therefore, the nutrient needed is 68 pounds P2O5, 195 multiplied by 0.35. The amount of MAP fertilizer required to meet this need is 131 pounds found by taking 68 pounds P2O5 needed dividing by 0.52, which is the P2O5 percentage of MAP, 11-52-0. If you are using DAP, it would be 148 pounds found by taking 68 pounds P2O5 needed dividing by 0.46, which is the P2O5 percentage of DAP, 18-46-0.

Where your soil test reports show soil P values above the 20 ppm critical value, you can defer fertilizer applications to when fertilizer prices are more favorable. However, keep in mind that if your soil test values are near the critical value, you can only defer for a short time. Soil test P values decline over time, but change is not dramatic from one year to the next due to the soil's ability to buffer available P. Estimated change in soil test P values is only 2-3 ppm per year from crop removal.

Decisions for potassium are similar to phosphorus. The difference is we need to look at both the Cation Exchange Capacity (CEC) number and the soil test potassium value. If CEC is less

than 5, use 100 ppm Mehlich as the critical value. If CEC is greater than 5, use the 120 ppm value. The crop removal for corn is 0.20 pounds of K2O per bushel, and for soybean, it is 1.15 pounds of K2O. Now scan your soil test reports for K soil values less than the critical value. Below the critical value is the situation where the risk of yield loss is more likely. Therefore, the recommendation would be to apply a crop removal rate of K. Determine expected yield based on-field productivity. Then multiply the expected yield by the crop removal for P for the crop. Crop removal is 0.35 pounds P2O5 per bushel for corn, and soybean is 0.80 pounds P2O5 per bushel.

Continue with our example of a field (or zone) with a 195 bushel per acre corn yield and a soil test K value of 110 and CEC of 15 meq/100g. The K2O need would be 39 pounds per acre. Therefore, the potash fertilizer recom-

mendation would be 65 pounds. Fertilizer need is calculated by taking the 39 pounds K2O needed, divided by 0.60, the K2O percentage of potash, 0-0-60.

Where your soil test reports show soil K values above the critical value, you can defer fertilizer applications to when fertilizer prices are more favorable. However, keep in mind that if your soil test values are near the critical value, you can only defer for a short time. This is be-

cause soil test K values decline over time, while K is buffered like P, the soil changes from one year to the next due tend to be greater than with P. Estimated change in soil test K values are 6-10 ppm per year from crop removal for grain crop but are higher with forages.

We provide a spreadsheet that many folks have found helpful to do nutrient and fertilizer calculations. You can see that tool at <https://go.osu.edu/ohiofertilitytool>.

5. Use banded placement with a lower rate

"For deficient soils, recommended rates of fertilizer should be applied annually. Placement and timing techniques to enhance nutrient availability, such as sub-surface banding, or spring application, may also be beneficial on nutrient-deficient soils. Applying 25 to 50 percent of the recommended fertilizer in a band to enhance early growth should be considered." Tri-State Fertilizer Recommendation for Corn, Soybean, Wheat, and Alfalfa-2020

6. P & K in manure equal fertilizer pound for pound to maintain soil values, prioritize low soil test fields for manure

Livestock manure is a good P & K nutrient source for crop production. There are two things to know when comparing P2O5 and K2O availability in manure to commercial fertilizer. First, the pounds of available P and K nutrient shown on the manure test is equivalent to commercial fertilizer. Therefore, those manure nutrients are a one-to-one replacement for commercial fertilizer. Second, manure is not a good substitute when starter fertilizer is needed. The key to using manure in the fertility program is to get a manure nutrient test, then use that test to guide the application. Application rates should be determined using both the manure source's N and P content, being sure not to over-apply either nutrient.



The Ohio State Phenology Calendar: Understanding Nature's Biological Clock (Part 1)

By Gabe Karns

A special thanks to Denise Ellsworth from OSU's Department of Entomology for contributing her phenology expertise that makes this article possible!

Phenology, sometimes referred to as the world's oldest science, is the study of recurring biological events and their relationship to weather and climate. Examples of phenological events include bird migration, flowering of plants, and the seasonal appearance of insects. Because the growth and development of plants depend on temperatures, phenological events of plants, such as bud swelling or flowering time, may be useful for monitoring short-term weather patterns. Likewise, scientists can detect long-term changes due to climate change by tracking the pattern of phenological events over many years.



Insects emerge earlier in warmer years than in cooler years, and plants bloom earlier too. The critical assumption in the use of plant phenology to predict other biological events is that the phenological sequence (the order in which events occur) remains constant from year to year even when weather patterns differ greatly. It is no mystery, even to a novice sugar maker, why plant phenology matters in maple. The quality of maple syrup is at stake! Once the phenological calendar for a sequence is established, the biological calendar is easily monitored to anticipate when maple syrup quality drops. If phenology can be grasped, this can greatly simplify the logistics of planning and scheduling monitoring programs, post-season clean-up and sanitization, and other critical activities. And using phenological sequence is valuable to a whole host of applications beyond just maple—beekeepers, naturalists, and gardeners also use the predictable patterns of nature to predict plant bloom and other biological activity.

On The Ohio State University Phenology Calendar website <https://weather.cfaes.osu.edu/gdd/>, degree-day data and related plant bloom and pest emergence sequences are accessible for any location in Ohio. A degree-day is a measure of the amount of heat that accumulates above a specified base temperature during a 24-hour period. A degree-day is also referred to as a growing degree-day (GDD), heat unit, or thermal unit. One GDD accumulates for each degree the average temperature remains above a specified base-temperature over those 24 hours. Several degree-days can accumulate during a 24-hour period. However, it is important to understand that degree-days have meaning only in relation to the base temperature that has been specified. The Ohio State Phenology Calendar uses 50 degrees F as the base temperature. To provide an example, if the average temperature over a 24-hour period is only 47 degrees F with a base temperature of 50 F, no GDDs would accumulate. However, if the 24-hour average temperature was 55 degrees F, 5 GDDs would be added to the phenology calendar (more on degree day calculation <https://weather.cfaes.osu.edu/gdd/glossary.asp>).

To inform The Ohio State Phenology Calendar, daily temperature data from 12 OARDC Research Stations and three USDA-ARS weather stations located throughout Ohio are used to calculate cumulative GDD in real-time. Calculations for locations between weather stations are extrapolated from climatic isotherms for Ohio. Upon entering a date and any Ohio zip code, degree-day accumulation for that location is calculated, and the user is directed to the appropriate spot on the phenology calendar to determine what plants are blooming and what pests are active in their locale. By scrolling through the full phenological calendar, it is possible to see what blooming and pest events have already occurred, as well as what has yet to occur. And by clicking on the Summary tab, you can get a year-by-year breakdown of GDD count for the same date and zip code location across the past 6 years.

It is important to define a couple terms as we launch into species-specific phenology. First bloom is defined as the first flower opening to expose sexual parts. Full bloom is when just one out of twenty buds is still closed while all others are open to expose sexual parts. Of particular interest to maple producers, silver maple is listed first with 34 GDD at first bloom. A bit further down the sequence, silver maple reappears with full bloom at 42 GDD. Red maple first bloom follows at 44 GDD just after silver maple full bloom. Red maple full



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maple averages 75 GDD. Sugar maple is not currently listed on the GDD calendar; however, it is believed that sugar maple tracks very closely with black maple – another of the “hard” maples. While there is some uncertainty about the exact GDD timing for sugar maples, they are definitely “late bloomers” as compared to their “soft” maple counterparts.

- Silver Maple - *Acer saccharinum*: first bloom 34
- Cornelian Cherry Dogwood - *Cornus mas*: first bloom 40
- Silver Maple - *Acer saccharinum*: full bloom 42
- Red Maple - *Acer rubrum*: first bloom 44
- Speckled Alder - *Alnus incana ssp. rugosa*: first bloom 52
- Northern Lights Forsythia - *Forsythia x intermedia*: first bloom 58
- Japanese Pieris - *Pieris japonica*: first bloom 60
- Red Maple - *Acer rubrum*: full bloom 75

The consistency in phenological sequence from year to year demonstrates that even one year of observation is useful to expand the phe-

nological sequence to other plants or insects not included on the OSU calendar. This means that users can readily create, expand, and customize their own biological calendars by observing plants in first or full bloom and taking note of the GDD for that date on the OSU calendar. Many observers use a journal or excel file to track plant and insect activity from year to year, adding in new plants or insects of interest. These calculations can even be made by referring to photographs that show first bloom or full bloom; the photo's date and location can be entered on the OSU calendar to determine the GDD for that event. Insect observations should be of developmental stages, such as egg hatch or adult emergence.

For the maple producer, understanding the predictability of nature's patterns is crucial for better anticipating the end of each maple season. For years and years, sugar maple bud break was the traditional visual signal to take down buckets and end the sap season. Unfortunately, lots of poor-quality sap was made waiting for those first buds to break. Now we know that physiological changes occur within the tree prior to actual bud break that bring seasons to a close earlier. And sanitation issues that result in “sour” sap (due to bacterial build-up) halt most sap seasons before “buddy” sap is rampant. While we are excited to continue tracking sugar maple performance relative to GDDs, keeping an eye on the 100 GDDs mark is a rough indicator for when things are winding down. Some woods will shut down earlier and others will stretch a bit later, but when the Forsythia approaches full bloom in your yard – which occurs right around 100 GDDs depending on variety – you can be sure the end of your sugaring season is nigh.

OSU Extension to Host 2022 East Ohio Women in Agriculture Conference

Ohio State University (OSU) Extension will host the 7th Annual East Ohio Women in Agriculture Conference. The conference is planned for Friday, March 25 from 9:00 a.m. – 3:30 p.m. at Ohio FFA Camp Muskingum, 3266 Dyewood Road SW, Carrollton, OH 44615. All women and young women (high school age) who are interested, involved in, or want to become involved with food, agricultural, or natural resources production or small business are encouraged to attend.

The conference program features a networking fair and sixteen breakout sessions presented by OSU Extension educators, producers, and partner agencies. Sessions this year are focused around four themes: Natural Resources, Plants & Animals, Home & Family, and Special Interest (includes break-out with Ohio FFA State Officers). The conference keynote will be led by Bridget Britton, OSU Extension Behavioral

Health Field Specialist. She and her team will lead participants through “Stoic or Stressed? Talking through difficult topics in a safe space.”

Registered participants, community organizations, or businesses interested in sponsorship can contact 740-461-6136.

Interested individuals can register for the conference online at go.osu.edu/eowia2022. Cost of the conference is \$55 for adult participants and \$30 for students. Conference fee includes conference participation, breakfast, lunch, and conference handouts. Deadline for registration is Friday, March 11. For additional information, please contact Emily Morrison, OSU Extension Coshocton County at 740-622-2265.

Stay connected with the Ohio Women in Agriculture Learning Network on Facebook @OHwomeninag or subscribe to the Ohio Women in Agriculture blogsite at u.osu.edu/ohwomensinag.

Small Ruminant Management: Abortion Causing Diseases

By Dr. Brady Campbell, Assistant Professor,
State Small Ruminant Extension Specialist

For those raising sheep and goats in the Midwest, lambing and kidding season is in full swing. As we enjoy the victories and contemplate the challenges our management systems threw at us this year, it is important to note and document everything that happened so we can evaluate our outcomes at the end of the season. An important statistic to keep in any livestock operation is death loss. This number is valuable to quantify the efficiency of your operation, but without recording a reason for a loss or death in your operation, this statistic ends here. I know that it can be stressful and deflating when we encounter a loss, but understanding why it occurred and the reason behind it will pay dividends as you move forward. Although this discussion is a bit gloomy to talk about, it's an important one none the less. Below, I have outlined some of the common diseases in sheep and goats that are associated with pregnancy loss, abortions, stillbirths, and birth deformities. Be sure to read each of these and compare them to your operation. Even if you don't have issues today, these diseases can rear their ugly head at any given time. Keeping this information tucked away in your farming tool box will be well worth the read.

Campylobacter (Vibrio)

Campylobacter, or more commonly referred to as Vibrio, is caused by a bacterial infection with campylobacter jejuni or fetus. Ewes and does that contract this bacterial infection tend to abort during late pregnancy. For those that do not abort, lambs and kids may be carried full term and can be either born dead (stillbirth) or live. Those that are born live will be small and weak, thus needing further attention. Unfortunately, this disease is rarely detected and is not known until abortions occur. For those experiencing issues with this disease, there are a couple of options to prevent and control future losses. During an abortion storm, tetracycline antibiotics may be used to control current issues. Due note that a valid VCPR will be required to purchase over the counter antibiotics in 2023. For future concerns, commercially produced vaccines are available. Be sure to read vaccine use prior to purchase as initial treatment may consist of a booster. Once a vaccine as such is used with your flock, it must be repeated on an annual basis. Therefore, it is critical to have dead lambs and kids tested at your state diagnostic center to ensure that you are treating for the appropriate disease the reduce your chances of introducing a disease that is not already present.

Chlamydia

Chlamydia is also a bacterial infection caused by chlamydia psittaci. Ewe and does infected with this disease will also abort during the last ~50 days of pregnancy. For those that do not abort, live offspring will be weak and will require special attention to ensure survivability. Just as noted above, antibiotics and vaccines can

be used to control and prevent future outbreaks and issues. Some unique characteristics of Chlamydial infections is that it is easily spread from contaminated bedding that was previously exposed to infected placenta and birthing fluids. Therefore, it is critical to remove infected ewes from the flock and clean the area. Placenta and discharge from infected ewes is said to have a pungent and fowl smell. When purchasing ewes, be sure to acquire from clean flocks. Additionally, it is thought that mature ewe are immune to this disease if previously exposed.

Toxoplasmosis

Toxoplasmosis is an infection caused by the protozoa Toxoplasma gondii. These protozoal oocyst survive and remain active in the soil for several years and is therefore difficult to completely manage. Ewes and does that contract this disease during early pregnancy may abort or reabsorb the fetus. During late pregnancy, fetuses may be stillborn or live. Those that are live can either be weak or born normally. The vector that catches most grief due to association with Toxoplasmosis is the domestic cat. If you choose to keep cats in your barns for vermin control, keep only those that are spayed or neutered and those that are older as they tend to be less of an issue. Furthermore, storing feeds appropriately also ensures that vermin such as raccoons and opossum steer clear as they too are known to be carriers of the disease.

Cache Valley Virus (CVV)

Cache Valley has become a sour name over the past few years in the sheep industry. As the name states, this disease is caused by a virus and therefore is challenging to control. Animals contract CVV in the fall during or after the breeding season. Cache Valley is spread via mosquitos and biting midges. Ewes and does that are infected during early pregnancy may either reabsorb or abort their fetuses. Those that carry to full term usually result in stillbirth that have severe deformities. Unfortunately, at this time there is no vaccine available for this virus. It is however thought that animals that were previously infected will develop innate immunity to the disease. The best recommendation available at this point is to avoid wet, marsh like areas during and after the breeding season. Animals housed indoors should have access to proper ventilation to discourage insect accumulation.

Listeriosis

Although not a disease that we commonly associate with abortions and one that is typically human induced, Listeriosis is a bacterial infection caused by Listeria monocytogenes. This issue is most common in systems that feed fermented feeds (i.e., silage, baleage, haylage) or feed hay that is stored and/or fed out doors. If the infection is severe enough, ewes and does will abort. Other indicators that an animal is facing challenges with Listeriosis is neurological symptoms that are associated with this infection. Infected animals may circle, press their heads



against a wall as they attempt to relieve swelling of their brain, drooling, and incoordination. To avoid these issues, be sure to monitor feed spoilage by limiting the amount of time a fermented feed is offered before replacing with fresh feed. Additionally, fermented feeds should have a low ash content, a pH that is <4.5, and stored in an anaerobic (oxygen deprived) environment. Animals demonstrating signs of Listeriosis can be treated if detected early. Consult with your local veterinarian for the most appropriate treatment protocols.

Noninfectious agents (toxic plants, genetic, nutrition)

Last, but certainly not least, producers may face noninfectious agents that result in abortions in their flocks and herds. Plants, both natural and cultivated, can have unique livestock challenges through out the year. Does anyone remember the herd of goats this past year that all perished because someone thought that feeding yard and Christmas waste that contained yew was appropriate? This seemingly kind gesture turned into a devastating loss for the producer. Poisons and toxins in plants can create serious issues that may result in abortions if the dose is low enough that does not cause death. To minimize your chances of facing these issues, scout your pastures regularly for downed trees after extreme weather events or toxic plants growing or thrown across the fence line.

It is my hope that you won't experience a loss in your flock or herd this year, but in the case that you do, please take a few minutes to truly investigate the cause of death. If you aren't able to do so or don't feel comfortable, find a mentor, neighbor, or fellow producer in the area that can assist. Determining the reason upon why a loss occurred is extremely important not only for your bottom line, but to also protect your animals and yourself from future challenges that could be more severe in the future. So the next time you have to dig a hole or turn the compost bin, make certain that you understand what happened to the animal that you lost and formulate a plan upon how you and your operation will overcome the challenge.

Happy Shepherding!



Fertility Calculator for Ohio Recommendation

By Greg LaBarge, CPAg/CCA

A Microsoft Excel spreadsheet has been developed to support nutrient management education programs provided by Ohio State University Extension and for users who want to generate their own recommendation or compare recommendations provided to them to the Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat, and Alfalfa, 2020. The spreadsheet is designed to be compatible with Excel version, Excel 1997-2003 or later.

The tool generates recommendations for the following crops:

1. Corn
2. Corn-Silage
3. Soybeans
4. Wheat (Grain Only)
5. Wheat (Grain & Straw)
6. Alfalfa
7. Grass Hay
8. Grass/Legume Hay

Overview of spreadsheet features:

- There are 21 data lines.
- Data can be copied from another spreadsheet or within the spreadsheet
- User controls whether recommendations are build/maintenance or maintenance only for phosphorus (P) & potassium (K) recommendations.
- User can select when a field the critical level used for corn/soybean rotations or wheat, alfalfa, or grass legume hay for P recommendations.
- Can select a shorter or longer buildup period than standard 4 year for P & K.
- P & K recommendations are displayed with buildup and maintenance requirements separately.
- Total fertility need can be determined for a 1-, 2- or 3-year application on P & K Recommendation page.
- Lime recommendations are developed using target final soil pH and tillage depth.
- User can compare cost of two lime sources on lime recommendation page.
- User can determine total cost of P & K fertilizer needed to meet the nutrient recommendation.
- User can determine total cost of Lime needed in the recommendation developed.

The spreadsheet is available at:
<https://go.osu.edu/ohiofertilitytool>

A printed User Guide is available at:
<https://go.osu.edu/ohiofertilitytoolguide>

A video demonstration at:
<https://go.osu.edu/ohiofertilitytoolvideo>

OSU EXTENSION CALENDAR OF EVENTS

MARCH 2022

- 6-12 Ohio 4-H Week
- 7 ServSafe Food Protection Manager Certification Program, 9-3 p.m., Ag Credit Building Conference Room
- 7 Jr. Fairboard Meeting, 7 p.m. Fairgrounds
- 10-13 National 4-H Youth AgriScience Summit, Washington, D.C.
- 12 Ohio 4-H Conference – Greater Columbus Convention Center
- 15 Cake Decorating 101 **Registration Due**
- 15 BQA Re-Certification & Certification, 6:30 p.m., Ag Credit Building Conference Room
- 17 Seeds To Start Early Program, 10:30 a.m., Selover Library in Chesterville
- 17 4-H Horse & Pony Committee, 7:30 p.m., Ag Credit Building Conference Room
- 17-20 Ohio Beef Expo, Ohio Expo Center, Columbus
- 19 Cake Decorating 101, Ag Credit Building Conference Room, 10 a.m. or 1 p.m.
- 22 4-H CARTEENS, Ag Credit Building Conference Room, 6:30 p.m.
- 23 Pesticide/Fertilizer Recertification, 5:30-9:30 p.m., Ag Credit Building Conference Room
- 24 Sr. Fairboard Meeting, 7:30 p.m., Fairgrounds
- 30 Seed Starting Class, 2 p.m., Perry Cook Memorial Library, Johnsville
- 31 Seed Starting Class, 6 p.m., Ag Credit Building Conference Room

APRIL 2022

- 1 Career Exploration Workshop – Construction Trades **Registration Due**
- 1-3 Showstick Wars, Morrow County Fairgrounds, Check out facebook or contact Kyndall 419-571-6623
- 4 Jr. Fair Board, 7 pm, Fairgrounds
- 4 County Quality Assurance Test-out, see article
- 5 Opening Up Your Garden Class, 6 p.m., Headwaters Education Center

- 6 Morrow County Cattleman's Meeting, 6:30 pm, Ag Credit 2nd Floor Conference Room
- 8 Career Exploration Workshop – Nursing **Registration Due**
- 9 Career Exploration Workshop – Construction Trades, Tri-Rivers Career Center, 9 a.m.-2:30 p.m.
- 12 Growing Your Own Food Class, 6 p.m., Headwaters Education Center
- 12 New 4-H Volunteer Training, 6:30 pm, RSVP Required
- 14 Career Exploration Workshop – Nursing, Marion Technical College, 9 a.m.-3 p.m.
- 21 Horse and Pony Committee, 7:30 pm, Ag Credit Building Conference
- 21 Container Gardening Class, 10:30 a.m., Selover Library, Chesterville
- 26 First & Second Year Members QA (Parent Required), 6:15 p.m., Fairgrounds, RSVP Required
- 27 Companion Planting Class, 2 p.m., Perry Cook Memorial Library, Johnsville
- 28 Sr. Fairboard, 7:30 p.m., Fairgrounds
- 30 4-H Project Enrollments Due!!!! Join 4-H!

MAY 2022

- 2 Plant Swap Class, 6:30 p.m., Selover Library, Chesterville
- 2 Jr. Fair Board, 7 p.m., Fairgrounds
- 2 Youth Photography Workshop **Registration Due**
- 4 Morrow County Cattleman, 6:30 p.m., Ag Credit Building Conference Room
- 7 Youth Photography Workshop, Ag Credit Building Conference Room, 10-1:30 p.m.
- 9 Quality Assurance, 6:15 p.m., Fairgrounds
- 10 Hanging Basket Make & Take Class, 6 p.m., Headwaters Education Center
- 12 Plant Swap, 6:30 p.m., Selover Library, Marengo
- 17 Quality Assurance, 6:15 p.m., Fairgrounds
- 19 Horse and Pony Committee, 7:30 pm, Ag Credit Building Conference Room
- 23 Quality Assurance, 6:15 p.m., Fairgrounds

- 24 4-H CARTEENS, Ag Credit Building Conference Room, 6:30 p.m.
- 25 Creating a Pollinator Garden with Native Perennials Class, 2 p.m., Perry Cook Memorial Library, Johnsville
- 30 Happy Memorial Day - Office Closed

JUNE 2022

- 1 Morrow County Cattleman, 6:30 p.m., Ag Credit Building Conference Room
- 6 Jr. Fairboard, 7 p.m., Fairgrounds
- 7 Jr. Fair Entries Due
- 17 Illustrated Talks & Public Speaking Contests **Registration Due**
- 20 Early Project Judging
- 20 Ohio State Fair Entries Due
- 21 Illustrated Talks & Public Speaking Contests, Ag Credit Building Conference Room, 6 p.m.
- 22 Common Garden Insects Class, 2:00 p.m., Perry Cook Memorial Library, Johnsville
- 28 How To Enter Flowers in the Fair Class, 6 p.m., Headwaters Education Center
- 29-July 1 S.T.E.M. Camp, Ag Credit Building Conference Room, Times TBD

JULY 2022

- 6 Morrow County Cattleman, 6:30 p.m., Ag Credit Building Conference Room
- 21 Herb Garden Make & Take, 6 p.m., Bunkers Mill Winery, Cardington
- 23 Cloverbud Fun Day, Ag Credit Building Conference Room, 9 a.m.
- 26 4-H CARTEENS, Ag Credit Building Conference Room, 6:30 p.m.
- 27 Common Garden Diseases Class, 2 p.m., Perry Cook Memorial Library, Johnsville

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

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