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Auglaize County OSU Extension Weekly Agriculture Newsletter – December 11, 2019

Scouting and Latest Information

2-leaf wheat

Worked soybean stubble

Hello!! Good afternoon! I pray you are well. Sorry for the delay, but I was in meetings Tuesday and Wednesday.

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.

OSU Extension is conducting a survey. Please take some time to read the information below and please participate in the survey! If we get enough of you to complete this survey we will get a county report, so please help out!! A hard copy will be attached with the e-mail if you need that format:

Attached is the 2019 Yield Survey that will be shared in this week's CORN newsletter. There are two ways to complete the survey: 1. a Qualtrics survey that can be accessed at go.osu.edu/yield19, or 2. completing the attached paper form and returning to Elizabeth Hawkins (by email: Hawkins.301@osu.edu or US mail: 111 S. Nelson Ave, Suite 2, Wilmington, OH 45177).

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We would like to gather information for as many fields as possible, in as many counties as possible to maximize what we can learn from 2019 and the planting delays caused by the excessive rainfall. The results will be summarized and shared with you. The survey needs to be completed by December 31, 2019 to ensure we will have the information available for use at your local meetings this winter. If you have any questions, please don't hesitate to ask.

Joke: **Why are farmers cruel???**

Rain fell only one day this past week, but a food dose. Rainfall for Tuesday, December 10th, ranged from 0.4" near Bloody Bridge to 0.7" at about 1 mile north of St. Marys. The range in rainfall for the week the rainfall for Tuesday. The average rainfall for the week was 0.55". The average high temperature should now be around 40 degrees F, a 3-degree drop from last week. Temperatures were above normal every day this past week with some into the 50's.

Tasks for the week were minimal but included: fall tillage, hauling manure, harvesting corn, spreading fertilizer and other amendments, and tiling fields.

Wheat – I rated 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 – All corn is at the R6 (black layer) stage. We now have about 99% of the corn harvested in the county.

Soybean – All are harvested that I am aware of.

Weeds – Nothing to report

Insects - No report.

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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 152 herbicides. No new adjuvant was added the XtendiMAX label, now totaling 344. No new nozzles were added to the XtendiMAX label, which totals 37. No new Drift Reducing Adjuvant (DRA's) was added to the XtendiMAX label this week, making a total of 58 DRA's. No new nutritional products were removed from the XtendiMAX label which totals 203. No new products were added to the Insecticides, Fungicides, Plant Growth Regulator and Other group on the XtendiMAX label which totals 61. No new adjuvants were added to the Engenia label, which now totals 485. No new herbicides were added to the Engenia label, which brings the total herbicide count to 144. 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 105. 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!!

1. **Pesticide Applicator Exam Preparation Course.** This meeting will be held **December 5, 2019** from 8:30 AM to 12:30 PM at the Auglaize County Administration Building in the basement room. Check flyer for additional details.

2. **Pesticide Applicator Exam.** The ODA will be at the Auglaize County Administration Building in the basement room (209 S. Blackhoof St.) on **December 12, 2019** starting at 10:00 AM to offer exams to commercial and private applicators. Register for the testing date as soon as possible by calling ODA (614-728-6987) or by going on line at:

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https://agri.ohio.gov/wps/portal/gov/oda/divisions/plant-health/pesticides/exam-registration **Please register right away as the room is filling up!!**

3. **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.

4. **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.

5. **Plant and Soil Nutrient Management.** This meeting will be held **January 22, 2020**. The exact starting time has not been determined but it will be an all day meeting. The location will be the Eagles in Wapakoneta. This meeting will talk about all aspects of nutrient management.

Extra Information:
The passage below was given to me by a farmer in the county and written by Brett Stein Business Manager for IBEW Local Union 32:

A young man applied for a job as a farmhand. When the farmer asked for his qualifications, he said, "I can sleep through a storm." This puzzled the farmer… but he liked the young man, so he hired him. A few weeks later, the farmer and his wife were awakened in the night by a violent storm ripping through the valley. He leapt out of bed and called for his new hired hand, but the your man was sleeping soundly. So they quickly began to check things to see if all was secure. They found that the shutters of the farmhouse had been securely fastened. A good supply of log had been set next to the fire place. The farmer and his wife then inspected their property. They found that the farm tools had been placed in the storage shed, safe from the elements. He sees that the bales of wheat had been bound and wrapped in tarpaulins. The tractor had been moved into its garage. The barn was properly locked tight. Even the animals were calm and had plenty of feed. All was well. The farmer then understood the meaning of the young man's words, "I can sleep through any storm." Because the farmhand did his work loyally and faithfully when the skies were clear, he was prepared for any storm. So when the storm did actually break, he was not concerned or afraid. He could

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sleep in peace…. Live your life… do your work… in such a manner in which you can sleep through the storm.

Answer to joke: Because they pull corn by the ears!

One Year Later, Tar Spot is Spreading in Ohio Corn Fields

Tar Spot

Hybrid variability to tar spot

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Tar spot arrived in Ohio corn fields for the first time in 2018! In 2019 it spread farther east and west of 2018 area of northwest Ohio. I did not see any of it in Auglaize county this fall and did not hear of any in the county! This disease was first confirmed in the United States in 2015 in Indiana and Illinois and has spread to surrounding states. The disease has now been confirmed in Wisconsin, Illinois, Iowa, Michigan, Ohio, and Florida

Tar spot of corn is caused by the fungus *Phyllachora maydis*. In Latin America *Phyllachora maydis* is usually found in a complex with *Monographella maydis* and *Coniothyrium phyllachorae*, but these two pathogens have not been identified in the United States. It usually takes the presence of these two pathogens to cause epidemics of the disease, but that was not the case again this season as severe infestations were found in Indiana, Illinois, and Wisconsin.

The disease is identified by the small, raised, black, irregular or circular spots found on corn leaves, leaf sheaths, and husks. These lesions are fungal structures called ascomata. The ascomata can appear on both healthy and dead tissue and are often surrounded by a narrow tan halo. Leaves may have very few ascomata or it can become very dense over the leaf. Tar spot lesions can be confused with the black pustules that corn rust produces. It can also be confused with the black saprophytic organisms found on corn leaves, but this can be rubbed off the leaf compared to the tar spot lesions that will not be rubbed off.

Tar spot is favored by cool conditions (60-70 degrees F) and high humidity (averages above 75%). Wind-driven rain and storms can spread the tar spot. The fungus is not known to be seedborne. The pathogen does not survive well in the absence of a plant host such as corn.

There are still many unknowns about tar spot in the United States. Does it form complexes with other fungi like it does in Latin America? This past year there are some suspicions that the tar spot fungus may be forming a complex with grey leaf spot as it was found to be worse in Wisconsin where fields had more tar spot where grey leaf spot was already present, but this has not been confirmed yet.

In Latin America corn yields can be reduced by as much as 30%. In preliminary research in the United States corn yields have been reduced by as much as 40%. It is known that the tar spot fungus can reduce ear weight and grain size. Corn made for silage may be most effected because it may cause premature death of the leaf and cause the silage to be drier than expected. Based upon current information there does not appear to be any mycotoxins associated with the fungus.

In one research trial Proline and Delaro reduced the tar spot disease severity while Headline did not. However, grain yield was the same for all treatments. Therefore more work needs to be done on the effectiveness of fungicides in controlling tar spot. We now know there is variability in corn hybrid susceptibility, so more work needs to be done to characterize the possibility of resistance in corn hybrids.

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All we can do now is to ask corn suppliers if corn hybrids have resistance or tolerance to tar spot and to diligently scout corn fields in 2020 for the presence of the disease. Please watch closely next season and report its presence to me.

C.O.R.N. Newsletter

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

No news this week

Other Articles

Large atmospheric waves in the jet stream present risk to global food production

Date: December 9, 2019
Source: University of Oxford
Source: https://www.sciencedaily.com/releases/2019/12/191209112147.htm

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Drought in a corn field (stock image).

Credit: © Scott / Adobe Stock

In a new study published today in *Nature Climate Change*, scientists show how specific wave patterns in the jet stream strongly increase the chance of co-occurring heatwaves in major food producing regions of Northern America, Western Europe and Asia. Their research finds that these simultaneous heatwaves significantly reduce crop production across those regions, creating the risk of multiple harvest failures and other far-reaching societal consequences, including social unrest.

Lead author, Dr Kai Kornhuber from the University of Oxford's Department of Physics and Colombia University's Earth Institute, said: "Co-occurring heatwaves will become more severe in the coming decades if greenhouse gases are not mitigated. In an interconnected world, this can lead to food price spikes and have impacts on food availability even in remote regions not directly affected by heatwaves.

"We found a 20-fold increase in the risk of simultaneous heatwaves in major crop producing regions when these global scale wind patterns are in place. Until now this was an underexplored vulnerability in the food system. We

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have found that during these events there actually is a global structure in the otherwise quite chaotic circulation. The bell can ring in multiple regions at once and the impacts of those specific interconnections were not quantified previously."

Western North America, Western Europe and the Caspian Sea region are particularly susceptible to these atmospheric patterns that get heat and drought locked into one place simultaneously where they then affect crops production yields.

Dr Dim Coumou, co-author from the Institute for Environmental Studies at VU Amsterdam, said: "Normally low harvests in one region are expected to be balanced out by good harvests elsewhere but these waves can cause reduced harvests in several important breadbaskets simultaneously, creating risks for global food production."

Dr Elisabeth Vogel, co-author from Melbourne University, said: "During years in which two or more summer weeks featured the amplified wave pattern, cereal crop production was reduced by more than 10% in individual regions, and by 4% when averaged across all crop regions affected by the pattern."

Dr Radley Horton, co-author from the Lamont-Doherty Earth Observatory at Colombia University, said: "If climate models are unable to reproduce these wave patterns, risk managers such as reinsurers and food security experts may face a blind spot when assessing how simultaneous heat waves and their impacts could change in a warming climate."

The scientists conclude that a thorough understanding of what drives this jet stream behaviour could ultimately improve seasonal predictions of agricultural production at the global scale and inform risk assessments of harvest failures across multiple food-producing regions.

As a way to fight climate change, not all soils are created equal

Recognizing diversity of soil organic matter can help science and agriculture move forward with carbon sequestration

Date: December 4, 2019
Source: Colorado State University
Source: https://www.sciencedaily.com/releases/2019/12/191204100537.htm

As the planet warms due to excess carbon dioxide in the atmosphere, a solution for drawing down that carbon -- or at least a major part of it -- lies silently below us.

Soil organic matter -- made of decomposing plant, animal and microbial tissue -- is what distinguishes healthy, vibrant soil from just plain dirt. Making up about 3% of productive agricultural soils, soil organic matter is an effective "carbon sink" that can store, in the ground, the carbon dioxide plants pull from the atmosphere. Along with reducing fossil fuel emissions, employing soils as vast carbon sinks is considered a key strategy in combating climate change.

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Accruing soil organic matter effectively and sustainably requires a deeper understanding of its formation, persistence and function. And according to Colorado State University scientists, not all soil organic matter is created equal.

A set of studies led by CSU soil scientist Francesca Cotrufo offers a newly nuanced understanding of different soil organic matter components that can be increased through varied management strategies. Publishing in Global Change Biology, Cotrufo and co-authors Jocelyn Lavallee and Jennifer Soong establish a framework for classifying soil organic matter into two broad categories that are fundamentally different in origin and makeup. In a related study in *Nature Geoscience*, Cotrufo led an experimental and statistical survey of these soil organic matter components across European forests and grasslands.

Only by recognizing the diversity of soil organic matter can science, government and agriculture move forward with carbon sequestration to help reverse the tide of climate change while increasing the health of our soils, the scientists say.

"Because of thousands of years of historical land use and conventional agriculture, we have contributed to consuming soil organic matter and emitting carbon from the soil into the atmosphere," says Cotrufo, a professor in the Department of Soil and Crop Sciences and senior scientist in the Natural Resource Ecology Laboratory. "Now, we have the opportunity to put it back."

That opportunity, Cotrufo and colleagues say, comes with thinking of soil organic matter as having two major components.

The first is called "particulate organic matter," made up of lightweight, partly decomposed plants and fungi residues that are short-lived and not well protected.

The second is "mineral-associated organic matter," largely made of byproducts of the decomposition of microbes that chemically bind to minerals in the soil. This type of matter is more resilient and able to persist in the ground for centuries.

Insights around the formation of these different classes of soil sprouted from previous work Cotrufo published in 2013, establishing a "microbial-efficiency mineral-stabilization framework" that transformed the way scientists understand how organic matter persists in soils. Cotrufo and colleagues proposed that microbial decomposition of plant matter can act as a stabilizer for soil organic matter; it was previously thought that preserving carbon in soil would require halting decomposition.

Cotrufo calls particulate organic matter the "checking account" of soils. It turns over continuously and supports nutrient cycling but requires regular deposits to stay vital. Mineral-associated organic matter, then, is the "savings account": it gets a smaller fraction of deposits but is inherently more stable.

Conventional agriculture, Cotrufo says, has caused us to exhaust our checking account and start living off our savings. This happens because of farms selecting few crops with minimal root production, harvesting much of the above-ground biomass, and maintaining few and chemically homogenous plant inputs into the soils.

By taking cues from nature and understanding how natural prairies and forests manage their soil checking and savings accounts, more forward-thinking strategies are possible for upending farming and land use to be more sustainable, Cotrufo says. To regenerate healthy soil that can capture excess carbon, both types of soil pools must be augmented, she adds.

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Writing in *Nature Geoscience*, the researchers showed that European grasslands and forests with symbiotic partnerships between fungi and plants store more soil carbon in nitrogen-demanding mineral-associated organic matter. But forests that depend on symbiosis with other fungal species store more carbon in particulate organic matter, which is more vulnerable to disturbance, but has a lower nitrogen demand and can accumulate carbon indefinitely.

Cotrufo will continue researching how particulate and mineral-associated soil organic matter are distributed, with plans to incorporate U.S. land surveys into her datasets. Cotrufo was also recently named the Nutrien Distinguished Scholar of Agricultural Sciences at CSU, a one-year award of $12,000 reserved for distinguished faculty who are making significant impacts in their fields.

Cotrufo recently gave a talk on soil as "humanity's capital" at The Land Institute, where she provided insight into her early stake in soil science, and how the field has evolved over her career.

Reduced soil tilling helps both soils and yields

Date: December 6, 2019
Source: Stanford University
Source: https://www.sciencedaily.com/releases/2019/12/191206132228.htm

Agriculture degrades over 24 million acres of fertile soil every year, raising concerns about meeting the rising global demand for food. But a simple farming practice born from the 1930's Dust Bowl could provide a solution, according to new Stanford research. The study, published Dec. 6 in *Environmental Research Letters*, shows that Midwest farmers who reduced how much they overturned the soil -- known as tilling -- increased corn and soybean yields while also nurturing healthier soils and lowering production costs.

"Reduced tillage is a win-win for agriculture across the Corn Belt," said study lead author Jillian Deines, a postdoctoral scholar at Stanford's Center on Food Security and the Environment. "Worries that it can hurt crop yields have prevented some farmers from switching practices, but we found it typically leads to increased yields."

The U.S. -- the largest producer of corn and soybeans worldwide -- grows a majority of these two crops in the Midwest. Farmers plucked about 367 million metric tons of corn and 108 million metric tons of soybeans from American soil this past growing season, providing key food, oil, feedstock, ethanol and export value.

Monitoring farming from space

Farmers generally till the soil prior to planting corn or soybeans -- a practice known to control weeds, mix nutrients, break up compacted dirt and ultimately increase food production over the short term. However, over time this method degrades soil. A 2015 report from the Food and Agriculture Organization of the United Nations found that in the past 40 years the world has lost a third of food-producing land to diminished soil. The demise of

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once fertile land poses a serious challenge for food production, especially with mounting pressures on agriculture to feed a growing global population.

In contrast, reduced tillage -- also known as conservation tillage -- promotes healthier soil management, reduces erosion and runoff and improves water retention and drainage. It involves leaving the previous year's crop residue (such as corn stalks) on the ground when planting the next crop, with little or no mechanical tillage. The practice is used globally on over 370 million acres, mostly in South America, Oceania and North America. However, many farmers fear the method could reduce yields and profits. Past studies of yield effects have been limited to local experiments, often at research stations, that don't fully reflect production-scale practices.

The Stanford team turned to machine learning and satellite datasets to address this knowledge gap. First, they identified areas of reduced and conventional tilling from previously published data outlining annual U.S. practices for 2005 to 2016. Using satellite-based crop yield models -- which take into account variables such as climate and crop life-cycles -- they also reviewed corn and soybean yields during this time. To quantify the impact of reduced tillage on crop yields, the researchers trained a computer model to compare changes in yields based on tillage practice. They also recorded elements such as soil type and weather to help determine which conditions had a larger influence on harvests.

Improved yields

The researchers calculated corn yields improved an average of 3.3 percent and soybeans by 0.74 percent across fields managed with long-term conservation tillage practices in the nine states sampled. Yields from the additional tonnage rank in the top 15 worldwide for both crops. For corn, this totals approximately 11 million additional metric tons matching the 2018 country output of South Africa, Indonesia, Russia or Nigeria. For soybeans, the added 800,000 metric tons ranks in between Indonesia and South Africa's country totals.

Some areas experienced up to an 8.1 percent increase for corn and 5.8 percent for soybeans. In other fields, negative yields of 1.3 percent for corn and 4.7 for soybeans occurred. Water within the soil and seasonal temperatures were the most influential factors in yield differences, especially in drier, warmer regions. Wet conditions were also found favorable to crops except during the early season where water-logged soils benefit from conventional tillage that in turn dries and aerates.

"Figuring out when and where reduced tillage works best could help maximize the benefits of the technology and guide farmers into the future," said study senior author David Lobell, a professor of Earth system science in the School of Earth, Energy & Environmental Sciences and the Gloria and Richard Kushel Director of the Center on Food Security and the Environment.

It takes time to see the benefits from reduced tillage, as it works best under continuous implementation. According to the researchers' calculations, corn farmers won't see the full benefits for the first 11 years, and soybeans take twice as long for full yields to materialize. However, the approach also results in lower costs due to reduced need for labor, fuel and farming equipment while also sustaining fertile lands for continuous food production. The study does show a small positive gain even during the first year of implementation, with higher gains accruing over time as soil health improves. According to a 2017 Agricultural Censuses report, farmers appear to be getting on board with the long-term investment and close to 35 percent of cropland in the U.S. is now managed with reduced tillage.

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"One of the big challenges in agriculture is achieving the best crop yields today without comprising future production. This research demonstrates that reduced tillage can be a solution for long-term crop productivity," Deines said.

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