

Auglaize County OSU Extension Weekly Agriculture Newsletter – January 8, 2020

Scouting and Latest Information

Hello!! Good morning! I pray you are well.

If you are a buyer or seller of hay, let me know and I can keep a list to share with others. Call the OSU Extension office at 419-739-6580 or e-mail me at stachler.1@osu.edu. If you are in need of some grass hay, I know of an individual that has lots of Teff hay.

Joke: What do you call an Arab dairy farmer??

Rain fell four days since the last newsletter. Rainfall for Tuesday, December 31st, ranged from 0.01” at my house south of St. Marys, near Bloody Bridge, and near Townline – Lima and Wapakoneta – Fisher Roads to 0.31” near Valley and Idle Roads. Rainfall on Thursday ranged from 0.05” near Bloody Bridge to 0.35” near Valley and Idle Roads. Rainfall on Friday ranged from 0.04” at about 2 miles southeast of Fryburg to 0.4” near Uniopolis. Rainfall on Saturday ranged from a Trace at about 1 mile north of St. Marys to 0.05” at about 1 mile northeast of Fryburg. Rainfall for the week ranged from 0.31” at about 2 miles southeast of Fryburg to 0.77” near Idle and Valley Roads. The average liquid precipitation for the week was 0.46”. The average high temperature should now be around 35 degrees F, a 2-degree drop from last newsletter. Temperatures were way above normal for most days with some greater than 25 degrees F above normal, but the first two days were below normal.

Wheat – I rate the wheat the same as last week which was 7% excellent, 29% good, 69% fair, and 0% for poor and very poor.

Alfalfa – Nothing to report.

Corn – There is still corn to be harvested in the county.

Soybean – Nothing to report.

Weeds – Nothing to report

Insects - No report.

There were NO changes to the XtendiMAX, Engenia, FeXapan and Tavium labels. The Engenia label still has the most approved products compared to XtendiMAX and FeXapan. No new herbicides were added to the XtendiMAX label this past week, which totals 201 herbicides. No new adjuvants were added the XtendiMAX label, now totaling 386. No new nozzles were added to the XtendiMAX label, which totals 36. No new Drift Reducing Adjuvant (DRA's) were added to the XtendiMAX label this week, making a total of 64 DRA's. No new nutritional products were removed from the XtendiMAX label which totals 215. No new products were added to the Insecticides, Fungicides, Plant Growth Regulator and Other group on the XtendiMAX label which totals 97. No new adjuvants were added to the Engenia label, which now totals 500. No new herbicides were added to the Engenia label, which brings the total herbicide count to 146. No new products were added to the Other category (growth regulators, and fungicides) on the Engenia label, which totals 29. No new insecticide were added to the label which currently has 28 products. No new Drift Reducing Adjuvants (DRA's) were added to the Engenia label, which totals 108. No new nozzles were added to the Engenia label, which totals 29. No new nutritional products were added to the Engenia label which totals 177 products. No new product was added to the pH Modifier group of the Engenia label which totals 16 products. The FeXapan label has many of same the products and nozzles as the XtendiMAX label, but NOT all are the same, so check the FeXapan label carefully. There are 120 herbicides, 49 DRA's, 312 adjuvants, 151 nutritionals, 44 insecticides, fungicides, and others, and 26 nozzles that have been approved for the FeXapan label. There are 13 herbicides, 66 DRA's, 185 adjuvants, and 41 nozzles approved for use with Tavium.

Upcoming Meetings

Get signed up for these important meetings!! Time is running out for some of these meetings.

- 1. Ag Outlook.** This meeting will be held **January 8, 2020** from 1:00 PM to 4:30 PM and a second session from 5:45 PM to 9:15 PM at the Wapakoneta Eagles (25 East Auglaize St., Wapakoneta). Topics discussed will be Farm Bill Nuts and Bolts, Farm Bill, Farming Outlook, and Grain Market Outlook. Register before 12-31. A meal will be provided for free between the two sessions. See attached flyer for more information.
- 2. Small Grains Management Workshop.** This meeting will be held **January 9, 2020** from 9:00 AM to 2:30 PM in the downstairs room of the Auglaize County Administration Building (209 S. Blackhoof St.). This will be the best small grains meeting you have ever been to so get signed up. See the flyer for additional information.
- 3. Plant and Soil Nutrient Management.** This meeting will be held **January 22, 2020** from 8:30 AM to 4:00 PM. The location will be the Eagles in Wapakoneta. Topics to be discussed include Soil pH and amendments, Phosphorus, Potassium, and Nitrogen management, New Tri-State Fertility Recommendations, micro-nutrients, and biostimulants, growth regulators and more. The cost of the program is free and fertilizer, CLM, and CCA credits are available. Please bring one soil test report with you to the meeting! Register before January 13, 2020. Contact the Auglaize County Extension office at 419-739-6580 for more information.
- 4. Auglaize County Agronomy Day.** The meeting will take place on January 27, 2020 from 9:00 AM to 3:00 PM. This meeting will meet the needs for pesticide (all categories) and fertilizer recertification. Kelley Tilmon will speak about insect pests at 10:00 AM. The meeting location is St. Joseph Parish Life Center (101 W. Pearl St.) in Wapakoneta. Lunch is on your own. The meeting is free if you are attending just for the information. If you need recertification credits for pesticide license the fee is \$30.00. If you need recertification credits for fertilizer, the fee is \$10.00. If you need both the fee is \$40.00. You can register by contacting the office at 419-739-6580.

Answer to joke: A milk sheik

2019 Agriculture Year in Review

2019 started out with above average temperatures with a high of 56 degrees F on January 8th. For the remainder of January temperatures were below average with the lowest high of 2 degrees F on January 30th. February was slightly above normal. March was 4 degrees colder than normal. April and May averaged normal high temperatures. June was slightly below normal high temperatures. July was 2 degrees above the normal high. August was slightly below normal high temperatures. September was 3.5 degrees above the average high. October was 3 degrees above the normal high. November was 6 degrees below the average high. December was 5 degrees above the average high.

Rainfall in January was 1.72 inches, February was 3.3 inches, March was 3.80 inches, April was 6.86 inches, May was 8.10, June was 6.60 inches, July was 4.67 inches, August was 3.3 inches, September was 2.30 inches, October was 3.55 inches, November was 1.06 inches, and December was 2.27 inches. Rainfall was above normal for all months except January, August, September, November and December, with April and May receiving twice the normal precipitation. Total average rainfall for the county for 2019 was 47.49 inches for the county which is 10.49 inches above normal. The range in yearly rainfall ranged from 45.59 inches at about 2 miles southeast of Fryburg to 53.2 inches at about 1 mile north of St. Marys. This year had to be one of the wettest years on record, but I can't find that data. Total average snowfall for the year was 31.6 inches which is 11.6 inches above normal.

The first corn was planted about April 15th in the county, but just a few fields. The next planting window was just before May 15th with 3% of corn planted. The first real planting of crops occurred on around June 8th with 60% of corn and 38% of soybean planted by June 12, 2019. Planting did not finish until July and thousands of acres were prevent planted in Auglaize County. This was the worst planting season anyone can imagine and the soil was very hard for most of the growing season.

Much of the wheat and alfalfa stands were lost from the cold weather and saturated soils. Despite wheat looking poor early during the growing season it looked pretty good at harvest time. Wheat harvest began on July 1st and most yields were between 70 and 90 bushels per acre. With the rain head scab was present and some people had to deal with vomitoxin, but overall it was not as bad as it could have been.

Corn and soybean beans looked fairly well for most of the season despite the lost stands and poor growing conditions early. Few insect problems occurred this season other than potato leafhopper on alfalfa. Grey leaf spot came into corn early in the season, but progressed very slowly. Northern corn leaf blight came into corn late and did not develop too much in most fields. Frogeye leaf spot came into soybeans but progresses slowly and was no real threat.

Despite the rough start corn yields ranged from 140 to 245 bushels per acre and soybean yields ranged from 37 to 68 bushels per acre

Waterhemp and giant ragweed were the two most prevalent weeds in soybean fields just prior to harvest. Waterhemp was observed in 53% of fields, the greatest about observed since 2015 and giant ragweed was observed in 32% of fields, which was a 33% drop from 2018. The reduction in giant ragweed and the increase in weed free fields by 7% compared to 2018 is a positive move in improving weed control in the county, however we need to really focus on the waterhemp.

The average yearly corn price for 2018 as of the end of November is \$3.76 per bushel compared to \$3.47 per bushel in 2018. The average yearly soybean price for 2019 as of the end of November was \$8.40 per bushel compared to \$9.15 per bushel for 2018. The average yearly wheat price for 2019 as of the end of November was \$4.75 per bushel compared to \$5.14 per bushel in 2018. The average yearly price for hogs in 2019 as of the end of November is \$52.35 per hundredweight compared to \$49.94 per hundredweight. The average yearly price for beef in 2019 as of the end of November is \$115.91 per hundredweight, compared to \$115.75 per hundredweight in 2018. As of the end of November 2019 the milk price was \$21.00 per hundredweight, compared to \$19.90 in October of 2019 and \$17.20 in November 2018.

C.O.R.N. Newsletter

<https://agcrops.osu.edu/newsletter/corn-newsletter>

Dr. Peter Thomison Retires



Dr. Peter Thomison

Dr. Peter Thomison, Professor and Extension State Specialist for corn production, retired from Ohio State University at the end of December 2019 after 30 years of service.

Peter was an active member of OSU Extension's Agronomic Crops Team. He contributed hundreds of timely, high-impact articles to the CORN newsletter, wrote several bulletins and Fact Sheets, and could be seen throughout Ohio during winter extension meetings and field days. Peter was at the forefront of corn production research, including corn hybrid by management interactions, causes and identification of abnormal corn ears, phenological responses of corn to heat accumulation, and agronomic performance and grain quality of specialty corn. Peter's extension and research efforts to develop cropping systems that minimize production inputs and impact on environmental quality will have a lasting effect on extension, farmers, and the ag industry.

On a personal note, I will thoroughly miss Peter. Peter was extremely instrumental in helping me establish my extension and research program at Ohio State (and even served a mentor on my advisory committee during my Master's degree program). Peter was always available to answer questions and provide guidance, and I enjoyed talking with him almost every day.

Congratulations on your retirement, Peter! You will be greatly missed by all of us on the Ag Crops Team. Thank you for your efforts over the past 30 years and best wishes for the future.

Author(s):

[Laura Lindsey](#)

2019 eFields Releasing on January 8th

Now that 2019 has come to an end, many of us are ready to leave the memories of the challenges we faced last season behind. However, the weather conditions we dealt with provided us an opportunity to learn how we can be more resilient in agriculture while learning how to deal with the growing conditions experienced. The 2019 eFields Research Report highlights 88 on-farm, field scale trials conducted in 30 Ohio counties. Research topics include nutrient management, precision crop management, cover crops, and forages. Additional information about production budgets, planting progress, and the 2018 Farm Bill is also included.

The 2019 report is now available in both a print and e-version. To receive a printed copy, contact your local OSU Extension office or email digitalag@osu.edu. The e-version can be viewed and downloaded at go.osu.edu/eFields with the online version readable on smartphone or tablet devices.

The eFields team has planned six regional results meetings to discuss local results and gather information about research interests for 2020. There is no cost to attend; for more information or to register for a meeting, visit go.osu.edu/eFieldsMeeting. Please plan to join us for the meeting nearest you:

Southwest Region: February 10th, 9AM-12PM, Wilmington

Northwest Region: February 26th, 9AM-12PM, Bryan

Central Region: February 27th, 9AM-12PM,

South Central Region: March 9th, 9AM-12PM, Circleville

East Region: March 10th, 6-9PM, Coshocton

West Central Region: March 16th, 9AM-12PM, Piqua

We would like to sincerely thank all of our 2019 collaborating farms and industry partners. The eFields team enjoys working with each of you and we are looking forward to continuing to learn together in 2020.

Follow our social media using @OhioStatePA on Facebook, Twitter, and Instagram or subscribe to our quarterly newsletter, Digital Ag Download (go.osu.edu/DigitalAgDownload), to keep up with the eFields program throughout the year. For more information on how to get involved in eFields in 2019, contact Elizabeth Hawkins at hawkins.301@osu.edu.

Author(s):

[Elizabeth Hawkins](#), [John Fulton](#)

Considerations for Stored Seed

Additional authors: Andrew Evans, OSU Horticulture & Crop Science and John Armstrong, Ohio Seed Improvement Association

2019 was full of challenges, including what to do with purchased seed that did not get planted. If the purchased seed was not returned and was stored with intent to use it in the 2020 season, producers should consider re-testing the seed lots for germination and possibly add a seed vigor test to help make planting decisions for 2020. Most seed germination percentages on a seed tag for agricultural seeds (like corn and soybeans) are valid for 12 months from the last date of the month in which they were completed, with the exception being cool season grasses which are valid for 15 months beyond the month of testing (Ohio Revised Code, Chapter 907.07).

Table 1. Change in germination over time for five corn and five soybean seed lots stored in a non-conditioned warehouse.

Crop	Lot	Period of open storage (months)		
		0	6	12
		Germination (%)		
Corn	A	98	97	94
	B	96	96	88
	C	98	97	90
	D	98	97	44
	E	96	94	22
Soybean	A	86	87	81
	B	94	90	80
	C	90	84	74
	D	88	77	44

Seed quality is key to establishing a good crop, with major components of quality being genetic quality, physical purity (% other crops, % inert, and % weeds), and physiological quality (seed germination and vigor).

	E	86	56	12
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Over time the physiological quality of a seed lot can change, especially as a result of its storage environment. Storing seed where the temperature (in degrees F) plus the % relative humidity are less than 100 (Harrington's rule) helps to minimize the rate of seed deterioration (or loss in germination and vigor). However, in non-conditioned storage conditions viability may vary dramatically after 12 months with different seed lots that had similar initial germination rates (Table 1).

Seed germination is an important consideration for determining seeding rate to ensure the critical final stand for yield is achieved for crops like corn and soybeans. Check the seed tag for both the date of the test as well as the germination when planning seeding rates. This percentage is usually derived from the results of a standard warm germination test, which often assesses seed germination under optimal conditions (warm moist temperatures). To determine a seeding rate for a targeted harvest population (e.g. 32,000 plants/ac for corn), then divide your harvest population by the germination (e.g., 95%) as a decimal. In this example, 33,684 seeds/acre ($32,000/0.95$) would need to be planted to achieve the desired harvest population given an 95% germination rate.

A seed vigor test can provide further insight into how a seed lot may perform in the field under stressful conditions compared to other seed lots. This information could help producers plan for what lots should be planted early vs. later, as well as positioning fields that are typically more stressful for seedlings. A higher vigor score is usually more tolerant of adverse conditions than a lot with a lower vigor score. These can be used on carry over seed lots, but also can be conducted on new seed lots prior to planting.

Common seedling vigor tests include a cold test (cold moist soil) or a saturated cold test (cold moist soil conditions plus embryo is placed directly into soil). The cold test and saturated cold test provide insight into germination of a seed lot under cool conditions common to April planting dates. The cold test uses of cool moist conditions with the addition of soil, and can be conducted using rolled towels or shallow trays. The saturated cold test is a more standardized version of the cold test that uses sieved soil, the soil contains more water content (lower oxygen content as well), and places the embryo directly into the cold wet soil. The accelerated aging test helps estimate longevity of seed in storage, and has been related to field emergence and stand establishment. The seeds in this test are exposed to a short period of high heat and humidity conditions (ex: 2-3 days, 105 degrees F, 100% relative humidity) before a standard germination test is conducted. Others, such as a seedling growth rate test, can provide insight into germination as well as the amount of energy storage reserves in the seeds.

The recommendation for sampling a specific seed lot for testing is that a sample should be collected from 5 bags plus 10% of the remaining bags for that lot to ensure a representative sample. Please look to the NCR

bulletin 403 - Seed Lot Sampling for more specific guidelines (<https://www.ag.ndsu.edu/fss/seed-increase-program/seed-lot-sampling-ncr-bulletin-403>).

Source:

J.C. Delouche and C.C. Baskin. 1973. Seed Science and Technology 1:427-452.

A.D. Knapp, T.J. Gutormson, and M.K. Misra. 1991. Seed Lot Sampling. Northcentral Region Extension Bulletin 403.

Seed Vigor Testing Handbook. 2002. Association of Official Seed Analysts.

Author(s):

[Alexander Lindsey](#)

2019 Organic Corn Performance Test Results Available

In January 2019, Ohio State University / Ohio Agriculture Research and Development Center was approached by a representative of the organic seed industry inquiring if an organic corn performance test would be possible. Organic seed suppliers were contacted to gauge their interest and gather input on test protocol. The end result, 35 organic hybrids representing 7 commercial brands were submitted for evaluation in the new Organic Corn Performance Test. The tests were conducted on certified organic fields in Apple Creek and Wooster (Fry and West Badger Farms) and intensively managed for nutrients and weed control. Each hybrid entry was evaluated using four replications per site in a randomized complete block design. Hybrids were planted either in an early or full season maturity test based on relative maturity information provided by the companies. The relative maturity of hybrid entries in the early maturity trial was 106 days or earlier; the relative maturity of hybrid entries in the full season trial was 107 days or later. The planting rate was 34,000 seeds/acre with a final stand target of 30K – 31K plants/acre. Composted manure and Chilean Nitrate were applied according to recommended cultural practices for obtaining optimum grain yields.

The spring of 2019 was one the wettest on record and resulted in major planting delays throughout Ohio. According to the National Agricultural Statistics Service, only 33% of Ohio's corn was planted by June 2. The Organic OCPT fields were planted May 24th and 25th into fields with optimal soil moisture & temperature for uniform emergence and early growth. Frequent rain events continued into June limiting weed control opportunities. Timely rains in August and September, combined with above average

temperatures, were favorable for corn development and extended the grain fill period. Diplodia ear rot was observed in a few hybrids at low levels. Stalk lodging, while present, was generally one or two nodes below the ear node and did not impact harvestability for most hybrids. The Wooster/Apple Creek areas were fortunate and missed most of the weather extremes experienced in other parts of Ohio. Excellent conditions throughout the growing season minimized stress.

Despite delayed planting dates, above normal rainfall and warmer than normal conditions during grain fill, Organic OCPT yields exceeded expectations. Averaged across hybrid entries in the early and full season tests, yields were 236 bu/A. Yields at individual test sites, averaged across hybrid entries in the early and full season tests, ranged from 232 bu/A at Apple Creek to 240 bu/A at Wooster.

Confidence in test results increases with the number of years and the number of locations in which the hybrid was tested. Look for consistency in a hybrid's performance across a range of environmental conditions. Yield, standability, grain moisture, and other comparisons should be made between hybrids of similar maturity to determine those best adapted to your farm. Results of the crop performance trials for 2019 are available online at: <http://www.oardc.ohio-state.edu/organiccorntrials>. Hybrids can be sorted by yield, brand, and other variables online.

Author(s):

[Rich Minyo](#), [Allen Geyer](#), [David Lohnes](#), [Peter Thomison](#)

Northwest Ohio Corn & Soybean Day

The annual Northwest Ohio Corn & Soybean Day is scheduled for Friday, January 17 in Founders Hall at Sauder Village in Archbold from 8:00 am to 2:30 pm. The program has a variety of speakers, farmer/retailer re-certification credits and 30 exhibitors sharing information on management practices for the 2019 crop production season.

Topics and speakers for the day include:

Drainage for Crop Production and Soil Health

Eileen Kladvko, Professor, Purdue University

Biology and Management of Pigweeds

Jeff Stachler, OSU Extension, Auglaize County

Farmer Attitudes and Behaviors in WLEB

Robyn Wilson, Professor, OSU School of Natural Resources

Corn Nematodes

Abasola Simon, PhD Candidate, OSU Plant Pathology

CORE Pesticide Update

Stephanie Karhoff, OSU Extension, Williams County

Farm Bill Decision 2019-2020

Eric Richer, OSU Extension, Fulton County

Fumigation: Caring for your stored grain

Curtis Young, OSU Extension, Van Wert County

The following continuing education credits for pesticide and fertilizer applicators are offered throughout the day:

- Private Pesticide Applicator Re-certification: 3hrs in categories Core, 1, 2, and 6.
- Commercial Pesticide Applicator Re-certification: 2.5hrs in categories Core, 2C, 2D, 10C
- Fertilizer Applicator Re-certification (Private & Commercial): 1hr category 15p/15c
- Michigan: 3 hours
- Certified Crop Advisors: 4.5 hours IPM, PD, and SW

Pre-registration is \$35 and should be postmarked by January 8. Later registrations and at the door registrations are \$50, space permitting. Registration includes coffee/rolls, lunch, and speaker materials. A more detailed agenda, list of sponsors and registration information can be found at <http://fulton.osu.edu>. Contact Eric Richer, Extension Educator, Agriculture & Natural Resources, 419-337-9210 or richer.5@osu.edu for more information.

Author(s):

[Eric Richer, CCA](#)

2020 Conservation Tillage Club Breakfast Program Dates Announced



Conservation Tillage Club Breakfast

The 2020 Conservation Tillage Club breakfast program series will begin on Tuesday, January 7 at the Plaza Inn Restaurant in Mt. Victory. Each session will start at 7:30 am with a complimentary buffet breakfast followed by the program at 8:00 am. Other sessions will be held on January 21, February 4 and 18.

On January 7, the program will feature Ben Brown, Assistant Professor of Professional Practice in Agricultural Risk Management, Department of Agricultural, Environmental, and Developmental Economics at The Ohio State University speaking on the Grain Marketing Outlook. Grain producers have not only had to deal with weather extremes in the past year, but also have had the market affected by policy decisions by a trade war with China and the African Swine Fever overseas. As markets develop worldwide with improved infrastructure in South America, demand also is being affected through pending trade deals with Mexico and Canada. Renewable fuel standards, prevented planting crop insurance, and Market Facilitation Plan payments have also played a role in marketing plans as farmers look for ways to improve their position with a successful 2020 crop year and implementation of the 2018 Farm Bill programs.

The January 21 program will feature Anne Dorrance, Professor, Plant Pathology at Center for Applied Plant Sciences at The Ohio State University and State Specialist, Soybean Diseases, OSU Extension. Dorrance was recently named Associate Dean and Director for the Wooster Campus and Associate Director for the Ohio Experiment Station in the College of Food, Agricultural, and Environmental Sciences. Her presentation will be discussing diseases important to soybean production, including Phytophthora root and stem rot, Frogeye leaf spot, and Sclerotinia stem rot. Her recent work has also included Soybean Cyst Nematode and how management of this pest can affect soybean yields. She will address the process of

choosing the best seed variety based on disease resistance packages and rating scales so that producers' fields that can hold up to the all the challenges facing soybeans in Ohio.

February 4 Hans Kok will address the breakfast attendees on soil health. Sponsored by the American Farmland Trust, Kok is the Coordinator of the Indiana Cropping Systems Initiative, Indiana Conservation Partnership. The Conservation Cropping Systems Initiative is a farmer-focused and farmer-driven process. The program works with local level partnerships and others to promote the adoption of practices and cropping systems that can lead to improved soil health. Much of the work has been with cover crops with benefits of reducing soil compaction, covering the soil to protect it from erosion by wind and water, improving soil structure, increasing soil organic matter, fixing nitrogen from scavenging the nutrient from the soil that would otherwise be lost to percolation, runoff or volatilization, as well as producing forage or pasture from cover crops.

The February 18 program will feature Mark Seger, Ohio Department of Agriculture Engineer for Northwest Ohio discussing the implementation of H₂Ohio. Through collaboration among the Ohio Department of Natural Resources, Ohio Environmental Protection Agency, Ohio Department of Agriculture, and Ohio Lake Erie Commission, H₂Ohio will address critical water quality needs and support innovative solutions to some of the state's most pressing water challenges. This new initiative was recently rolled out by Ohio Governor DeWine to impact phosphorus reduction by using cost share incentives to help producers get practices on the land to improve water quality statewide. Practices that Seger will address include variable-rate fertilization, subsurface nutrient application, manure incorporation, conservation crop rotation, cover crops, and drainage water management. Information will be presented to put plans into practice locally, utilizing cost share funds administered through this program.

The Conservation Tillage Club breakfast program series is jointly sponsored by OSU Extension and the Soil and Water Conservation Districts of Hardin, Logan, and Union Counties, and in cooperation with the USDA Natural Resources Conservation Service. Breakfast is courtesy of the generous support from agricultural lenders and agricultural businesses. All events are open to the public and no advance registration is required. Continuing education credits for Certified Crop Advisers have been approved.

Author(s):

[Mark Badertscher](#)

The 2020 Central Ohio Agronomy School will be held on Monday evenings, beginning on Monday

February 10 through Monday March 9, from 6:30 –9:00 p.m. in the conference room of the Ag Services Building, 1025 Harcourt Rd. Mt. Vernon, Ohio 43050. This five-week program will provide the attendees with the most comprehensive, up-to-date crop production and agricultural technology information available today. This school is designed with everyone in mind; part-time or full-time producer, beginner or CCA agronomist. Within each subject area we will teach the basic concepts and progress to the most advanced agronomic principles.

Topics include:

February 10 - Bruce Ackley, OSU Weed Science.

Weed Identification with Live Plants at Various Growth Stages.

Palmer, Waterhemp, Pigweed, Marestalk, Various Grasses and more!

- Dr. Mark Loux, OSU Weed Science

Developing a Multi-Year Herbicide Program for Tough to Control Weeds

Weed control update for 2020

February 17 - Dr. Scott Shearer, OSU Chair, Food, Agriculture and Biological Engineering
Field Compaction Research

- Dr. Elizabeth Hawkins, Field Specialist, OSU Extension

2019 On-farm Research Results

February 24 - Ben Brown, OSU College of Food, Agriculture, & Environmental Sciences
Farming & Marketing in an Uncertain World

- Peggy Hall OSU Agricultural & Resource Law Program

“Hot” Agricultural Law Topics

March 2 - Glen Arnold, Field Specialist, OSU Extension

Is Manure Right for You?

- Dr. Jeff Stachler, OSU Extension – Auglaize County

Weed Seeds in Manure.

March 9 - Marne Tichenell, Wildlife Specialist, OSU Extension

Wildlife Damage in Field Crops

- Aaron Wilson, Byrd Polar and Climate Research Center

How Weather is Affecting our Farming Operations

2018 Weather Outlook

This school will provide:

14 continuing education credits (CEU's) for Certified Crop Advisors,

C.M. 2, I.P.M. 6.5, N.M 2, P.D. 1.5, S&W 2.0.

8 hours of Commercial Pesticide Credits

Core - 2 hrs., 2a - .5 hrs., 2c - 2 hrs., 2d - .5 hrs., 9 - .5 hrs., 10c - .5 hrs., 15 - 2 hrs.

8 hours of Private Pesticide Recertification Credits

Core - 2 hrs., Cat 1- 2.5 hrs., Cat 2 - .5 hrs., Cat 6 - .5hrs., Cat 7 - .5 hrs., Cat 15 - 2 hrs.

Registration costs vary due to CUE credits and pesticide applicator credits.

This program is sponsored by The Ohio State University Extension, Advantage Ag & Equipment, B&B Farm Service, Central Ohio Farmers CO-OP, Channel, Clark Seeds, Cabbage Electric, Farmcredit, First-Knox National Bank, and Seed Consultants.

For more information contact the OSU Extension Office in Knox County (740-397-0401). The following links will provide more information for this program. <http://u.osu.edu/knoxcountyag/> or <https://knox.osu.edu/>

Author(s):

[John Barker](#)

Sign-up for the Plant and Soil Nutrient Management Workshop

Auglaize County Extension will be hosting a Plant and Soil Nutrient Management Workshop on Wednesday, January 22, 2020 from 8:30 AM to 4:00 PM. The meeting will be at the Wapakoneta Eagles (25 E. Auglaize St., Wapakoneta, OH 45895). The program is free and fertilizer, CCA, and CLM credits will be offered for the program. This will be an all encompassing program with topics such as Phosphorous Management, Common Forms of Manure and When to Best Utilize Them, Micronutrients, Interpreting a Soil Test Report, Biostimulants, Growth Regulators, and More. Speakers include Harold Watters, Greg LaBarge, Glen Arnold, and Jeff Stachler.

Preregistration for the meeting is due on January 13, 2020. Call the Auglaize County Extension Office at 419-739-6580 or contact Jeff Stachler (stachler.1@osu.edu) to register for the program.

Author(s):

[Jeff Stachler](#)

Coshocton/Muskingum 2020 Agronomy School

The OSU Extension offices in Coshocton & Muskingum Counties are pleased to be offering the “**2020 Agronomy School**” on Tuesday, January 28, 2020 from 9:00 a.m. until 3:00 p.m. This school will be held at the Dresden United Methodist Church located at 1014 Main Street in Dresden.

This school will focus on topics to increase corn profitability, improve grain crop nutrient management, and understand new trends in Ohio weather. Participants will also learn more about the farm bill, commodity prices, and trade issues.

The featured speakers for this event include: Aaron Wilson, Atmospheric Scientist, Byrd Polar and Climate Research Center; Ben Brown, Program Manager for Farm Management; Glen Arnold, Field Specialist, Manure Management; and Harold Watters, Field Specialist, Agronomic Systems; Clifton Martin, OSU Extension Educator and David Marrison, OSU Extension Educator. This event is being co-sponsored by the Ohio Soybean Council.

Pre-registration for this school is required and the fee is \$30 per person. Make checks payable to Ohio State University Muskingum County. Mail to 225 Underwood Street, Zanesville, OH 43701. The registration

deadline is Wednesday, January 22, 2020. This fee includes refreshments, lunch, handouts, and a copy of Bulletin #969 – A Field Guide to Identifying Critical Resource Concerns and Best Management Practices. Pesticide and Certified Crop Advisor (CCA) credits have been applied for. Registration details can be found at muskingum.osu.edu/agronomyschool. More information can be obtained by contacting the Muskingum County Extension office at 740-454-0144 or the Coshocton County Extension Office at 740-622-2265

Author(s):

[David Marrison](#)

Other Articles

Genes controlling mycorrhizal colonization discovered in soybean

Date: January 6, 2020

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

Source: <https://www.sciencedaily.com/releases/2020/01/200106141608.htm>

Like most plants, soybeans pair up with soil fungi in a symbiotic mycorrhizal relationship. In exchange for a bit of sugar, the fungus acts as an extension of the root system to pull in more phosphorus, nitrogen, micronutrients, and water than the plant could on its own.

Mycorrhizal fungi occur naturally in soil and are commercially available as soil inoculants, but new research from the University of Illinois suggests not all soybean genotypes respond the same way to their mycorrhizal relationships.

"In our study, root colonization by one mycorrhizal species differed significantly among genotypes and ranged from 11 to 70%," says Michelle Pawlowski, postdoctoral fellow in the Department of Crop Sciences at Illinois and co-author on a new study in *Theoretical and Applied Genetics*.

To arrive at that finding, Pawlowski grew 350 diverse soybean genotypes in pots filled with spores of a common mycorrhizal fungus. After six weeks, she looked at the roots under a microscope to evaluate the level of colonization.

"It was a little bit of a gamble because we didn't know much about soybean's relationship with mycorrhizae and did not know if differences in colonization among the soybean genotypes would occur. So when we screened the soybean genotypes and found differences, it was a big relief," Pawlowski says. "That meant there was a potential to find genetic differences, too."

The process of root colonization starts before fungal spores even germinate in the soil. Roots exude chemicals, triggering spores to germinate and grow toward the root. Once the fungus makes contact, there's a complex cascade of reactions in the plant that prevents the usual defensive attack against invading pathogens. Instead, the plant allows the fungus to enter and set up shop inside the root, where it creates tiny tree-like structures known as arbuscules; these are where the fungus and plant trade sugar and nutrients.

The study suggests there is a genetic component to root colonization rates in soybean. To find it, Pawlowski compared the genomes of the 350 genotypes and honed in on six genomic regions associated with differing levels of colonization in soybean.

"We were able to use all the information we have on the soybean genome and gene expression to find possible causal genes within these six regions," she says.

According to the study, the genes control chemical signals and pathways that call fungus toward roots, allow the plant to recognize mycorrhizal fungus as a "good guy," help build arbuscules, and more. "For almost every step in the colonization process, we were finding related genes within those regions," Pawlowski says.

Knowing which genes control root colonization could lead breeders to develop soybean cultivars with a higher affinity for mycorrhizal fungus, which could mean improved nutrient uptake, drought tolerance, and disease resistance.

"This environmentally friendly approach to improving soybean production may also help reduce the overuse of fertilizers and pesticides and promote more holistic crop production systems," says Glen Hartman, plant pathologist in the Department of Crop Sciences and crop pathologist for USDA-ARS.

Experts unlock key to photosynthesis, a find that could help us meet food security demands

Date: November 13, 2019

Source: University of Sheffield

Source: <https://www.sciencedaily.com/releases/2019/11/191113153102.htm>



Green leaf in sunlight (stock image).

Credit: © Korn V. / [Adobe Stock](#)

Scientists have solved the structure of one of the key components of photosynthesis, a discovery that could lead to photosynthesis being 'redesigned' to achieve higher yields and meet urgent food security needs.

The study, led by the University of Sheffield and published today in the journal *Nature*, reveals the structure of cytochrome b6f -- the protein complex that significantly influences plant growth via photosynthesis.

Photosynthesis is the foundation of life on Earth providing the food, oxygen and energy that sustains the biosphere and human civilisation.

Using a high-resolution structural model, the team found that the protein complex provides the electrical connection between the two light-powered chlorophyll-proteins (Photosystems I and II) found in the plant cell chloroplast that convert sunlight into chemical energy.

Lorna Malone, the first author of the study and a PhD student in the University of Sheffield's Department of Molecular Biology and Biotechnology, said: "Our study provides important new insights into how cytochrome b6f

utilises the electrical current passing through it to power up a 'proton battery'. This stored energy can then be used to make ATP, the energy currency of living cells. Ultimately this reaction provides the energy that plants need to turn carbon dioxide into the carbohydrates and biomass that sustain the global food chain."

The high-resolution structural model, determined using single-particle cryo-electron microscopy, reveals new details of the additional role of cytochrome b6f as a sensor to tune photosynthetic efficiency in response to ever-changing environmental conditions. This response mechanism protects the plant from damage during exposure to harsh conditions such as drought or excess light.

Dr Matt Johnson, reader in Biochemistry at the University of Sheffield and one of the supervisors of the study added: "Cytochrome b6f is the beating heart of photosynthesis which plays a crucial role in regulating photosynthetic efficiency.

"Previous studies have shown that by manipulating the levels of this complex we can grow bigger and better plants. With the new insights we have obtained from our structure we can hope to rationally redesign photosynthesis in crop plants to achieve the higher yields we urgently need to sustain a projected global population of 9-10 billion by 2050."

The research was conducted in collaboration with the Astbury Centre for Structural Molecular Biology at the University of Leeds.

Researchers now aim to establish how cytochrome b6f is controlled by a myriad of regulatory proteins and how these regulators affect the function of this complex.

Prepared by Jeff Stachler

Ohio State University Agriculture and Natural Resources Extension Educator, Auglaize County