THE OHIO STATE UNIVERSITY

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Auglaize County OSU Extension Weekly Agriculture Newsletter – February 26, 2020

Scouting and Latest Information

Hello!! Good afternoon! 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.

We are quickly nearing the end of the farm bill sign up. Get into the office or call to make an appointment. If you do not get an appointment prior to March 15th, then you will not receive any 2019 payments that may be available!! If you need help deciding what to do, feel free to contact the Extension Office for an appointment or visit the following web address for the decision aid tools: https://aede.osu.edu/research/osu-farm-management/2018-farm-bill/arcplc-decision-aid-tools

I'm looking for people to conduct research with me this season, especially research on waterhemp. Please contact me soon so we can get things lined up. If you have any suggestions on research, let me know.

If anyone is interested there is a grower in the county that would like to hire someone to do some strip tillage this spring as he will not have time to plant and make strips at the same time. If you are interested in doing this or know of someone who is interested, please contact me and I will get you in touch with the farmer.

I have another farmer looking for a 750 or 1000 gallon stainless steel tank to mix pesticides into while the sprayer is running.

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Joke: **Who tells chicken jokes??**

Rain fell two days in the past week! Rainfall on Tuesday, February 18th ranged from 0" near County Road 66A and St. Rt. 66, near Lowes, and near Lock 2 and Tri-Township Roads to 0.17" near Bloody Bridge. Rainfall on Monday ranged from 0.1" near Uniopolis to 0.35" near Lock 2 and Tri-Township roads Rainfall for the week ranged from 0.2" near County Road 66A and St.Rt. 66 and near Uniopolis to 0.37" near Bloody Bridge. Rainfall for the week averaged 0.3", a little less than half of last week.

The average high temperature now is 40 degrees F, two more than last week! It is now in the 40's!! Temperatures were above normal for 4 days of the week and below normal for 3 days of the week. The average high temperature for the week was 39.8 degrees F, which is near the average.

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.

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

Soybean – Nothing to report.

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

Insects - No report.

There were changes to the Engenia Label this past week. There were NO changes to the XtendiMAX, 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 234 herbicides. No new adjuvants were added the XtendiMAX label, now totaling 397. No new nozzles were added to the XtendiMAX label, which totals 36. No new Drift Reducing Adjuvant (DRA's)

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were added to the XtendiMAX label this week, making a total of 90 DRA's. No new nutritional products were added from the XtendiMAX label which totals 238. No new products were added to the Insecticides, Fungicides, Plant Growth Regulator and Other group on the XtendiMAX label which totals 104. Twenty-Three new adjuvants were added to the Engenia label, which now totals 549. Five new herbicides were added to the Engenia label, which brings the total herbicide count to 160. No new products were added to the Other category (growth regulators, and fungicides) on the Engenia label, which totals 31. Three new insecticides were added to the label which currently has 34 products. One new Drift Reducing Adjuvants (DRA's) were added to the Engenia label, which totals 119. Two new nozzles were added to the Engenia label, which totals 31. Three new nutritional products were added to the Engenia label which totals 222 products. One new product was added to the pH Modifier group of the Engenia label which totals 17 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.

Upcoming Meetings

1. **Solar Leasing Workshop**. The meeting is on February26, 2020 from 8:30 AM to 11:00 AM at Champaign County Community Center (1521 South US Rt. 68, Suite B100, Urbana, OH). The meeting costs $5.00 and registration is due by February 21st by calling 937-484-1526 or e-mailing Douridas.9@osu.edu. There is a breakfast at 8:00 AM

2. **Conservation Tillage Conference.** The annual Conservation Tillage Conference (CTC) will take place this year on March 3 and 4, 2020 at Ohio Northern University in Ada, OH. About 75 speakers will be present. Early registration ends February 21, 2020. The cost for the two-day event with early registration is $95.00. To register and learn more details about the program visit ctc.osu.edu.

3. **New Fertilizer Applicator Training.** There are two sessions to this meeting, one from 1:00 to 4:00 PM and the other from 6:00 to 9:00 PM. The meeting date in March 11, 2020 and the location is the new Tri-

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Star Career Compact. Contact Mercer County Extension Office at 419-767-6037. If you know of someone that still does not have this certification, get them to come to this meeting.

4. **eFields Regional Meeting.** eFields is an Ohio State University program dedicated to advancing production agriculture through the use of field-scale research. This meeting will take place on March 16, 2020 from 9:00 AM to 12:00 PM at the Adult Applied Technology Center, 8901 Looney Road, Piqua, OH. No cost for the program. Register for meeting by March 10, 2020 by going to go.osu.edu/eFieldsMeeting. This meeting is to share 2019 research results from West Central Ohio and to discuss future research projects. This is an important meeting to attend to find out the latest information.

5. **New Pesticide Applicator Exam Preparation Course.** This meeting will be held March 23, 2020 from 8:30 AM to 12:30 PM in the downstairs room of Auglaize County Administration Building. Please pre-register before March 20, 2020 by calling the office at 419-739-6580 or e-mailing Stachler.1@osu.edu. There is no cost to the program.

6. **Pesticide Applicator Exam.** The ODA will be in the county on March 30, 2020 from 10:00 AM to 2:00 PM to offer pesticide and fertilizer applicator exams. The location is the downstairs room of the Auglaize County Administration Building. To register for the exam visit http://pested.osu.edu/PrivateApplicator/testing.

7. **Last Chance Pesticide and Fertilizer Applicator Recertification.** This meeting will be held March 31, 2020 for those individuals that still have not received their recertification courses. The meeting time is from 8:30 AM to 1:30 PM in the downstairs room of the Auglaize County Administration Building. Register for the class before March 30th by calling the office at 419-739-6580 or e-mailing Stachler.1@osu.edu. There is a $10.00 fee for fertilizer only, $30.00 fee for pesticide credits only and $40.00 for both. Categories 1, 2,3 ,4 ,5 6, and 15 will be offered that day.

Answer to joke: Comedihens!

Corn and Soybean Production Numbers Released

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Last week the United States Department of Agriculture National Agricultural Statistics Service released 2019 corn and soybean production information.

In the United States 89,700,000 acres of corn was planted in 2019. Farmers harvested 81,482,000 acres for grain in 2019. Average corn yield in the United State was 168 bushels per acre.

In the state of Ohio 2.8 million acres of corn was planted. This was only 3.1% of the national corn acreage. In 2018, Ohioans planted 3.5 million acres of corn. About 2.57 million acres of corn was harvested for grain in 2019. The average yield in Ohio in 2019 was 164.0 bushels per acre, 4 bushels lower than the country average. The average yield in 2018 in Ohio was a record 187.0 bushels per acre. In 2017 corn grain yield was 177 bushels per acre. Total corn produced in 2019 in the state was 421,480,000 bushels, 3.1% of the United States total corn production. The county with the highest corn yield was Clinton County at 185.5 bushels per acre.

A total of 51,000 acres of corn was planted in Auglaize county in 2019 compared to 70,000 in 2018 and 71,000 in 2017. This is the lowest number of acres planted since 1996 when only 50,000 acres were planted and tied for the third least acres since 1972! The fewest acres of corn planted since 1972 was 49,800 in 1987. Auglaize County farmers harvested 46,000 acres in 2019. The average corn yield in 2019 in Auglaize County was only 160.9, 3.1 bushels lower than the state average and ranked 33rd in the state. This was the lowest yield since 2016 when it was 134.3 bushels per acre. I still do not think this is the correct yield for the county. A 2019 OSU production survey said average corn yield in Auglaize County was 187.8 bushels per acre which is closer, but still a little high. Corn yielded 210 bushels per acre in 2018, which was third in the state. Corn yielded 172.9 bushels per acre in 2017. Total corn produced in Auglaize County in 2019 was 7.4 million bushels, 1.8% of Ohio's total corn crop.

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A special honor was received the other week by an Auglaize County farmer. Jerry Shipp was awarded the highest corn yield for the northwest area of Ohio with the National Corn Growers Competition with a yield of 265.51 bushels per acre.

Soybean were planted on 76,100,000 acres in the United States in 2019 and harvested 75,021,000 acres. This was a decrease of 13,067,000 acres compared to 2018. The national soybean yield for 2019 was 47.4 bushels per acre. Total soybean production in the United States in 2019 was 3,558,281,000 bushels.

Ohio farmers planted 4.3 million acres of soybean in 2019 and harvested 4.27 million acres. Ohio's planted acreage was 5.7% of the United State total planted acreage. The average soybean yield in Ohio in 2019 was 49 bushels per acre, 1.6 bushels per acre more than the national average and seven bushels per acre less than last year's 56 bushels per acre. Total Ohio production for 2019 was 209,230, 000 bushels which is only 5.9% of the United States production.

Auglaize County farmers planted 97,500 acres in 2019, but harvested only 97,000 acres, compared to 101,500 planted in 2018. This was the third most acres of soybean planted in Auglaize County with the 2018 acreage as the most. The acreage planted in Auglaize County in 2019 was 2.3% of the states acreage. Soybean yield in Auglaize County in 2019 was 48.8 bushels per acre, just 0.2 bushels per acre less that the state average, but 15.2 bushels per acre less than 2018 which was a record for Auglaize County. The Auglaize Count yield was ranked 33rd in the state. A far cry from the second place we had last year! Total soybean production in Auglaize County in 2019 was 4.729 million bushels.

C.O.R.N. Newsletter

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

No information this week.

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Other Articles

New artificial intelligence algorithm better predicts corn yield

Date: February 20, 2020
Source: University of Illinois College of Agricultural, Consumer and Environmental Sciences
Source: https://www.sciencedaily.com/releases/2020/02/200220130500.htm

With some reports predicting the precision agriculture market will reach $12.9 billion by 2027, there is an increasing need to develop sophisticated data-analysis solutions that can guide management decisions in real time. A new study from an interdisciplinary research group at University of Illinois offers a promising approach to efficiently and accurately process precision ag data.

"We're trying to change how people run agronomic research. Instead of establishing a small field plot, running statistics, and publishing the means, what we're trying to do involves the farmer far more directly. We are running experiments with farmers' machinery in their own fields. We can detect site-specific responses to different inputs. And we can see whether there's a response in different parts of the field," says Nicolas Martin, assistant professor in the Department of Crop Sciences at Illinois and co-author of the study.

He adds, "We developed methodology using deep learning to generate yield predictions. It incorporates information from different topographic variables, soil electroconductivity, as well as nitrogen and seed rate treatments we applied throughout nine Midwestern corn fields."

Martin and his team worked with 2017 and 2018 data from the Data Intensive Farm Management project, in which seeds and nitrogen fertilizer were applied at varying rates across 226 fields in the Midwest, Brazil, Argentina, and South Africa. On-ground measurements were paired with high-resolution satellite images from PlanetLab to predict yield.

Fields were digitally broken down into 5-meter (approximately 16-foot) squares. Data on soil, elevation, nitrogen application rate, and seed rate were fed into the computer for each square, with the goal of learning how the factors interact to predict yield in that square.

The researchers approached their analysis with a type of machine learning or artificial intelligence known as a convolutional neural network (CNN). Some types of machine learning start with patterns and ask the computer to fit new bits of data into those existing patterns. Convolutional neural networks are blind to existing patterns. Instead, they take bits of data and learn the patterns that organize them, similar to the way humans organize new information through neural networks in the brain. The CNN process, which predicted yield with high accuracy, was also compared to other machine learning algorithms and traditional statistical techniques.

"We don't really know what is causing differences in yield responses to inputs across a field. Sometimes people have an idea that a certain spot should respond really strongly to nitrogen and it doesn't, or vice versa. The CNN

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can pick up on hidden patterns that may be causing a response," Martin says. "And when we compared several methods, we found out that the CNN was working very well to explain yield variation."

Using artificial intelligence to untangle data from precision agriculture is still relatively new, but Martin says his experiment merely grazes the tip of the iceberg in terms of CNN's potential applications. "Eventually, we could use it to come up with optimum recommendations for a given combination of inputs and site constraints."

Genetics of how corn can adapt faster to new climates

Date: February 21, 2020
Source: University of Delaware
Source: https://www.sciencedaily.com/releases/2020/02/200221160739.htm

Maize is a staple food all over the world. In the United States, where it's better known as corn, nearly 90 million acres were planted in 2018, earning $47.2 billion in crop cash receipts.

But, under the effects of climate change, this signature crop may not fare so well. As the world tries to feed a population skyrocketing to nine billion by 2050, that has major implications. So, what can we do about it? The answer might be exotic.

A multi-institutional team led by University of Delaware plant geneticist Randy Wisser decoded the genetic map for how maize from tropical environments can be adapted to the temperate U.S. summer growing season. Wisser sees these exotic varieties, which are rarely used in breeding, as key to creating next-era varieties of corn.

The research team included scientists from UD, North Carolina State University, University of Wisconsin, University of Missouri, Iowa State University, Texas A&M University and the U.S. Department of Agriculture-Agricultural Research Service. The resulting study, highlighted by the editorial board of *Genetics*, provides a new lens into the future viability of one of the world's most important grains.

"If we can expand the genetic base by using exotic varieties, perhaps we can counter stresses such as emerging diseases and drought associated with growing corn in a changing climate," said Wisser, associate professor in UD's Department of Plant and Soil Sciences. "That is critical to ensuring ample production for the billions of people who depend on it for food and other products."

Modern maize strains were created from only a small fraction of the global maize population. This limited infusion of diversity raises concerns about the vulnerability of American corn in a shifting climate. The U.S. Department of Agriculture (USDA) seed bank includes tens of thousands of varieties, but many are just not being used.

"We know that the tropical maize varieties represent our greatest reservoir of genetic diversity," said study co-author Jim Holland, a plant geneticist with the USDA Agricultural Research Service at North Carolina State. "This

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study improved our understanding of those genetics, so we can use this information to guide future breeding efforts to safeguard the corn crop."

Certain exotic strains of maize better handle drought or waterlogging or low-nitrogen soil, for example. But because these strains have evolved outside the U.S., they are not immediately suited to states like Delaware. So, exotics first need to be pre-adapted.

In prior work, Wisser and his colleagues showed how 10 years of repeated genetic selection was required to adapt a tropical strain of maize to the temperate U.S. Co-author Arnel Hallauer spent a decade adapting the population through selective breeding, so it could flourish in an environment like Delaware.

"What's so cool now is that we could go back to the original generations from Dr. Hallauer and grow them side by side in the same field," Wisser said of the first-of-its-kind experimental design. "This allows us to rule out the influence of the environment on each trait, directly exposing the genetic component of evolution. This has opened a 'back to the future' channel where we can redesign our approach to developing modern varieties."

While extremely impressive, a decade to adapt exotic maize to new environments is a lot of time when the climate change clock is ticking.

"Unfortunately, this process takes 10 years, which is not counting ongoing evaluations and integrating the exotic variations into more commonly used types of maize," Wisser said. "With the climate threats we face, that's a long time. So, gaining insights into this evolutionary process will help us devise ways to shorten the time span."

Accelerating adaptation

Wisser isn't wasting any time as he explores ways to bolster corn's ability to survive and thrive. He and Holland are working on a new project to cut that time span in half.

In cutting-edge research funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture, the team is analyzing how corn genomes behave in a target environment as they aim to formulate a predictive model for fitness.

"What we're doing is sequencing the genomes and measuring traits like flowering time or disease for individuals in one generation. From this, we can generate a lookup table that allows us to foresee which individuals in the next generation have the best traits based on their genetic profiles alone," Wisser said. "And our lookup table can be tailored to predict how the individuals will behave in a particular environment or location like Delaware."

That means plant breeders could grow a second generation of corn anywhere outside of Delaware, but still predict which individuals would be the most fit for Delaware's environment.

"For instance, even if the plants are grown at a location where a disease is not present, our prediction model can still select the resistant plants and cross them to enrich the genes that underlie resistance," Wisser said.

With this approach, researchers don't have to wait out a Delaware winter, so they can continue to pre-adapt the population for at least one extra generation per year. That's how 10 years of selective breeding for pre-adaptation could become five, providing a quicker route to access exotic genes.

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This new effort connects to the Genomes To Fields (G2F) Initiative, developed in 2013 for understanding and capitalizing on the link between genomes and crop performance for the benefit of growers, consumers and society.

If Wisser and Holland can develop a method to rapidly pre-adapt exotics, this opens a lane for G2F to test the impact of these unique genomes on crop performance.

"Our goal is to advance the science so breeders can draw on a wider array of the diversity that has accumulated across thousands of years of evolution," explained Wisser, who has been involved in the public-private initiative since its beginning. "In turn, they can produce improved varieties for producers and consumers facing the challenges of climate change."

Ohio tackles “TMDL” for Lake Erie’s Western Basin

By:Ellen Essman, , Senior Research Associate , Senior Research Associate Wednesday, February 19th, 2020
Source: https://farmoffice.osu.edu/blog/wed-02192020-409pm/ohio-tackles-%E2%80%9Ctmdl%E2%80%9D-lake-erie%E2%80%99s-western-basin

For the last several years, the state of Ohio and the U.S. EPA have been plagued with objections and lawsuits—from states, local governments, and environmental groups—concerning Ohio’s list of impaired waters and development of total maximum daily loads (TMDLs) for the Western Basin of Lake Erie. (Some of our past blog posts on the subject are available here, here, and here.) Under the Clean Water Act (CWA), states are required to submit a list of impaired, or polluted, waters every two years. Typically, designating a water body as impaired triggers a review of pollution sources, determinations of TMDLs for different pollutants, and an action plan for meeting those TMDLs. Ohio repeatedly failed to include the Western Basin in its list of impaired waters, even though the area has been subject to pollution-caused algal blooms in recent years. When the state finally listed the Western Basin waters as impaired in 2018, it still did not develop the accompanying TMDL for the area. However, Ohio’s TMDL drought ended last week.

Ohio EPA announced on February 13, 2020, that it would develop TMDLs for the Western Basin “over the next two to three years.” This decision will ultimately affect farmers in the watershed, as it is likely that the Ohio EPA would create TMDLs for phosphorus, nitrogen, and other fertilizers in the Western Basin. Consequently, farmers may have to reduce the amounts they put on their fields, and/or implement additional measures to keep such inputs from running off into the water.

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So, Ohio listed the Western Basin as impaired and is working on TMDLs for the area—the controversy is over, right? Not so fast. Lucas County, Ohio and the Environmental Law & Policy Center filed a lawsuit against the U.S. EPA that is still ongoing. (We last discussed this lawsuit here.) Basically, the plaintiffs in the suit are arguing that the U.S. EPA violated the CWA when it allowed the Ohio EPA to designate the Western Basin as impaired in 2018, but did not make the state develop TMDLs. Even though Ohio has since promised to implement TMDLs for the area, the outcome of the case will still weigh in on the crucial question of whether the U.S. EPA can *make* states create TMDLs for impaired waters under the CWA. In addition, the U.S. District Court case applies to Ohio's 2018 impaired waters list, whereas Ohio EPA's recent announcement concerns the 2020 list. Finally, it's doubtful that environmental groups and others will stop their efforts just because Ohio has now promised to create TMDLs—it's almost a certainty that the debate over pollution in the Western Basin and the best ways to remedy the problem will persist.

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