Hello Northeast Ohio Counties!

Welcome to October! The air is crisp, the leaves are changing color, and harvest is underway here in NE Ohio. Whether you are operating equipment or driving down the road this fall, be safe by sharing the road and being aware of your surroundings.

The weather forecast for this year’s harvest looks promising with warmer and drier than average being the prediction. You can read more about in today’s first article.

We also have results from the NE Ohio soybean weed surveys conducted last month!

Have a great and safe week!

Lee Beers  
Trumbull County Extension Educator

Andrew Holden  
Ashtabula County Extension Educator

Angie Arnold  
Portage County Extension Educator
Harvest to Spring Weather Outlook

By: Jim Noel
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2020-34/harvest-spring-weather-outlook

Areas of frost have occurred in parts of Ohio in late September to early October but the pattern is about to switch again toward a warmer and drier pattern for a decent part of October.

October Outlook

Expect a return to warmer and drier weather for a good part of this month. Temperatures will range from normal to 10 above normal this month but will average 2-5 degrees above normal. We have not had a widespread freeze yet but typically it ranges from Oct. 10-20 for much of the state and it looks like it will be in the later range of normal this year as we discussed a while ago. Rainfall the next two weeks can be seen in the attached image. Most of the wet weather will stay south of Ohio though far southern and eastern Ohio could get clipped by some tropical moisture return to yield near normal rainfall in those areas. Otherwise, rainfall should be below normal.

Winter Outlook

A pattern change will occur this winter. It appears it will start warmer than normal and then turn colder than normal. Precipitation will also become above wetter than normal.

Spring 2021 Outlook

It looks like a potential cool and damp spring next year if the La Nina lingers than long. For more information: https://www.cpc.ncep.noaa.gov/

Local NE Ohio Results from This Year’s Soybean Weed Survey

By: Andrew Holden

This year OSU Extension Educators from Ashtabula, Geauga, Trumbull, and Portage participated in a state-wide Fall Soybean Weed Survey and the results are in. The survey consist of driving approximately 100 miles around each county and observing
random soybean fields at one mile increments along the path. The fields are observed to determine which weeds are present, if any, and the level of infestation. After compiling the data from thousands of acres of surveyed fields, here are the main take ways for the 2020 growing season.

First, marestail still reigns supreme, it was the number 1 observed weed in all 4 counties with 34% of Ashtabula fields, 32% of Trumbull fields, and 22% of Geauga fields. Portage also saw marestail as its number one weed in soybeans. While marestail is being better controlled every year, it still has a strong hold as the number one.

When it comes to the next populist weed there begins to be some discrepancy among the counties. Common ragweed and lambsquarter were found at a high rate in Geauga and Portage, while Trumbull had grasses and Ashtabula had pigweeds coming in at number 2. Redroot pigweed is not a major issue currently, but the close relative of palmer amaranth and waterhemp are. By allowing redroot pigweed to escape control we are at risk of allowing its dangerous and herbicide resistant relative to invade our fields. Volunteer corn also made an appearance in the county’s top weeds (Geauga 5%, Trumbull 14%, Ashtabula 24%). Volunteer corn can cause yield loss if the infestation is large enough so don’t let it go unchecked.

Finally, NE Ohio had decent levels of weed-free fields. Around 1/3 of fields were weed free in Ashtabula (32%) and Trumbull (37%) and almost 60% were weed free in Geauga County (59%).

We here at OSU Extension hope to see the number of weed free fields increase next year and are here to assist you in your weed control efforts. Make note of what weeds you are seeing this year because chances are you will be dealing with them again next year. To get information on weed control or weed identification, call your local Extension Office. We also have hard copy resources like the OSU 2020 Weed Control Guides available for purchase at our office, just call ahead! If you are in Ashtabula county and want to hear more about the 2020 weeds survey watch my video on it at https://go.osu.edu/ashtabulavideos. Thank you Lee Beers in Trumbull County, Les Ober in Trumbull County, and Angie Arnold in Portage County for this years weed survey information.

**Gibberella Ear Rots Showing up in Corn: How to Tell It Apart from Other Ear Rots**

By: Pierce Paul and Felipe Dalla Lana da Silva

Source: [https://agcrops.osu.edu/newsletter/corn-newsletter/2020-34/gibberella-ear-rots-showing-corn-how-tell-it-apart-other-ear-rots](https://agcrops.osu.edu/newsletter/corn-newsletter/2020-34/gibberella-ear-rots-showing-corn-how-tell-it-apart-other-ear-rots)
Over the last two weeks, we have received samples or pictures of at least two different types of corn ear rots – Gibberella and Trichoderma. Of the two, Gibberella ear rot (GER) seems to be the most prevalent. Ear rots differ from each other in terms of the damage they cause (their symptoms), the toxins they produce, and the specific conditions under which they develop. GER leads to grain contamination with mycotoxins, including deoxynivalenol (also known as vomitoxin), and is favored by warm, wet, or humid conditions between silk emergence (R1) and early grain development. However, it should be noted that even when conditions are not ideal for GER development, vomitoxin may still accumulate in infected ears.

A good first step for determining whether you have an ear rot problem is to walk fields between dough and black-layer, before plants start drying down, and observe the ears. The husks of affected ears usually appear partially or completely dead (dry and bleached), often with tinges of the color of the mycelium, spores, or spore-bearing structures of fungus causing the disease. Depending on the severity of the disease, the leaf attached to the base of the diseased ear (the ear leaf) may also die and droop, causing affected plants to stick out between healthy plants with normal, green ear leaves. Peel back the husk and examine suspect ears for typical ear rot symptoms. You can count the number of moldy ears out of every 50 ears examined, at multiple locations across the field to determine the severity of the problem.

Diplodia (A), Gibberella (B), Fusarium (C) and Trichoderma ear rots of corn

Ear rot symptoms
**GIBBERELLA EAR ROT** - When natural early-season infections occur via the silk, Gibberella ear rot typically develops as white to pink mold covering the tip to the upper half of the ear. However, infections may also occur at the base of the ear, causing the whitish-pink diseased kernels to develop from the base of the ear upwards. This is particularly true if ears dry down in an upright position and it rains during the weeks leading up to harvest. The Gibberella ear rot fungus may also infect via wounds made by birds or insects, which leads to the mold developing wherever the damage occurs. When severe, Gibberella ear rot is a major concern because the fungus produces several mycotoxins, including vomitoxin, that are harmful to livestock. Once the ear is infected by the fungus, these mycotoxins may be present even if no visual symptoms of the disease are detected. Hogs are particularly sensitive to vomitoxin. Therefore, the FDA advisory level for vomitoxin in corn to be fed to hogs is 5 ppm and this is not to exceed 20% of the diet.

**TRICHODERMA EAR ROT** – Abundant, thick, greenish mold growing on and between the kernels make Trichoderma ear rot very easy to distinguish from Diplodia, Fusarium, and Gibberella ear rots. However, other greenish ear rots such as Cladosporium, Penicillium and Aspergillus may sometimes be mistaken for Trichoderma ear rot. Like several of the other ear rots, diseased ears are commonly associated with bird, insect, or other types of damage. Another very characteristic feature of Trichoderma ear rots is sprouting (premature germination of the grain on the ear in the field). Although some species of Trichoderma may produce mycotoxins, these toxins are usually not found in Trichoderma-affected ears under our growing conditions.

**DIPLODIA EAR ROT:** This is one of the most common ear diseases of corn in Ohio. The most characteristic symptom and the easiest way to tell Diplodia ear rot apart from other ear diseases such as Gibberella and Fusarium ear rots is the presence of white mycelium of the fungus growing over and between kernels, usually starting from the base of the ear. Under highly favorable weather conditions, entire ears may become colonized, turn grayish-brown in color and lightweight (mummified), with kernels, cobs, and ear leaves that are rotted and soft. Rotted kernels may germinate prematurely, particularly if the ears remain upright after physiological maturity. Corn is most susceptible to infection at and up to three weeks after R1. Wet conditions and moderate temperatures during this period favor infection and disease development, and the disease tends to be most severe in no-till or reduce-till fields of corn planted after corn. The greatest impact of this disease is grain yield and quality reduction. Mycotoxins have not been associated with this disease in US, although animals often refuse to consume moldy grain.

**FUSARIUM EAR ROT:** Fusarium ear rot is especially common in fields with bird or insect damage to the ears. Affected ears usually have individual diseased kernels scattered over the ear or in small clusters (associated with insect damage) among healthy-looking kernels. The fungus appears as a whitish mold and infected kernels
sometimes develop a brownish discoloration with light-colored streaks (called starburst). Several different Fusarium species are associated with Fusarium ear rot, some of which produce toxins called Fumonisins. Horses are particularly sensitive to Fumonisins, but cattle and sheep are relatively insensitive.

**STORAGE:** Where possible, harvest affected fields early separately from other fields. Storage is key as poor storage may cause toxin levels to increase. Warm, moist pockets in the grain promote mold development, causing the grain quality to deteriorate and toxin levels to increase. Aeration is important to keep the grain dry and cool. However, it should be noted that while cool temperatures, air circulation, and low moisture levels will minimize fungal growth and toxin production, these will not decrease the level of toxin that was already present in grain going into storage.

- Dry and store harvested grain to below 15% moisture to minimize further mold development and toxin contamination in storage.
- Store dried grain at cool temperatures (36 to 44°F) in clean, dry bins. Moderate to high temperatures are favorable for fungal growth and toxin production.
- Periodically check grain for mold, insects, and temperature.
- If mold is found, send a grain sample for mold identification and analysis to determine if toxins are present and at what level.
- Clean bins and storage units between grain lots to reduce cross-contamination.

*The information summarized in this section was taken from factsheet # PLPATH-CER-04 ([http://ohioline.osu.edu/factsheet/plpath-ker-04](http://ohioline.osu.edu/factsheet/plpath-ker-04)).*

## 2009 – 2019: A Period of Poor Net Returns for Crop Producers

By: Chris Zoller  

According to data compiled by the USDA Economic Research Service (ERS), the period from 2009 – 2019 provided variable net returns to U.S. producers of corn, soybeans, and wheat. The ability to cover total costs of production has been most significant since 2012, the last year all three commodities provided positive returns (see Figure 1).

Total costs include operating costs, such as fertilizer, seed, and chemicals, and overhead costs, including unpaid labor, depreciation, land costs, and other opportunity costs. While crop sales generally cover the annual operating costs, net returns have often been negative. Net returns are calculated by subtracting total costs from total
receipts. Because of this, overhead costs are often not covered from resulting crop sales.

According to an analysis by USDA ERS, net returns for corn increased early in the period because of an increase in the production of corn-based ethanol. Corn acreage and yields remained high after the expansion leading to oversupply and lower returns. Until 2018, net returns for soybeans exceeded those of corn. Because of international competition and high yields, wheat prices and returns declined over the decade.

Figure 1. Estimated annual returns for corn, soybeans, and wheat, 2009-2019

Looking Ahead

Harvest of this year’s corn and soybean crop has begun, and thoughts will soon turn to planning for 2021. Producers are encouraged to use crop budgets prepared by Ohio State University Extension, available at: https://farmoffice.osu.edu/farm-mgt-tools/farm-budgets. These Excel-based budgets provide a listing of variable and fixes costs for various yield scenarios, along with a column for producers to insert their predicted yields.

In addition to the OSU Extension budgets, you may be interested in completing a complete farm financial analysis at the beginning of 2021. See the OSU Extension Farm Business Analysis and Benchmarking Program (https://farmprofitability.osu.edu/) for additional information.
There are many uncertainties, including weather, market demand, costs, prices, and government payments. Large government payments have been made recently, but there is no guarantee as to whether additional payments will be made in 2021. Talk to your lender, accountant, and Extension Educator as you prepare for the 2021 growing season.

**Ohio Farm Custom Rates 2020**

By: Barry Ward, John Barker, Eric Richer, CCA

Farming is a complex business and many Ohio farmers utilize outside assistance for specific farm-related work. This option is appealing for tasks requiring specialized equipment or technical expertise. Often, having someone else with specialized tools perform a task is more cost effective and saves time. Farm work completed by others is often referred to as “custom farm work” or more simply, “custom work”. A “custom rate” is the amount agreed upon by both parties to be paid by the custom work customer to the custom work provider.

Ohio Farm Custom Rates 2020 reports custom rates based on a statewide survey of 377 farmers, custom operators, farm managers, and landowners conducted in 2020. These rates, except where noted, include the implement and tractor if required, all variable machinery costs such as fuel, oil, lube, twine, etc., and the labor for the operation.

Some custom rates published in this study vary widely, possibly influenced by:
- Type or size of equipment used (e.g. 20-shank chisel plow versus a 9-shank)
- Size and shape of fields,
- Condition of the crop (for harvesting operations)
- Skill level of labor
- Amount of labor needed in relation to the equipment capabilities
- Cost margin differences for full-time custom operators compared to farmers supplementing current income

Some custom rates reflect discounted rates as the parties involved have family relationships or are strengthening a relationship to help secure the custom farmed land in a cash or other rental agreement. Some providers charge differently because they are simply attempting to spread their fixed costs over more acreage to decrease fixed costs per acre and are willing to forgo complete cost recovery.

The complete “Ohio Farm Custom Rates 2020” is available online at the Farm Office website [here](https://agcrops.osu.edu/newsletter/corn-newsletter/2020-34/ohio-farm-custom-rates-2020).

Northeast Ohio Agriculture

Ohio State University Extension
Ashtabula, Portage and Trumbull Counties
First Look at a Sustainable Agricultural Mulch
By: Adityarup “Rup” Chakravorty

Farmers often need to regulate soil temperature, reduce weeds, and minimize water loss. Agricultural mulch can help farmers do so.

But the plastic in commonly used agricultural mulch can degrade soil and water quality. Microplastics can even enter the food chain.

In a new study, researchers tested a more sustainable approach to lowering evaporation from soils. Instead of plastic, they used sand particles coated with soybean oil. This research was published in the Vadose Zone Journal, a publication of the Soil Science Society of America.

In laboratory experiments, soil treated with a thin layer of soybean oil-coated sand had up to 96% lower evaporative water loss compared to bare soil.

“These findings show that oil-coated sand has the potential to be developed into a sustainable alternative to plastic film mulch”, says Michael Nicholl. Nicholl is an associate professor at the University of Nevada in Las Vegas.


Biobased soil coatings – such as soybean oil – could be low-impact alternatives to polyethylene mulch while performing at similar levels.

To make the coated sand, researchers mixed roughly equal volumes of sand and oil. Then they heated the mixture for about an hour and allowed it to cool. Finally, the mixture was washed with water and dried.

This process chemically modifies the oil, partially polymerizing it. The partially polymerized oil forms a coating around individual sand particles.
Initial tests indicated that this oil-coated sand is quite effective at reducing water loss through evaporation.

Water evaporates from soils in two different ways. The oil-coated sand reduced the more potent path of evaporative water loss.

“As an analogy, think of soil as a damp sponge,” says Nicholl.

If you set the sponge in a puddle of water, the water will soak up into the sponge. Eventually, the water will rise to the top of the sponge. Then it will evaporate into the air.

Similarly, wicking action carries water to the soil surface. There, it evaporates directly into the air.

In the second mechanism, the water is unable to wick all the way to the soil surface. Instead, it evaporates into the air within the soil. This humid air must diffuse upwards through the soil and ultimately escape into the atmosphere.

“This second mechanism is much less efficient than the first,” says Nicholl. “It results in lower rates of evaporation.”

Nicholl and his team wanted to test if a surface layer of oil-coated sand would reduce either way of evaporation from underlying soils.

He and his research colleague filled PVC columns with test soils. Then, they layered oil-coated sand on top of the columns but left one column bare. Finally, they saturated these columns with water.

Each column was then tested for evaporative water loss.

The oil-coated sand reduced the amount of water wicking upwards, thus minimizing the first evaporation mechanism.
Researchers weren’t sure if it would be possible to coat single sand particles with oil. There was a danger the sand and oil would be cemented together.

“We found instead that individual sand grains can be coated with partially-polymerized oil,” says Nicholl.

That’s important because any soil treatment aimed at reducing water loss also has to allow water – via rainfall or irrigation – to enter the soil. A sheet of oil-coated sand fused together could stop water from entering the soil.

Laboratory tests showed that liquid water could pass through the layer of oil-coated sand. That suggests this material will not hinder irrigation efforts.

“Though initial results are encouraging, there are many questions still to answer,” says Nicholl.

For example, this bio-based mulch has not been exposed to outdoor environments. “So, we don’t have adequate data to determine how this material weathers in an agricultural setting,” says Nicholl.

Researchers are exploring procedures to measure the longevity of coated materials in various settings. These include arid environments, temperate environments, and biologically active soils.

“We hope this work inspires further inquiry into the practical applications of oil-coated materials,” says Nicholl.

The newest edition of the Ashtabula County Plat Book is available

The newest edition of the Ashtabula County Plat Book is available for purchase for $25 + tax at Ashtabula County - OSU Extension Office located at 39 Wall Street in Jefferson. Premium wall maps are also available. For more information contact the office at (440) 576-9008. Traditional landownership maps by township and range, a landowner index for easy cross referencing, and other county information are all available in the new plat book. Visit mappingsolutionsGIS.com for digital versions of Ashtabula County landowner maps. Mapping Solutions is the publisher. Perfect for hunting season!