Hello Northeast Ohio Counties!

I really want a break from the weeds. We’ve identified another location this week with Palmer amaranth. It was a single plant beneath a bird feeder so it was likely in the bird food, or the bird deposited it there after eating it locally. Either way we need to stay vigilant with this weed. If you think you have it, I am happy to come take a look – just give us a call.

The articles this week are a little longer than normal, but they are full of great information. There has been a lot of information coming out from western states about hemp, so the hemp article is actually very interesting.

Stay safe!

Lee Beers
Trumbull County Extension Educator

Andrew Holden
Ashtabula County Extension Educator
October 2019 - Weather Prediction
By Jim Noel

After another hot week (until late this week), a cool down to normal temperatures is expected starting either Oct. 3 or 4 that will last through Oct. 15. Temperatures are expected to return to above normal (but no where near current levels) from Oct. 15-31.

Rainfall will be above normal in northern Ohio this week. The week of Oct. 7 will be normal or below normal but confidence is next week’s rainfall pattern is low to moderate. Above normal rainfall is in the outlook for the second half of October which could slow harvest after Oct. 15.

The hot and drier pattern for a good part of September was caused in part by tropical activity. The remnants of Dorian created a big low pressure system not far from Greenland while a typhoon called Lingling in the western Pacific created a big low pressure near Alaska. This resulted in a hot and dry dome of high pressure over the Southeast U.S. and wet weather in the western corn and soybean belt. This pattern appears ready to breakdown later this week.

We are moving into frost and freeze season and overall it still looks like a delayed frost and freeze season. Most see their first freeze by Oct. 10-20. Currently, it still looks like a normal to later than normal first freeze.

The November outlook still indicates a warmer than normal month with precipitation not far from normal (but with a lot of uncertainty). We will keep you posted on this. Finally, the two week rainfall outlook from OHRFC can be found here: https://www.weather.gov/images/ohrfc/dynamic/NAEFS16_aapc_mean_total.png. It shows the wettest areas being the western two-thirds of the corn and soybean belt. Rainfall for the next two weeks in Ohio will be 1-2+ inches in northern Ohio but...
generally 0.10-0.50 inches in southern Ohio. Normal is about 1.5 inches for two weeks.

**Fall Herbicide Treatments – Even More Important This Year?**

By Mark Loux

Source: [https://agcrops.osu.edu/newsletter/corn-newsletter/2019-33/fall-herbicide-treatments-–-even-more-important-year](https://agcrops.osu.edu/newsletter/corn-newsletter/2019-33/fall-herbicide-treatments-–-even-more-important-year)

If you have never applied herbicide in fall to burn down winter annuals, or done it only infrequently, this might be the year to make an investment in fall herbicides. Fall treatments are an integral component of marestail management programs. They also prevent problems with dense mats of winter annuals in the spring, which can prevent soil from drying out and warming up, interfere with tillage and planting, and harbor insects and soybean cyst nematode. 2019 was a generally tough year for weed control, leading to higher end of season weed populations in some fields. A number of acres were never planted, and growers got to experience the difficulty in obtaining season-long control in the absence of a crop. Reminds us all how important the crop canopy and shading of the soil is during the second half of the season. Bottom line - there was substantial production of weed seed in some fields, and a replenishment of the soil seedbank by both winter annual and summer annual weeds. The seed of winter annuals and marestail lacks dormancy so above-average weed seed production can lead to an immediate increase in fall-emerging weeds. Applying herbicides this fall can compensate for increased weed populations and make life easier in the spring.

We have published information on fall herbicides fairly frequently, and our suggestions for fall treatments have not really changed much. There is plenty of information on fall herbicide treatments in the C.O.R.N. newsletter archive and on
other university websites. Our philosophy on this has not changed much over the past decade. A few brief reminders follow:

1. When to spray? Anytime between now and Thanksgiving will work, and possibly later. We have applied into late December and still eventually controlled the weeds present at time of application. Once hard freezes start to occur, there is usually a substantial change in the condition of certain weeds, such as dandelion and thistle, that renders them less sensitive to herbicides. We discourage applications during periods of very cold weather which can occur starting about Thanksgiving, and also (obviously) when the ground is snow-covered. The generally dry conditions we are experiencing have limited weed emergence so far this fall. We anticipate that rain occurring now that leads to some sustained soil moisture near the surface will likely result in germination and emergence of the weeds that have been missing until now. Our recommendation is to wait for rain and the additional weed emergence before applying any herbicide this fall. The risk in this is that the weather turns wet, making it difficult to apply herbicide. So it’s also possible to apply now and include a residual component to help with later fall emergence (which is the exception to the “no residual” recommendation in #4 below), such as simazine, a low rate of metribuzin or Canopy, or a Sharpen rate higher than 1 oz.

2. What about all of the crop residue on the ground after harvest - won’t that cause problems? We have not worried about this, and the herbicides seem to work regardless. Most agronomists I have asked have the same impression. On the other hand, it probably wouldn’t hurt to wait a while after harvest to let the residue settle down, and the weeds to poke through. Dense crop residue usually prevents marestail from emerging anyway.

3. Don’t make it too complicated or pricey. Keep in mind that the primary goal is control of weeds that have already emerged. This is hard to accomplish with a single herbicide, but there are a number of relatively low-cost two-way mixtures that easily achieve this goal. Our philosophy has generally been to start with 2,4-D, and then add another herbicide that results in more comprehensive control. Herbicides that make the most sense to add to 2,4-D based on our research: glyphosate, dicamba, metribuzin, simazine, Basis (and generic equivalents), Express (and generic equivalents), or Canopy/Cloak DF or EX. These allow either corn or soybeans to be planted the following year with these exceptions: simazine - corn next year; Canopy/Cloak - soybeans next year; Basis - possibly restricted to corn based on rate and geography. We do not see the need for three-way mixtures, although a case can be made to add a low rate of glyphosate to a two-way mix to control grass or improve activity on perennials. A two-way mixture of glyphosate and Sharpen could also be used, but we believe Sharpen has more utility in marestail control programs when used in the spring.
4. Is there an advantage to including residual herbicides? No, because almost all of them dissipate over the winter and fail to provide any control of spring-emerging weeds. The primary exception to this is chlorimuron (Canopy/Cloak), which for whatever reason does persist at high enough concentrations to provide some control in spring. Our research has repeatedly shown that applying other residual herbicides in the fall to get control in spring is a waste of money. The good news here is that any effective fall herbicide treatment with or without residual will result in a weed-free seedbed in spring, usually into April, so that the spring-applied burndown/residual treatment just has to control small weeds that emerge in the few weeks prior to planting. That is the goal.

Hemp Pitfalls and Promise: Alarm Sounded by Midwest Grower
by Chris Bennett
Source: https://www.agweb.com/article/hemp-pitfalls-and.promise-alarm.sounded-midwest-grower

Farmer beware. Pitfalls and genuine promise make up a hemp cauldron set to high boil in 2019—yet the temperature will get even hotter, warns producer Chris Adams. “There is no secret knowledge about this crop: The real truth is it’s a crapshoot right now.”

Going no holds barred on profit, genetics, seed costs, mortality, and more, Adams offers a blunt assessment from the front lines of hemp farming, and urges growers toward a hard reality check. “Who do you trust? You better take a hard look because there’s so much going on in hemp.”

Trojan Horse
After four years of growing experience and a host of invaluable lessons learned, Adams, 32, is emerging as a leading hemp producer in the Midwest. He tends a diverse crop roster on 9,000 acres located on both sides of the North Dakota-Minnesota line in fertile Red River Valley soils: sugarbeets, hard red spring wheat, hemp, soybeans, and six varieties of specialty dry beans. Bucking the middleman, Adams also operates an export business, and delivers crops (via containers loaded and sealed on-farm) straight from his fields to the doorsteps of foreign buyers. Convention ranks low on Adams’ priority list and his maverick approach afforded early entry into seed hemp in 2016, soon followed with hemp for CBD purposes.
As hemp acreage cranks up across the U.S., with 78,176 acres grown in 2018 and 511,442 acres licensed in 2019, Adams sends out a strong warning: “For potential growers or guys just starting, you have to realize there are a lot of scoundrels out there and you’d best be selective as to who you get information from. Also, so many people don’t realize how little they actually know, and others think they know because they were told by someone else, and it’s likely they’re banking on false information. When you buy seed and grow hemp, it’s very, very important to know you have a good source. I’d guess 80% of the information I see is partially wrong or completely false.”

Adams predicts dismal results in many states during the 2019 harvest. “There’s going to be a big chunk of CBD acreage that isn’t sellable due to genetics or being too hot on THC. Maybe people don’t want to hear this stuff, but that’s how it’s going to be for a while.”

Genetics, Adams contends, is the single biggest hemp concern at present. Feminized seed can cost up to $1-$2 per seed, an amount that adds fuel to scam fires. Adams insists fraud is frequent: “When someone pays $2 for a seed—and that’s not a clone or seedling—just a seed, then suddenly every Tom, Dick and Harry is a master breeder, and they charge forward with no proper strains or stabilizing genetics. They plant, fertilize and sell it as feminized seed, make several million bucks, and then you’ll never see them again. This type of fraud is real and guys have to know that.”

Adams has the battle scars to back his words. In 2018, he bought a batch of clones from Colorado that served as Trojan horses. After planting the purported clones on 3.5 acres of ground and anticipating a good harvest as the plants climbed nearly 7’ tall by September, Adams found 2,000 males carrying fat pollen pouches in the field—verboten for CBD hemp which requires all-female production. Salt in the wound, even the plants he was able to harvest from the Colorado source produced an abysmally low CBD level of 1.5%.

“Ignorance can get you leached if you just listen to anyone and start off doomed from the get-go. After this year, guys are going to get more selective, but these problems aren’t just going to go away overnight. Safe to say, bad genetics is going to be a problem for at least several years, and that’s just a single aspect of hemp fraud—there are others.”

Adams views CBD purity claims from a highly dubious perspective, and hopes pending USDA regulation will lay down proper oversight. “I don’t know what is going on with extraction, but I’d bet 70%-80% of CBD products on the shelf are not what they’re labeled. That means a lack of know-how and a lack of integrity. Don’t tell me the crap sold in convenience stores contains real CBD. I don’t know what’s in it, but I guarantee it’s some really Wild West stuff.”
Adams fields six to seven calls per day from potential hemp growers, often asking questions on the basic differences between production for CBD, seed and fiber. “Even now, there are plenty of guys that don’t know the difference. They get offers on seed contracts for CBD production. Sure, you can get CBD from seed hemp, but the CBD percentage is tiny, maybe 1%-2%, but I’m not sure the growers are told that. They’ll have to process into an isolate and it’ll take an unreal amount of plant material to get a good amount of CBD isolate.”

Wake Up Time
Many of Adams’ concerns are echoed by Bob Pearce, a professor of agronomy with University of Kentucky Extension. Hemp production, Pearce explains, is subject to knowledge gaps—a major source of jeopardy for growers. “If a grower is approached by somebody claiming to have all the answers, I see red flags. Right now, we’re relying on limited information backed by solid research, and it’s hard to prove or refute all the claims.”

Management is a key area where bad hemp advice does heavy damage, Pearce says: “At first, people said hemp didn’t need much attention and it was ideal for marginal ground. No, we have already seen that it needs good ground for real success—lots of care and attention.”

The scramble for seed, potentially lucrative contracts and lack of information can be a recipe for impropriety. “You can’t look at a seed and tell if it’s feminized. Right now, we’ve got a lack of seed certification and lack of knowledge, so people are unfortunately able to commit fraud. I certainly hope that’s not the majority of what we’re dealing with, but you can’t protect yourself if you pretend otherwise.”

Pearce advises growers to ask questions and perform basic research. “Start with simple online searches. In Kentucky, for example, you can go to the department of ag online and look up approved and cautionary varieties. Ask a supplier to provide proof of a variety meeting THC requirements; maybe results from a certified lab. Sure, somebody could manufacture those on paper, or substitute one variety for another, but in the absence of seed certification programs, those are good starts for due diligence.”

Bottleneck Pressure
Adams currently has 700 acres of seed hemp (half the acreage is for certified seed) and 100-plus acres of CBD hemp, tended by a high school chopping crew to control weeds. Passing on clones and seedlings in 2019, he spent two weeks preparing John Deere planters to deposit seed for CBD hemp at 99.9% accuracy at 20 acres per hour. By planting seed, Adams knew he faced mortality issues. Seed purchased from breeders is typically hand-cleaned and contains significant impurities (7-10%), he explains. “Germination is going to be lower out of the gate, maybe up to 10% of your field. Mortality is an issue because there’s no coating or protectant to put on the bare seed.”
That has to change and I’m working on some coatings to make seed more universal in size and help emergence.”

CBD hemp seed costs are highly variable, and Adams has paid across a range of 70 cents to $2 per seed. By 2020, as the market dust settles, he predicts prices to drop 50%, easing the bottleneck pressure on populations, mortality and seed costs.

As industrial hemp and CBD hemp acreage increases across the U.S., what about concerns over drift and cross-pollination? Outweighing drift, cross-pollination is a major worry for Adams. “Hemp can be very sensitive to various chemicals or heavy metals, for example, but we haven’t had any problems. In fact, there have been zero cases in North Dakota and Minnesota of chemical residue found in CBD oils.”

“As this moves farther along, there is going to be more and more hemp in the fields, and I’m afraid it’ll reach a saturation point where outdoor CBD hemp farming is not possible because of all the pollen floating around. In time, I think cross-pollination will be a big issue.”

Profit Per Acre
Even with Adams’ concerns over multiple facets of hemp farming, potential profits command grower attention. Seed hemp, in his geography, often yields 1,200 lb. per acre but can produce upwards of 2,000-plus lb. per acre. Extrapolating, if the market for seed is 50 cents per pound (subject to consistent fluctuations) and yield reaches 1,200 lb., then gross profit hits $600 per acre. However, the math changes quickly with big yields, and Adams has cleaned, bagged and dried seed at 2,000 lb. per acre. “I’d say 1,200 lb. is a fair mark and that’s what I equate with 70 bu. wheat when you’re shooting for 100 bu. All said and done, you can net $100-$150 per acre, but that number starts to seriously jump when you have big yields.”

Regarding profit potential for CBD hemp, estimates are skewed by considerable variables. For a ballpark figure, assume 1,000 lb. dry material per acre at 8% CBD and a market paying $3-$3.50 per percentage point per pound of CBD. “That’s about $28 per pound times 1,000, equaling $28,000 gross per acre. That’s the actual realm of what a grower can get, but that can also be way higher if you yield 3,000 or 4,000 lb. of material per acre.”

However, grower costs cover a wide spectrum. For example, if population is 2,500 plants per acre at $1 per seed, the simple math dictates $2,500 per acre in seed costs. “You’ve got fertilizer and irrigation costs, and you’ve got to factor in grunt labor too, and that might be $200 per acre. There’s not a lot of uniformity between costs for hemp farming, but the profit is there if you do it right.”
Projecting expenses for CBD hemp is a tricky proposition, particularly since variables change drastically from one operation to another. Industry standards are absent, and everything from planting to harvest can be wildly divergent, even within the proximity of hemp farming neighbors. When Adams began crafting a plan for 2019, intent on mechanized harvest, he penciled out sobering, but realistic input expectations for a roster of expenses: seed, land rent, fertilizer, irrigation equipment, labor, harvest equipment, and more. “Seed costs were extreme for 700,000 plants; $15,000 for drip; $30,000 for a well and pump; labor at maybe $125,000; $80,000 for tobacco equipment to cut the plants upright and set them on trailers. The more mechanized your harvest, the more CBD percentage you lose, but you also don’t want to hand-harvest hundreds of thousands of plants.” (In addition, Adams says growers should consider bucking machines to debud plants, stem trimmers and driers—all with hefty price tags.)

Permissible THC (tetrahydrocannabinol; a psychoactive chemical) levels within hemp vary between states, a hurdle Adams contends is a major problem for growers. “It’s red tape that really hurts and is going to screw over a lot of farmers. For many states, the level has to be below .3%, but the state testers sample the top 2” of vegetation—which contains the most concentrated levels of THC in the entire plant. A true sample should include the whole plant grinded up. The limit should be raised to 1%.”

The THC issue is far more than a red light versus green light test to gain state approval—it is a ball-and-chain drag on yield, Adams contends. “To get in under the state’s prescribed THC restrictions, you might have to harvest a month earlier to ensure you don’t rise above .3%. Just one month is a lot of pounds and a lot of percentage. For farmers, that means money left on the table, just because you have to navigate around the THC testing roadblock.”

The Gold Rush
How long might hemp production be subject to song-and-dance activity? A quick buck is a powerful catalyst, but Jesse Mondry, an attorney with Harris Bricken, and head of the firm’s Portland litigation team, believes improvements will take hold in fast time. “We’re dealing with a gold rush mentality, but as the hemp industry matures, the bad actors will get weeded out. The level of expertise of producers, processors and lawyers is going to get better very quickly.”

Fly-by-night hemp visions will lose ground to legitimate players, adds attorney Nathalie Bougenies of Harris Bricken. She warns of a heavy reliance on verbal agreements—a major risk to growers—and emphasizes the necessity of written agreements with detailed expectancies on CBD and THC levels, along with certificates of analyses from respected laboratories. “You need a clause in the agreement that makes the seller liable to reimburse the buyer.”
Bougenies notes a consistent lack of documentation with many clients, and urges growers to maintain a solid paper trail. “From the get-go, you’ve got to understand who you’re dealing with as far as licenses. Jurisdiction, chain of custody, compliance with state testing, purposes of the CBD related to rules and regulations, and much more have to be considered. First and foremost, focus on documentation in order to assess whether you are going into business with someone you can trust, and you have to insist on that documentation up front.”

Typical production contracts don’t carry much weight in the hemp industry, Mondry advises. “Standard agreements won’t work because the level of rules and regulations make it easy for farmers and processors to get into trouble.”

Escrow may be a layer of protection for growers to consider, with payment for seed or clones completed after contractual obligations are met. “You can pull your money out of escrow instead of filing a lawsuit. That’s a protection option you may need when there are shady characters in this industry and something that farmers have to think about,” he says.

“There is so much opportunity in hemp, but also lots of risk, because of a changing regulatory environment and a lack of established farming, contract and business practices,” Mondry adds. “Hemp sits entirely in its own basket and you cannot approach it as just a new commodity.”

Costly Secrets
Eyes wide open, Adams is bullish on hemp, but insists growers approach the new crop with caution. “This is forming into a great, great crop and the pieces will fall in place over time, but I’m already tired of guys pretending to know everything who don’t have a clue or who go around whispering about IP secrets. Those kind of guys are everywhere in hemp and they end up costing other farmers money. Do your homework and don’t settle until you find people you can trust.”

**Biologists track the invasion of herbicide-resistant weeds into southwestern Ontario**

BY UNIVERSITY OF TORONTO


TORONTO, ON (Canada) - A team including evolutionary biologists from the University of Toronto (U of T) have identified the ways in which herbicide-resistant strains of an invasive weed named common waterhemp have emerged in fields of soy and corn in southwestern Ontario.
They found that the resistance -- which was first detected in Ontario in 2010 -- has spread thanks to two mechanisms: first, pollen and seeds of resistant plants are physically dispersed by wind, water and other means; second, resistance has appeared through the spontaneous emergence of resistance mutations that then spread.

The researchers found evidence of both mechanisms by comparing the genomes of herbicide-resistant waterhemp plants from Midwestern U.S. farms with the genomes of plants from Southern Ontario.

"We used modern methods of genome analysis to look at the genetic similarity of different populations of these plants," explains Julia Kreiner, a PhD candidate in the Department of Ecology & Evolutionary Biology (EEB) in U of T's Faculty of Arts & Science and lead author of a study published today in *Proceedings of the National Academy of Sciences*.

"To our surprise, we found that the genomes of some resistant plants in Ontario were nearly identical to those in very distant U.S. plants. This was evidence that the Ontario plants were very closely related to the U.S. plants and suggests that the former came from seeds that were just picked up from one field and dropped in another." While Kreiner and her collaborators did not determine exactly how the seeds were physically transported, this propagation -- known as gene flow -- is typically accomplished in different ways. Seeds can be carried by water, or in the digestive tracts of animals, or from field to field by way of farm equipment. And especially with a wind-pollinated plant like common waterhemp, genes can also be spread via wind-borne pollen.
The same DNA analysis identified some resistant plants that did not genetically match any other plants suggesting they appeared through the independent emergence of a genetic mutation conveying resistance.

The researchers were surprised to discover both mechanisms at play. "We have two regions, Walpole Island and Essex County in southwestern Ontario, where waterhemp populations evolved resistance," says Stephen Wright, a professor in ecology & evolutionary biology at U of T and a co-author of the study.

"Because of their proximity, our expectation was that they would have shared the same origin of resistance. But our results suggest different origins -- from the movement of seed from a source population in the U.S. as well as independent evolution of resistance in a local population."

According to John Stinchcombe, also a professor in ecology & evolutionary biology at U of T and a co-author, "One of the most striking findings is that we see both ways that weeds could become resistant happening on really short time scales. Evolution is happening very quickly, and using multiple mechanisms."

Detlef Weigel, a co-author from the Max Planck Institute in Germany added, "Because herbicide-resistant waterhemp had appeared in the U.S. long before such plants were found in Canada, we were convinced that evolution of herbicide resistance is very rare and had occurred only once. Now that we know that it can occur repeatedly, the next question is whether one can slow down the evolution of new genetic variants that make waterhemp herbicide resistance."

In addition to the U of T cohort, co-authors included weed scientists from the University of Illinois and the University of Guelph Ridgetown Campus; and genome and developmental geneticists at the Max Planck Institute for Developmental Biology in Germany.

The researchers studied strains of the common waterhemp -- aka Amaranthus tuberculatus -- that are resistant to glyphosate, one of the most widely used herbicides in the world, commonly known by its trade name Roundup.

"Waterhemp is one of the most problematic agricultural weeds in North America," explains Kreiner. "In the U.S., common waterhemp and the closely related Amaranthus palmeri are causing all kinds of havoc in terms of crop productivity and crop yields." "Waterhemp first appeared in one county in Ontario in the early 2000s. And as of this year, we've found them in seven different counties in the province. So, it's spreading."
Kreiner suggests that the findings underline the importance of strictly following agricultural practices designed to minimize gene flow and staunch resistant strains as they arise.

"The fact that we're seeing a spread involving all of these mechanisms shows that managing the problem is a real challenge and that it will require integrating management approaches across different scales," explains Kreiner. For example, it illustrates the importance of thoroughly cleaning agricultural residue from rented farm equipment -- which is used on multiple farms in a season -- in order to minimize the transport of seeds from field to field.

"It also shows the importance of practices like rotating herbicides from season to season," says Kreiner. "And rotating crops between corn, soy and wheat. It's practices like these that will minimize the emergence of resistance and limit seed movement." At the same time, Kreiner warns that the occurrence of herbicide resistance is an inevitable evolutionary process and that the challenge requires further study.

"Management practices still don't treat the underlying cause, which is that herbicide resistance is evolving repeatedly," she says. "And so with these new genomic resources and approaches, I'm now trying to understand what makes a weed a weed. What are the factors that might make these weeds more likely to evolve resistance and be more problematic than others?

"At this point, we're running out of herbicides. These plants have evolved resistance to pretty much every herbicide we've come up with. And it doesn't seem like there's ever going to be a herbicide that a weed can't eventually evolve resistance to.

"There may be other strategies for controlling these weeds -- like weed-control technologies based on robotics and machine learning," she suggests. "But even then, the weed has a way to evolve around that, so it's a really difficult challenge."

**Fire Safety During Harvest Season**

By Dee Jepsen

Meteorologists would likely correct us if we referred to this year's summer climate as bipolar. However, the early fall rain patterns seem to be completely different depending on where one stands in the state. It is either rain, and lots of it – or dry, on the verge of drought. So when readers see an article about fire safety for harvest season, it is intended for those encountering dry and windy conditions, whenever these conditions appear. October and November are two months where fire is a particular concern. In agricultural areas, fires can break out during unseasonably warm temperatures.
Fire risks are particularly a concern around fields with dry crop residues, near woodland areas, or within equipment with heated bearings, belts, and chains. There are several aspects to consider for fire prevention and fire protection during harvest season.

**Preventing Combine Fires**
Combines are at high risk of fire. Work crews should take extra precautions to prevent fires from starting.

- **Park a hot combine away from out-buildings.** Keeping a combine out of barns, shed, and away from other flammables is a common prevention strategy in case a hot spot ignites. Insurance claims can double when equipment fires are responsible for loss of farm structures.
- **Regular maintenance is priority.** Check the machine daily for any overheated bearings or damage in the exhaust system. Keep the fittings greased. Maintain proper coolant and oil levels. Repair fuel or oil hoses, including fittings and metal lines, if they appear to leak.
- **Keep dried plant material from accumulating on the equipment.** Frequently blow dry chaff, leaves and other crop materials that have accumulated on the equipment with a portable leaf blower or air compressor. Be sure to inspect the engine compartment and other areas where chaff accumulates around bearings, belts and other moving parts.
- **Maintain the electrical system.** Pay attention to machine components that draw a heavy electrical load, such as starter motors and heating/cooling systems. Monitor circuits for any overloading, especially if fuses blow regularly. Keep wiring in good condition and replace frayed wiring or worn out connectors.
- **Refuel a cool engine whenever possible.** Never refuel a combine with the engine running. It is recommended to turn off the engine and wait 15 minutes; this helps to reduce the risk of a spill volatilizing and igniting.
- **Prevent static electricity while operating in a dry field.** Use a ground chain attached to the combine frame to prevent static charges from igniting dry chaff and harvest residue, letting the chain drag on the ground while in the field.
• **Have 2 fully charged fire extinguishers on the combine.** ABC fire extinguishers are recommended on farm machinery. In a combine, keep a 10-pound unit in the cab and a 20-pound unit mounted at ground level.

• **Have 1 fully charged fire extinguisher in the tractor, grain cart, and pickup truck.** ABC fire extinguishers are recommended on farm machinery. These extinguishers are good for fires at incipient phases – meaning at the first sign of smoke or a small flame. When a fire appears, it is important to put worker protection before saving equipment.

• **Have an emergency plan in place and be sure all employees know the plan.** Combine fires happen fast – be sure all employees know what to do if smoke or fire appears.

• **Turn off the engine.** If in the combine cab, turn off the engine and exit the machine.

• **Call 911 before using the fire extinguishers.** If the fire is in the cab, only use the 10-pound fire extinguisher from the outside of the cab – on the exterior platform. If the fire is on the ground, use caution when opening the engine compartment or other hatches as small fires can flare with extra air. Stay a safe distance away from the fire.

• **Use a shovel on small field debris fires.** Throwing dirt over burning field residue can stop a fire from spreading. However, stay back if the fire takes off.
<table>
<thead>
<tr>
<th>Location, OH</th>
<th>Tonight</th>
<th>Wednesday</th>
<th>Wednesday Night</th>
<th>Thursday</th>
<th>Thursday Night</th>
<th>Friday</th>
<th>Friday Night</th>
<th>Saturday</th>
<th>Saturday Night</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cortland, OH</strong></td>
<td>Partly Cloudy</td>
<td>Slight Chance T-storms then Showers Likely</td>
<td>High 66 °F</td>
<td>High 50 °F</td>
<td>High 58 °F</td>
<td>Low 41 °F</td>
<td>Mostly Sunny</td>
<td>Mostly Cloudy then Chance Showers</td>
<td>Low 66 °F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low 60 °F</td>
<td>Low 52 °F</td>
<td>Low 56 °F</td>
<td>Low 40 °F</td>
<td></td>
<td></td>
<td>Low 61 °F</td>
</tr>
<tr>
<td><strong>Jefferson, OH</strong></td>
<td>Slight Chance T-storms then Chance Showers</td>
<td>Showers Likely</td>
<td>Low 67 °F</td>
<td>Low 59 °F</td>
<td>Low 50 °F</td>
<td>Low 42 °F</td>
<td>Mostly Sunny</td>
<td>Mostly Cloudy then Chance Showers</td>
<td>Low 64 °F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High 59 °F</td>
<td>High 54 °F</td>
<td>High 50 °F</td>
<td>High 42 °F</td>
<td></td>
<td></td>
<td>Low 61 °F</td>
</tr>
</tbody>
</table>
Upcoming Events

October 17, 2019
ITOH Peonies – Trumbull County

October 22, 2019
Annual Fall 4-H Kickoff – Trumbull County

November 7, 2019
Earlybird PAT – Lake County
Gardeners’ delight, The original 10 acres of Kridler Gardens started as a botanical garden in 1965, when owner Barrie Kridler moved back to Homeworth after a 20-year residence in Texas. Sixty-five additional acres were added to the Homeworth operation in 1990.

Thousands of tree, shrubs and perennials have been incorporated into the grounds in order to showcase their landscape value. Thirteen greenhouses complete the operation including: 500 varieties of hosta, rare trees, shrubs, perennials and garden-related items.

Itoh Peonies (i.e. Intersectional Peonies) are an intentional mix of two amazing plants. Borrowing hardiness of traditional garden peonies, Itoh upright growing style, deeply-cut foliage, and prolific blooms of beloved tree peonies compliment their tailored shape. Itoh’s produce enormous flowers from many buds. There are often 50 blooms per plant in one season. Come learn how these Peonies can compliment your garden.

Complete the below information and send with payment to OSU Extension Trumbull County, 520 West Main Street, Cortland, OH 44410. Please make checks payable to OSU Extension.

Name:__________________________________________________________
Phone:_________________ Email:_________________________________
Number Attending: ________X $20/person = ___________________ Total Enclosed $ ____________

OHIO STATE UNIVERSITY
CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.
Trumbull County 4-H Presents

6th Annual Fall 4-H Kickoff
Tuesday, October 22, 2019
6:00-7:30 PM
TCTC Cafeteria
528 Educational Highway, Warren

4-H Grows Here!
Activities 🌼 Handouts 🌼 Free Food 🌼 Meet Our Clubs

How can you join 4-H in 2019-2020?
Join us for a county-wide 4-H club open house to kickoff a new 4-H season! Find your fit in one of our 30+ clubs! Ages 5-18.

Questions? Contact 4-H Educator, Ashlee Dietz at dietz.96@osu.edu or 330-638-6783.