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Ohio State University Extension
Auglaize County
Top of Ohio EERA
208 South Blackhoof Street
Wapakoneta, OH 45895-1902

419-739-6580 Phone
419-739-6581 Fax
www.auglaize.osu.edu

Auglaize County OSU Extension Weekly Agriculture Newsletter – February 5, 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.

Joke: **Doctor, I feel like a pony??**

Rain fell four days in the past week, but only trace amounts! The average high temperature now is 35 degrees F. Temperatures for the week were below normal by 1 degree for the first 4 days and above normal for the last three days with the greatest at 24 degrees F above normal.

Wheat – I have not rated the wheat for some time. 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.

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Corn – There is still corn to be harvested in the county that I am aware of.

Soybean – Nothing to report.

Weeds – If you need help planning your herbicide program, feel free to call the office.

Insects - No report.

There WERE changes to the Engenia and XtendiMAX labels this past week. There were NO changes to the FeXapan and Tavium labels. The Engenia label still has the most approved products compared to XtendiMAX and FeXapan. Thirty-two new herbicide was added to the XtendiMAX label this past week, which totals 234 herbicides. Eleven new adjuvants were added the XtendiMAX label, now totaling 397. No new nozzles were added to the XtendiMAX label, which totals 36. Twenty-six new Drift Reducing Adjuvant (DRA's) were added to the XtendiMAX label this week, making a total of 90 DRA's. Twenty-three new nutritional products were removed from the XtendiMAX label which totals 238. Seven new products were added to the Insecticides, Fungicides, Plant Growth Regulator and Other group on the XtendiMAX label which totals 104. Ten new adjuvants were added to the Engenia label, which now totals 526. No new herbicides were added to the Engenia label, which brings the total herbicide count to 155. No new products were added to the Other category (growth regulators, and fungicides) on the Engenia label, which totals 31. No new insecticides were added to the label which currently has 31 products. Three new Drift Reducing Adjuvants (DRA's) were added to the Engenia label, which totals 118. No new nozzles were added to the Engenia label, which totals 29. Fourteen new nutritional products were added to the Engenia label which totals 219 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 47 herbicides, 77 DRA's, 258 adjuvants, 30 nutritionals, 16, insecticides, 7 fungicides, 8 other products, and 41 nozzles approved for use with Tavium.

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Upcoming Meetings

1. **H2Ohio Meeting by SWCD.** This meeting is being held on February 11, 2020 at 6:00 PM at the Auglaize County Junior Fair Building. Contact the Auglaize County SWCD at 419-738-4016 for more information.

Answer to joke: Doctor said: Don't worry, you're just a little hoarse!

Frost Seeding Legumes and Grasses
Written by Ed Lentz and Jeff Stachler

It is now time to frost seed legumes and grasses. Soils in our area have a period of thawing and freezing during the transition from winter to spring. This process can disturb and mix the upper soil layer by the swelling and shrinking properties of clay, which is abundant in many of our soils.

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Farmers take advantage of this activity by a practice that is called frost seeding. Frost seeding is the process of applying seed over an existing pasture or hay field or wheat in late winter or early spring so seed can be moved into the soil during the thawing and freezing activity.

The objective is to renovate, fill in dead spots, and improve the overall quality of the pasture without killing existing plants and starting over. Farmers may also frost seed into wheat fields to have forage for livestock after wheat harvest.

Forage seeds need to have good contact with the soil and be near the soil surface for germination and early growth. Frost seeding requires areas of bare soil to be successful.

The seeding will fail if there is too much vegetation and the seed gets caught in the residue. A farmer may prepare for a frost seeding the previous fall by reducing vegetation without killing the pasture by close grazing, low mowing, or light tillage.

Legumes are the most common species used for frost seedings. Forage legumes have excellent nutritional value for livestock and have the ability to obtain nitrogen from the atmosphere and release it for plant use. Also legume seeds are heavier than grass and have a better chance of getting through the vegetation to bare soil. Perennial ryegrass and orchardgrass frost seed the most successfully with bromegrass being intermediate and timothy and reed canarygrass the least successful.

Red clover is the most common forage legume used for frost seedings. It has good seedling vigor and tolerates a wide range of soil pH, moisture, and fertility conditions.

Red clover grows as a short-lived perennial typically lasting for two years. Newer varieties survive longer but seed costs will be higher.

Birdsfoot trefoil may be mixed with red clover. It is a persistent perennial but slow to establish and may not become a major part of the pasture until the second year after the frost seeding. However, this may work well since red clover is declining the second year.

Another popular legume is white clover. White clover is a perennial clover that thrives in the cool spring weather. It tends to be a short-growig legume and may not get adequate light for optimum growth when seeded with taller grasses. However, companies have developed newer varieties that tend be more upright.

Frost seeding rates vary among forage species. The smaller the seed the lower the seeding rate. For example the seeding rate for white clover is two to three pounds per acre and the rate for red

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clover is six to eight pounds. Seed perennial ryegrass at two to three pounds/A, orchardgrass at two to four pounds per acre, and smooth bromegrass at eight to ten pounds per acre.

A bacterial inoculum should be included in the frost seeding if the forage legume has not been grown in a pasture for several years. Inoculum insures the presence of Rhizobia bacteria, which gives the plant roots the ability to fix atmospheric nitrogen. The inoculum is generally added as a seed treatment by the seed supplier.

Common (generic) red clover used to be grown in the area and was readily available at a lower cost than branded seed. Seed production of red clover has been declining in our area for the past decade.

The cost of red clover seed has increased as a result of lower supplies of common red clover seed and the larger demand for legumes as a cover crops.

Higher seed costs and the risk of establishment failure has caused the practice of frost seeding to become less common in our area. However, there are still farmers who will take advantage of the spring thaw and freeze cycle and use frost seeding to improve pastures and provide livestock with high quality forage.

The next three to four weeks is generally the time that farmers will try to frost seed. However, the rainfall that we are experiencing and based upon the forecast, may make frost seeding more challenging this year. Saturated soils may cause seedlings to die.

C.O.R.N. Newsletter

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

Wetter Conditions Remain Favored into Spring

The outlook for February calls for near normal temperatures after the warm start with normal to above normal rainfall. That was the only change in the outlook. February looks wetter than a few weeks ago. Rainfall the next two weeks will average 1-4 inches across the state. Normal for two weeks is about 1.5 inches. You can see the consensus 16-day rainfall outlook at:

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https://www.weather.gov/images/ohrfc/dynamic/NAEFS16.apcp.mean.total.png
The spring outlook is for a chilly start but a warmer than normal finish. Above normal rainfall is in the outlook until at least May. However, it does not look as wet as 2019 at this time.

The trends in the climate models indicate a switch to hotter and drier weather as we go through summer.

You can keep up-to-date on all the NOAA climate outlooks at:

https://www.cpc.ncep.noaa.gov/
Author(s):
Jim Noel

Overwintering of Pathogens and Insects - What do Winter Temperatures Tell Us About Next Season?

Over the years we have developed databases of winter temperatures followed by scouting to indicate starting pathogen populations for Ohio.

Frogeye leaf spot – We have documented early infections and overwintering ability of the fungus, *Cercospora sojina*, that causes frogeye leaf spot. It appears that when there are less than 10 days during the months of December, January and February of less than 17 F, we have had reports of outbreaks

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of frogeye leaf spot. This occurred in fields where there was a high level of inoculum at the end of the season the same or similar moderately to highly susceptible cultivar was planted into the same field again which then initiated the epidemic that much sooner. Losses of greater than 35% in yield or very early fungicide applications were necessary.
Expecting continued warmer winter temperatures, for fields with a history of frogeye leaf spot, and no-till production systems, the first thing for farmers is to do now to mitigate losses in 2020:

1. Rotate fields with high levels of frogeye leaf spot into corn or another crop.
2. If it is still targeted for soybean, look at their soybean varieties frogeye leaf spot resistance scores. Your seed dealer will have more information. Plan now for what fields they will go into.
3. Scout the susceptible cultivars much earlier than what we have called for in the past and monitor levels.

Another pathogen that may be more prevalent after a warm winter is Stewart's bacterial wilt. This disease is transmitted to corn by corn flea beetle which survives in greater numbers in warm winters. This is a greater problem in popcorn and sweet corn as most field corn has high levels of resistance to the bacterium.

Most other field crop insect pests in Ohio are not highly influenced by winter conditions as they are well-adapted to withstand cold overwintering conditions. Once exception is Mexican bean beetle, an occasional pest of soybean (especially in central Ohio). Warm winter conditions may cause higher populations of this insect the following field season.

Author(s):
Anne Dorrance, Kelley Tilmon, Andy Michel

Tar Spot of Corn

Tar Spot, a new disease of corn caused by the fungus *Phyllachora maydis*, was reported for the first time in Ohio at the end of the 2018 growing season. At that time, it was found mostly in counties close to the Indiana border, as the disease continued to spread from the middle of country where it was first confirmed in 2015. Over the last few weeks, there have been several new, confirmed report of Tar Spot in Ohio, this time not only in the northwestern corner of the state, but also from a few fields in central and south-central Ohio. As was the case last year, disease onset was late again this year, with the first reports coming in well after R4. However, some of the regions affected last year had more fields affected this year, with much higher levels of disease severity. It could be that Tar Spot is becoming established in some areas of the state due to the fungus overwintering in crop residue from one growing season to another. This is very consistent

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with the pattern observed in parts of Indiana and Illinois where the disease was first reported. We will continue to keep our eyes out for Tar Spot, as we learn more about it and develop management strategies. You can help by looking for Tar Spot as you walk fields this fall, and please send us samples.

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What does it look like? Even though corn is drying down, if Tar Spot is present, you can still detect it on dry, senescent leaves almost as easily as you can on healthy leaves. So, please check your fields to see if this disease is present. "**Symptoms of tar spot first appear as oval to irregular bleached to brown lesions on leaves in which raised, black spore-producing structures call stroma are formed... giving the symptomatic areas of the leaf a rough or bumpy feel to the touch… resembling pustules on leaves with rust. Lesions … may coalesce to cause large areas of blighted leaf tissue. Symptoms may also be present on leaf sheaths and husks.**" As the name of the disease suggests, symptoms look like the splatter of "tar" on the leaves. In some cases, each black tar-like spot may be surrounded by a necrotic halo, forming what is referred to as "fish-eye" lesions.

What causes Tar Spot and how damaging is it? In the past, the greatest impact of this disease in terms of yield loss were observed when *P. maydis*-infected plants were co-infected with a second fungus called *Monographella maydis. In other words, the damage tended to be much more severe when the two fungi worked together to affect the plant. So far,* only the first fungus, *P. maydis*, has been reported in the US, but based on work done in Illinois, this pathology alone is capable of causing substantial yield reduction on highly susceptible hybrids when conditions are favorable and infections occur early.

Where did it come from and will it survive and become established? At this point it is still unclear as to how Tar Spot got to the US in the first place and how it continues to spread. The fungus is not known to be seed-borne or infect other plant species, so corn seeds and weeds are unlikely to be the sources of inoculum. However, the fungus can survive and be moved around on fresh and dry plant materials such as leaves and husks. In addition, since spores of the fungus can be carried be wind, it could be blowing in from neighboring states/counties/fields. Although not yet confirmed through survival studies, it appears that the fungus could be overwintering in infected crop stubble between growing seasons.

What should I do if I find Tar Spot? If you see anything that fits the description of, or resembles (Picture) Tar Spot, please inform your state specialist, field specialist, or county extension educator, but most importantly, please send samples to my lab (1680 Madison Ave, Wooster, OH) for confirmation. We will also be using your samples to study the fungus in order to develop effective management strategies.

Read more about Tar Spot of Corn at:

https://cropprotectionnetwork.org/resources/articles/diseases/tar-spot-of-corn
https://www.extension.purdue.edu/extmedia/BP/BP-90-W.pdf

Author(s):
Pierce Paul, Felipe Dalla Lana da Silva

Yield Survey Results Released

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2019 was a growing season that will stick in our memories for years to come. Figure 1 shows the accumulated precipitation compared to normal conditions across Ohio for April and May 2019. Near record spring rains across west central and northwest Ohio (seventh and third wettest on record respectively), fell on already saturated ground, contributing to unprecedented delays in planting progress. Figures 2 and 3 show the planting progress for both corn and soybean planting from 1979-2019. Planting for both crops was the slowest on record and we pushed the boundaries with planting dates extending later into the season. These conditions also led to a record 1,564,611 unplanted acres at the end of the season.

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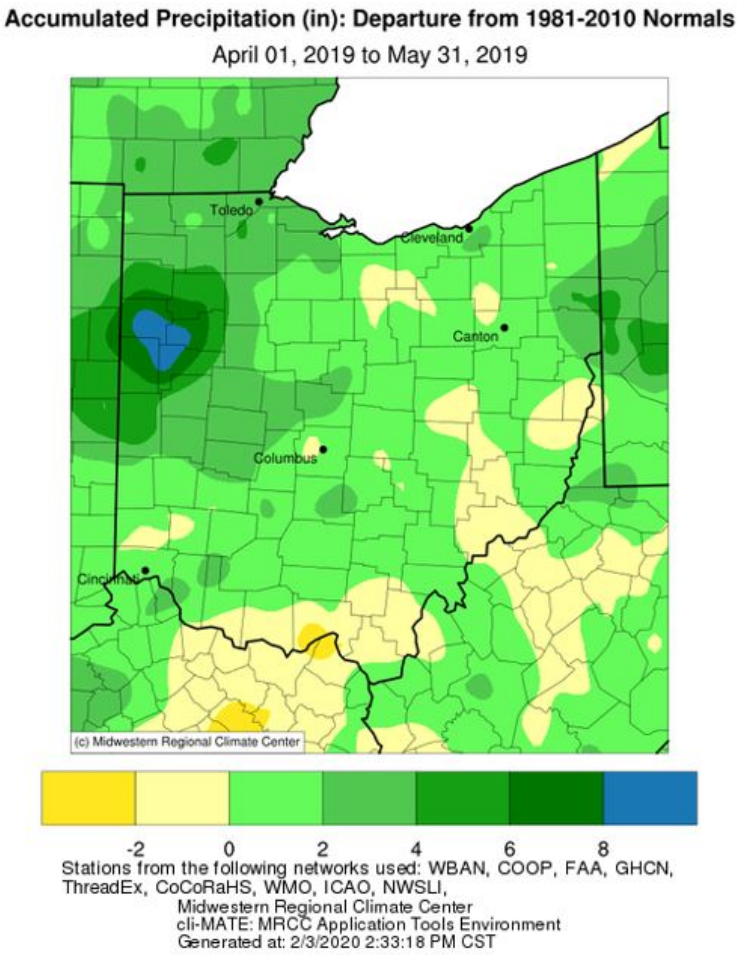

Figure 1. Accumulated precipitation (inches) departure from normal precipitation (1981-2010) for April and May 2019. Data Source: NOAA. Figure generated by the Midwestern Regional Climate Center.

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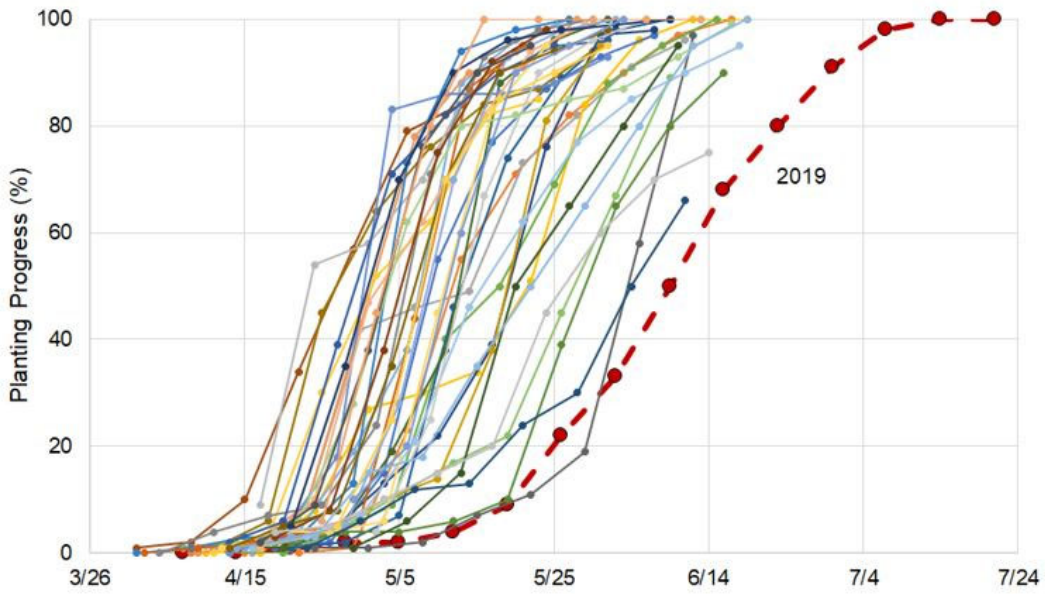

Figure 2. Ohio corn planting progress reported by USDA NASS from 1979 – 2019. 2019 progress is shown by the scarlet dashed line. Data source: USDA NASS

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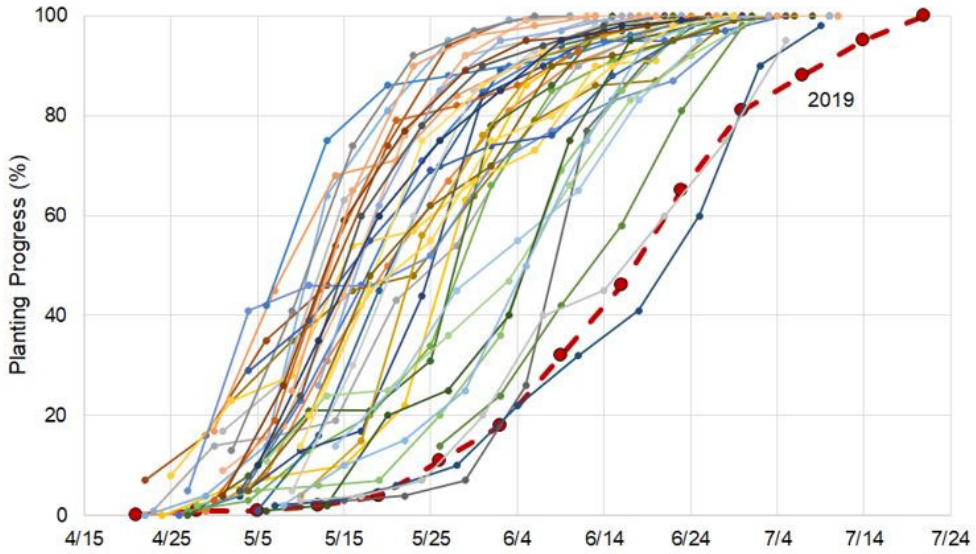

Figure 3. Ohio soybean planting progress reported by USDA NASS from 1979 – 2019. 2019 progress is shown by the scarlet dashed line. Data source: USDA NASS

The excessive rainfall during the 2019 season provided an opportunity to assess the impacts of extreme planting delays on yield in Ohio. Thanks to everyone who contributed data to the survey, we received data from 489 fields in 51 Ohio counties.

Corn Results

Reported planting dates reported ranged from 4/10 to 6/28 for corn fields, with an average planting date of 5/30. This average planting date is approximately 15 days later than USDA progress reports for 50% acres planted from 2015-2018. Table 1 shows the reported corn yield, moisture, and test weight by Ohio crop reporting district. Despite the challenging season, yields were higher than the 10-average yield reported by USDA NASS in all districts except the Central, and South Central districts. Figure 4 shows the relationship between planting date and yield. Yields trended lower as planting date was delayed.

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Table 1. Average reported corn yields, moisture, and test weight by crop reporting districts. USDA NASS 10-year average county yields included for comparison. Values in red are averaged from data from fewer than ten fields.

Crop Reporting District	# of fields		Corn Reported Averages			USDA NASS Average Yield (bu/ac; 2009-18)
	Total	Corn	Yield (bu/ac)	Moisture (%)	Test Weight (lb/bu)	
Northwest	103	32	170.3	24.1	53.1	159.9
North Central	118	55	188.7	22.6	55.4	160.5
Northeast	14	10	164.7	22.3	53.8	144.9
West Central	144	62	169.9	20.4	56.2	164.9
Central	55	29	162.8	19.2	57.2	166.3
Southwest	33	21	195.4	17.8	58.4	168.6
South Central	14	8	143.0	20.5	55.9	153.2
Southeast	10	6	162.7	17.8	57.2	147.5

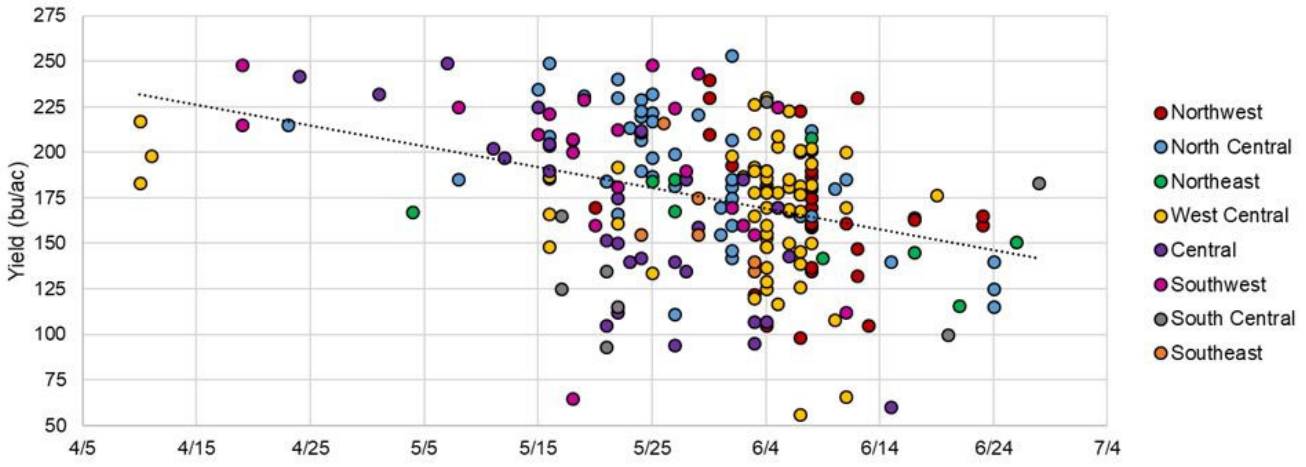

Figure 4. Corn yield by planting date. Crop reporting district is identified by color.

Soybean Results

Planting dates reported ranged from 4/4 to 7/15 for soybean fields, with an average planting date of 6/11. This was off the 2015-2018 average 50% planted progress date reported by USDA by about 19 days. Table 2 shows the reported soybean yield, moisture, and test weight by Ohio crop reporting district. Despite the

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208 South Blackhoof Street
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challenging season, yields were higher than the 10-average yield reported by USDA NASS in all districts except the West Central, Central, and Southeast districts. Figure 5 shows the relationship between planting date and yield. Yields trended lower as planting date was delayed.

Table 2. Average reported soybean yields, moisture, and test weight by crop reporting districts. USDA NASS 10-year average county yields included for comparison. Values in red are averaged from data from fewer than ten fields.

Table 2. Average reported soybean yields, moisture, and test weight by crop reporting districts. USDA NASS 10-year average county yields included for comparison. Values in red are averaged from data from fewer than ten fields.

Crop Reporting District	# of fields		Soybean Reported Averages			USDA NASS Average Yield (bu/ac; 2009-18)
	Total	Soybean	Yield (bu/ac)	Moisture (%)	Test Weight (lb/bu)	
Northwest	103	71	55.1	13.5	57.9	49.5
North Central	118	63	54.3	13.0	56.9	49.3
Northeast	14	4	46.8	13.5	57.9	45.4
West Central	144	82	50.3	12.6	58.1	52.5
Central	55	26	50.0	12.8	57.1	51.1
Southwest	33	12	56.9	11.4	58.6	50.4
South Central	14	6	60.3	13.9	56.8	46.7
Southeast	10	4	34.0	13.8	53.8	47.5

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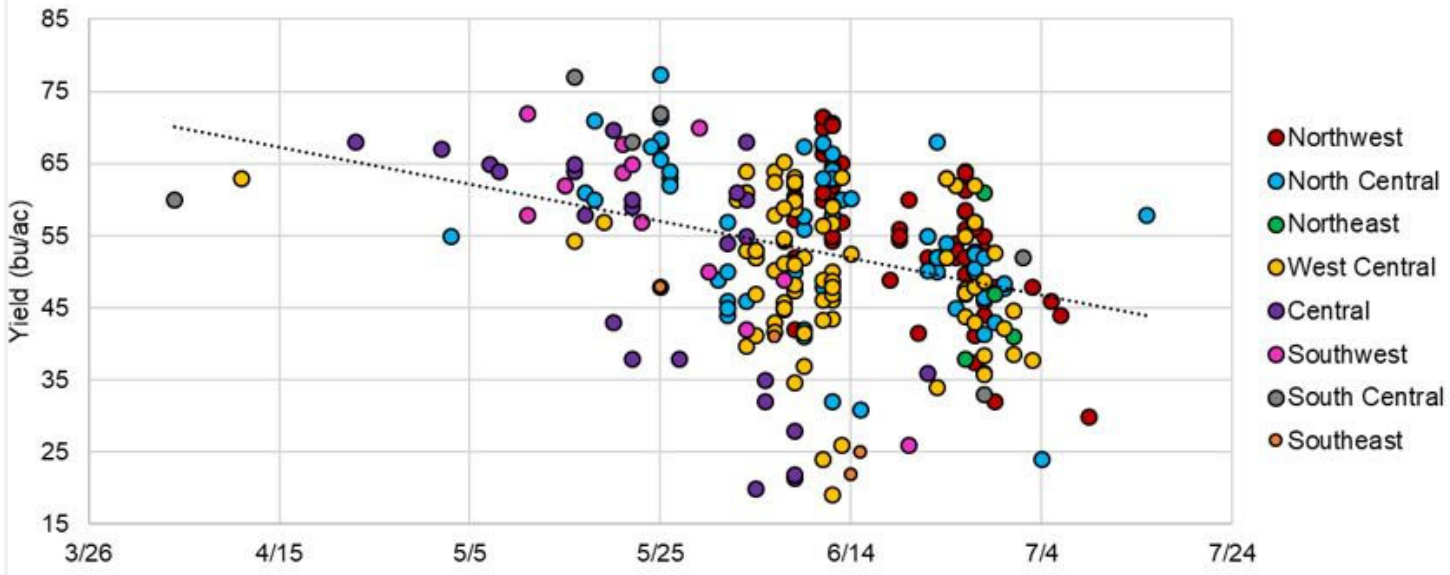

Figure 5. Soybean yield by planting date. Crop reporting district is identified by color.

Summary
Overall, reported 2019 yields, where farmers were able to plant, were higher than expected for both corn and soybeans in Ohio. While good yields were achieved at some late planted locations, the risk of yield loss increased as planting was delayed for both crops.

Author(s):
Elizabeth Hawkins, Aaron Wilson, Alexander Lindsey, Laura Lindsey, John Fulton

Are Sulfur Deficiencies Becoming More Common in Ohio?

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Sulfur is an essential macronutrient for crop production, often ranked behind only nitrogen, phosphorus, and potassium in importance. Overall, for corn and soybean, deficiencies are fairly rare. However, deficiencies can occur and are most likely on sandy soils with low organic matter (<1.0%). Much like nitrogen, the primary form of sulfur in the soil is found in the organic fraction, and the form taken up by plants (sulfate) is highly mobile. For every 1 percent of organic matter, there is approximately 140 pounds of sulfur, most of which is unavailable. Like nitrogen, sulfur must be mineralized to become plant available. (Plants may exhibit sulfur deficiencies under cool, wet conditions when mineralization is slow.) Historically, sulfur was deposited in large quantities from rainfall primarily due to burning of fossil fuels. However, emission standards have resulted in a sharp decrease in sulfur deposition from the atmosphere. As this trend continues, coupled with higher yielding crops, sulfur fertilization may become more important in the future.

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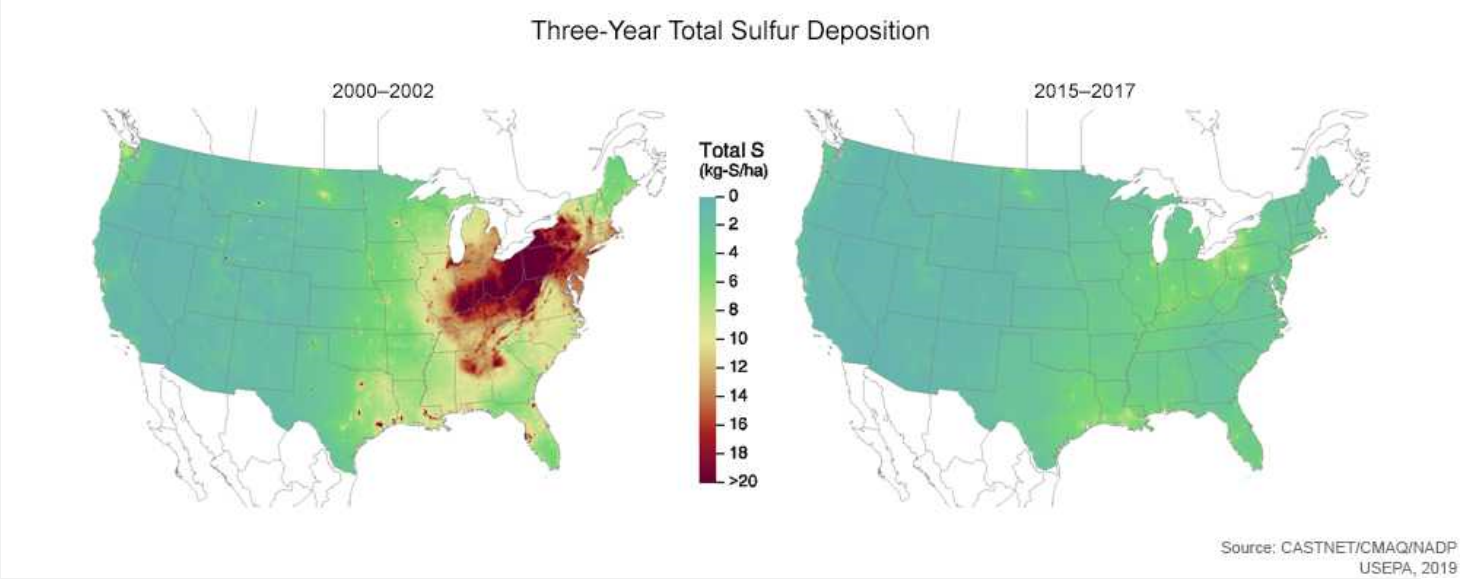

Figure 1. Sulfur deposition maps from 2000-2002 and 2015-2017 (USEPA, 2019).

A common question these days, is 'Do I need to fertilize with sulfur?' Table 1 summarizes on-farm sulfur trials conducted in Ohio from 2016 through 2019. Overall, only one trial (out of eight) resulted in a yield increase due to sulfur application (3 bu/acre in soybean). In addition to these on-farm trials, sulfur (applied as gypsum) did not increase yield in sixteen different environments across Ohio in studies conducted in 2013 and 2014. Lack of yield response is likely due to soils with organic matter levels >1%. (In our sixteen-environment study, soil organic matter levels ranged from 2.0 to 5.1%).

Table 1. Summary on on-farm sulfur trials in corn and soybean from 2016-2019.

Year	County	Crop	Sulfur Source, Rate, and Timing	Yield Response?	Reference
2019	Madison	Soybean	Thio-sul at V3	None	Nate Douridas (eFields report)

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2019	Crawford	Soybean	Thiosulfate, 20 lb S/acre, starter	+3 bu/acre	Jason Hartschuh (eFields report)
2019	Darke	Soybean	AMS, R1 and R3	None	Sam Custer (eFields report)
2018	Darke	Corn	Starter	None	Sam Custer (On-Farm Report)
2017	Darke	Corn	Starter	None	Sam Custer (On-Farm Report)
2017	Darke	Corn	Ammonium thiosulfate, 20 and 40 lb S/acre, starter and sidedress)	None	Sam Custer (On-Farm Report)
2016	Muskingum	Corn	Starter	None	Clifton Martin & Van Slack (On-Farm Report)
2016	Darke	Corn	Starter	None	Sam Custer (On-Farm Report)

Sulfur deficiency symptoms are similar to nitrogen, but unlike nitrogen, chlorosis (yellowing) is more visible on newer, upper leaves. If you think your crop is deficient in sulfur, plant tissue testing is the best way to assess. (Sulfur soil analysis is not recommended.) If possible, collect plants exhibiting deficiency symptoms and also plants not exhibiting deficiency symptoms for comparison.

Author(s):
Laura Lindsey, Steve Culman

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Learn More about eFields at Regional Meetings

Have you been enjoying the 2019 eFields Report and are excited to learn more? The Ohio State Digital Ag team is hosting six regional eFields meetings this winter. Join us to learn more about the eFields program and results we are seeing across the state. Each meeting will feature presentations highlighting local trials including seeding rate, nutrient management, and crop management. There will be a panel discussion featuring cooperating farmers who are conducting on-farm research with Ohio State Extension. We would also like to hear from you about what topics you are interested in seeing in eFields in the future.

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

Author(s):
Elizabeth Hawkins

H2Ohio Meetings Scheduled for February

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Ohio State University Extension
Auglaize County
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208 South Blackhoof Street
Wapakoneta, OH 45895-1902

419-739-6580 Phone
419-739-6581 Fax
www.auglaize.osu.edu

The Ohio Department of Agriculture is rolling out the H2Ohio plan this month at eight meetings in the Maumee River Watershed. Farmers living in the following 14 northwest Ohio counties will be eligible to apply for funds at their local Soil and Water Conservation Districts (SWCD) starting this week: Allen, Auglaize, Defiance, Fulton, Hancock, Hardin, Henry, Lucas, Mercer, Paulding, Putnam, Van Wert, Williams, and Wood. Soil and water Conservation Districts will be the first contact for farmers interested in the available funding.

There is a series of meetings in February for farmers to learn more about the program.

Meeting dates and locations are:

February 4
3 p.m.
Owens Community College
Veterans Hall
30335 Oregon Road
Perrysburg

February 5
2 p.m.
Delphos Eagles
1600 E. 5th Street
Delphos

February 5
6 p.m.
Defiance K of C Hall

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111 Elliott Road
Defiance

February 11
6 p.m.
Auglaize Co. Jr. Fair Bldg.
1001 Fairview Drive
Wapakoneta

February 18
6 p.m.
American Legion Hall
601 N. 2nd St.
Coldwater

February 20
6 p.m.
Fogle Center
815 E. Mathias St.
Leipsic

February 27
6 p.m.
Kissell Community Bldg.
509 N. Main Street
West Unity

February 28
9:30 a.m.
Ohio Northern University
McIntosh Center
525 S. Main Street
Ada

Farmers are strongly encouraged to contact their local SWCD offices by March 31st to get the process started. A Voluntary Nutrient Management Plan is required and only farm fields with soil phosphorus test levels of 50ppm (Bray P-1) or lower will be eligible for funded practices. The first seven practices eligible for funding are: Nutrient Management Plans, Variable-Rate Fertilizer, Subsurface Nutrient Application, Manure Incorporation, Conservation Crop Rotation, Cover Crops, and Drainage Water Management.

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The website to learn more about the program and the practices being funded is http://h2.ohio.gov/

Author(s):
Glen Arnold, CCA

Fertilizer Applicator Certification Training

A three-hour fertilizer certification program will be held in Richwood for any private or commercial applicator who needs to obtain fertilizer certification for the first time. This training will be held at Richwood Marketing, 15 E. Ottawa Street, Richwood, Ohio on Wednesday, February 12. The class will begin at 1:00 and end at 4:00 pm. There is a $30 class fee payable to OSU Extension for this training.

Please arrive early so that materials can be distributed and the program can start on time. This training will meet the fertilizer certification requirements for those with and without a pesticide license. Pre-registration is suggested by calling the Hardin County OSU Extension office at 419-674-2297 or the Union County Extension office at 937-644-8117. Online registration is available at https://nutrienteducation.osu.edu/NutedWC.
Agricultural fertilizer applicator certification is required in Ohio for farmers who apply fertilizer to more than 50 acres of agricultural production grown primarily for sale. This requirement was signed into law in June 2014, and also requires certification for commercial agricultural fertilizer applicators. Farmers who have their fertilizer applied by co-ops or custom applicators are not required to be certified.

Applicators who are a Certified Crop Adviser (CCA) or Certified Livestock Manager (CLM) are not required to attend the training. Fertilizer is defined for the regulation as any substance containing nitrogen, phosphorus, potassium, or other plant nutrient in a dry or liquid formulation. All application types such as broadcast, side dress, sub-surface, knifing and other are included in the certification requirement. Lime and limestone are not included as fertilizer for the certification and farmers who only use starter fertilizer in their planter boxes are exempted.

The agriculture fertilizer certification is not required for manure applications, unless farmers are applying livestock or poultry manure from a Concentrated Animal Feeding Facility (CAFF). In this case, they would need to have either the CLM or Ohio Fertilizer Certification.

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The Ohio Department of Agriculture is the agency issuing the certification for agriculture fertilizer applications. Once an applicator completes the fertilizer training, the ODA will bill them $30 for their fertilizer certificate unless the applicator currently holds a pesticide applicator license.

The ODA website has information regarding the regulation at agri.ohio.gov. For more information about other training sessions or general materials for the agriculture fertilizer certification, visit nutrienteducation.osu.edu or contact Mark Badertscher, Hardin County OSU Extension at badertscher.4@osu.edu or Wayne Dellinger, Union County OSU Extension at dellinger.6@osu.edu.

Author(s):
Mark Badertscher, Wayne Dellinger

2020 Agronomy School: The Nuts & Bolts of Corn & Soybean Production

Corn and soybeans

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

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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, Marestail, 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.

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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, Cubbage 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

Other Articles

Speedy recovery: New corn performs better in cold

Date: January 29, 2020
Source: Boyce Thompson Institute
Source: https://www.sciencedaily.com/releases/2020/01/200129174528.htm

Nearly everyone on Earth is familiar with corn. Literally.

Around the world, each person eats an average of 70 pounds of the grain each year, with even more grown for animal feed and biofuel. And as the global population continues to boom, increasing the amount of food grown on the same amount of land becomes increasingly important.

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One potential solution is to develop crops that perform better in cold temperatures. Many people aren't aware that corn is a tropical plant, which makes it extremely sensitive to cold weather. This trait is problematic in temperate climates where the growing season averages only 4 or 5 months -- and where more than 60% of its 1.6 trillion pound annual production occurs.

A chilling-tolerant strain could broaden the latitudes in which the crop could be grown, as well as enable current farmers to increase productivity.

A group of researchers led by David Stern, president of the Boyce Thompson Institute, have taken a step closer to this goal by developing a new type of corn that recovers much more quickly after a cold snap. Stern is also an adjunct professor of plant biology in Cornell University's College of Agriculture and Life Sciences.

The research is described in a paper published online in *Plant Biotechnology Journal* on December 20.

This work built on research published in 2018, which showed that increasing levels of an enzyme called Rubisco led to bigger and faster-maturing plants. Rubisco is essential for plants to turn atmospheric carbon dioxide into sugar, and its levels in corn leaves decrease dramatically in cold weather.

In the latest study, Stern and colleagues grew corn plants for three weeks at 25°C (77°F), lowered the temperature to 14°C (57°F) for two weeks, and then increased it back up to 25°C.

"The corn with more Rubisco performed better than regular corn before, during and after chilling," said Coralie Salesse-Smith, the paper's first author. "In essence, we were able to reduce the severity of chilling stress and allow for a more rapid recovery." Salesse-Smith was a Cornell PhD candidate in Stern's lab during the study, and she is now a postdoctoral researcher at the University of Illinois.

Indeed, compared to regular corn, the engineered corn had higher photosynthesis rates throughout the experiment, and recovered more quickly from the chilling stress with less damage to the molecules that perform the light-dependent reactions of photosynthesis.

The end result was a plant that grew taller and developed mature ears of corn more quickly following a cold spell.

Steve Reiners, a co-team leader for Cornell Cooperative Extension's vegetable program, says that sweet corn is a major vegetable crop in New York, worth about $40-$60 million annually. He notes that many New York corn growers plant as soon as they can because an early crop commands the highest prices of the season.

Reiners, who was not involved in the study, is also a professor of horticulture at Cornell.

"The corn we developed isn't yet completely optimized for chilling tolerance, so we are planning the next generation of modifications," said Stern. "For example, it would be very interesting to add a chilling-tolerant version of a protein called PPDK into the corn and see if it performs even better."

The researchers believe their approach could also be used in other crops that use the C4 photosynthetic pathway to fix carbon, such as sugar cane and sorghum.

Co-authors on the paper include researchers from The Australian National University in Canberra.

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The study was supported by the U.S. Department of Agriculture's National Institute of Food and Agriculture (2016-67013-24464) and Australian Research Council Centre of Excellence for Translational Photosynthesis (CE1401000015).

Prepared by Jeff Stachler
Ohio State University Agriculture and Natural Resources Extension Educator, Auglaize County