Hello Northeast Ohio Counties!

We hope you all had a wonderful Memorial Day Weekend.

It is National Dairy Month! Thank a dairy farmer for all their hard work!

NE Ohio wheat crop started flowering last week. Since we have been so dry Fusarium Head Scab risk has been low. If we remain dry throughout flowering the risk will remain low.

Have a great week and stay safe!

Lee Beers        Andrew Holden        Angie Arnold
Trumbull County  Ashtabula County     Portage County
Extension Educator Extension Educator Extension Educator
**A Spring Full of Pesticide Law, Part 1**

By: Peggy Kirk Hall, Associate Professor, Agricultural & Resource Law

Source: [https://farmoffice.osu.edu/blog/tue-06012021-900am/spring-full-pesticide-law-part-1](https://farmoffice.osu.edu/blog/tue-06012021-900am/spring-full-pesticide-law-part-1)

Spring is a common time for farmers to deal with pesticides and insecticides, but this spring the legal system has also been busy with pesticides and insecticides. Important legal developments with dicamba, glyphosate, and chlorpyrifos raise questions about the future of the products, with proponents on both sides pushing for and against their continued use. In today’s post, we summarize legal activity concerning dicamba. Part 2 to this series will cover recent developments with Roundup.

**Dicamba registration lawsuits.** In April, the federal courts resumed two cases filed late last year that challenge the registration and label of dicamba products made by Bayer, BSF and Syngenta. The cases had been on hold since February due to the change to the Biden Administration and its EPA leadership. *Center for Biological Diversity v. EPA*, in federal district court in Arizona, claims that the 2020 registration of the products should not have been granted because the registration fails to meet the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) standard that a pesticide may not cause “unreasonable adverse effects” to the environment. Relief requested by the plaintiffs includes overturning the registration approvals and also ordering EPA to officially reverse via rulemaking its long-standing policy to allow states to impose local restrictions on pesticide registrations under FIFRA’s Section 24(C).

In the D.C. district court, *American Soybean Association v EPA* takes the opposite approach and argues that the EPA exceeded its duties under FIFRA by imposing application cutoff dates of June 30 for soybeans and July 30 for cotton and establishing 310-foot and 240-foot buffer zones for certain endangered species. The plaintiffs in that suit want the court to remove the cutoff dates and buffer restrictions from the approved dicamba labels. Manufacturers Bayer, BASF, and Syngenta have intervened in the cases, which both now await responses from the EPA.

Two additional challenges to the dicamba 2020 label approval were consolidated for review to be heard together by the D.C. Circuit Court of Appeals and now await the court’s decision. *National Family Farm Coalition v. EPA* originally filed in the Ninth Circuit Court of Appeals, argues that EPA failed to support its conclusion of “no unreasonable adverse effects” and did not ensure that endangered species and critical habitat would not be jeopardized by approved dicamba use. On the flip side, *American Soybean Association v. EPA* alleges that the 2020 label cutoff dates are too restrictive and buffer requirements are too large, which exceeds the authority granted EPA in FIFRA and the Endangered Species Act. The EPA has filed a motion to dismiss the cases but the plaintiffs have asked to be returned to the Ninth Circuit.
Bader Farms Appeal. The $265 jury verdict awarded last year to Bader Farms, which successfully argued that Monsanto was responsible for harm to its peach farms resulting from dicamba drift, is on appeal before the Eighth Circuit Court of Appeals. Monsanto filed its brief on appeal in March, arguing that the verdict should be reversed for several reasons: because the court had not required Bader Farms to prove that Monsanto had manufactured or sold the herbicides responsible for the damages, which could have resulted from third party illegal uses of herbicides; because the damages were based on “speculative lost profits”; and because the $250 million award of punitive damages violated state law in Missouri.

Office of Inspector General Report. The EPA’s Office of the Inspector General (OIG), also played a role in recent dicamba developments. The OIG is an independent office within the EPA that audits, investigates and evaluates the EPA. Just last week, the OIG issued a report on EPA’s decision in 2018 to conditionally register dicamba products, allowing them to be used during the 2019 and 2020 growing seasons. That decision by EPA ultimately led to a legal challenge by environmental groups, a holding by the Ninth Circuit Court of Appeals that the EPA violated FIFRA in approving the registrations, and a controversial order ceasing use of the dicamba products. The OIG evaluated the EPA’s registration decision making process for the dicamba registration. The title to its report, “EPA Deviated from Typical Procedures in Its 2018 Dicamba Pesticide Registration Decision” is telling of the OIG’s conclusions.

OIG determined that EPA had “varied from typical operating procedures” in several ways. The EPA did not conduct the required internal peer reviews of scientific documents created to support the dicamba decision. Senior leaders in the EPA’s Office of Chemical Safety and Pollution Prevention were “more involved” in the dicamba decision than in other pesticide registration decisions, resulting in senior-level changes to or omissions from scientific analyses to support policy decisions. EPA staff were “constrained or muted in sharing their scientific integrity concerns” on the dicamba registrations. The result of these atypical operating procedures by the EPA, according to the OIG, was substantial underestimation or lack of acknowledgement of dicamba risks and the eventual decision by the Ninth Circuit to vacate the registrations. The OIG recommended three actions the EPA should take in response to the report: requiring senior managers or policy makers to document changes or alterations to scientific opinions, analyses, and conclusions in interim and final pesticide registration decisions along with their basis for changes or alterations; requiring an assistant administrator-level verification statement that Scientific Integrity Policy requirements were reviewed and adhered to during pesticide registration decisions; and conducting annual training for staff and senior managers and policy makers to promote a culture of scientific integrity and affirm commitment to the Scientific Integrity Policy. The EPA had already taken action on the OIG’s first and third recommendations but has not resolved the second.
Will the OIG Report affect ongoing litigation on dicamba, or lead to additional lawsuits? That’s a critical question without an immediate answer, and one to keep an eye on beyond this spring.

To read more about legal issues with dicamba, visit our partner, The National Agricultural Law Center and its excellent series on "The Deal with Dicamba."

**Better Popping Potential for Popcorn**

By Emily Matzke


Popcorn. What would movies and sporting events without this salty, buttery snack? America’s love for this snack goes beyond these events. We consume 15 billion quarts of popped popcorn each year.

When it comes to popcorn, consumers want a seed-to-snack treat that leaves more snacks than seeds when popped. This means when they pop the corn, there shouldn’t be many unpopped kernels left in the bowl.

Maria Fernanda Maioli set out to determine the properties affecting popping expansion in popcorn. The team’s research was recently published in *Agronomy Journal*, a publication of the American Society of Agronomy. The yellow popcorn is the type most people are familiar with. This is the type commonly used by movie theaters. Credit: Maria Fernanda Maioli

“The way kernels expand is a basic, yet very important characteristic of popcorn,” says Fernanda Maioli. This is referred to as “expansion ratio.”
“Very hard grains burst when heated. This expansion multiplies the initial volume of the grains by more than 40 times. In the case of popcorn, it produces a unique and tasty food.”

The major factors that influence popcorn quality are kernel moisture, expansion ratios, and popping ratios. Higher quality popcorn is associated with kernels that expand more. This popped corn has a better texture and softness.

There have been several past studies on the ways popcorn kernel expand. These studies report that popping expansion has a strong association with higher starch content in kernels.

Previous research also shows that popcorn varieties with a thicker protective outer seed coating—have a greater expansion ratio.

Popping ability is also affected by how well the starchy substance inside kernels transfer heat during the popping process. Fernanda Maioli and her team’s study measured this performance, which makes this research unique.

“We observed how this heat transfer inside the popcorn kernel relates to the expansion ratio,” she adds. “It allowed us to understand how other characteristics may also relate to expansion.”

“The purpose of our study was to identify popcorn characteristics related to expansion,” says Fernanda Maioli. “This will help us efficiently identify popcorn varieties with good agronomic characteristics as well as good popping quality.”

The team evaluated 49 types of popcorn for different traits. The traits included grain yield, kernel length, popping expansion, kernel and protective layer thickness, heat transfer ability, and the amount of protein in kernels.
Then the researchers studied the influence of those characteristics on the popping expansion.

“Our results showed that the thickness of the kernel’s outer layer is a key trait for selecting popcorn with greater popping expansion,” says Fernanda Maioli. Understanding which popcorn traits are related to the expansion capacity will help future researchers identify and breed high quality popcorn. Researchers will not need to spend time and money to look at other unrelated characteristics.

The team hopes they can identify relationships between other key traits. Future research will continue to improve the tasty, buttery snack.

Maria Fernanda Maioli is a researcher at the State University of Maringá in Brazil.

**How Fast is too Fast?**

By Amber Friedrichsen


Engines are revving up as first-crop hay cutting approaches. Before stepping on the gas pedal, though, know the operating limits of mowing machines to ensure a successful harvest.

Disc mowers have largely displaced sickle bar mowers in the nation’s hayfields, with disc configurations allowing for faster ground speeds. However, if speed impacts the quality of cut, it might be time to pull back on the reins.

“A critical travel speed for mowing is defined as the maximum speed a machine can travel without leaning the crop forward as it passes and maintaining a clean cut of the crop,” says Brian Luck with the University of Wisconsin-Madison.
The extension agricultural engineer explains in a recent issue of the Midwest Forage Association’s *Forage Focus* that two factors of cutting productivity are width and speed. Width is fixed by design, so one way to improve productivity is to invest in wider equipment. Another option is to pick up the pace, but moving too quickly might leave stems with rough and ragged edges that can impair regrowth.

Luck notes the American Society for Agricultural and Biological Engineers Standard for Machinery Management Data gives an average mowing speed range for grass and alfalfa as 7 to 14 miles per hour with an average of 10.5, but he adds the data for this calculation is somewhat old.

In 2018, the world record for acres mowed in an eight-hour day documented an average mowing speed of 19 mph. Faster yet, Luck says some mowing machines are being tested at speeds over 25 mph.

Even though mowers have the capacity to reach high speeds, adverse field conditions can make farmers pump the brakes. Factors like field roughness, obstructions in the soil, and soil moisture should be navigated at a reduced pace.

“Rough fields can cause damage to the machine, so going slower would be recommended,” Luck advises. “Obstructions, such as rocks, tile holes, or foreign objects can also cause substantial damage to hay mowing machines.”

In addition to damaging machinery, operating in wet conditions can cause damage to a field. Tires can drag through the mud and machines are at risk of getting stuck when soil moisture is high. Trying to go faster in these conditions can be even more harmful.

Another thing to consider is high-yielding crops. Luck says dense grass might require mowers to move more slowly through them. Power availability of the tractor can also limit mowers in these situations.
Identifying challenges within a field and adjusting speed accordingly will help determine a proper mowing pace. Maximum productivity will only be achieved when a machine is working optimally and producing a quality cut.

“Ensuring a clean cut of the crop is a priority during harvest,” Luck asserts. “When operating this spring, be mindful of how your mower is performing and be sure you are within its operating limits when it comes to speed.”

**Fungus Fights Mites that Harm Honey Bees**

By: Scott Weybright, College of Agricultural, Human, and Natural Resource Sciences

PULLMAN, Wash. – A new fungus strain could provide a chemical-free method for eradicating mites that kill honey bees, according to a study published this month in *Scientific Reports*.

A team led by Washington State University entomologists bred a strain of Metarhizium, a common fungus found in soils around the world, to work as a control agent against varroa mites. Unlike other strains of Metarhizium, the one created by the WSU research team can survive in the warm environments common in honey bee hives, which typically have a temperature of around 35 Celsius (or 95 F).

“We’ve known that metarhizium could kill mites, but it was expensive and didn’t last long because the fungi died in the hive heat,” said Steve Sheppard, professor in WSU’s Department of Entomology and corresponding author on the paper. “Our team used directed evolution to develop a strain that survives at the higher temperatures. Plus, Jennifer took fungal spores from dead mites, selecting for virulence against varroa.”

Jennifer Han, a post-doctoral researcher at WSU, led the breeding program along with WSU assistant research professors Nicholas Naeger and Brandon Hopkins. Paul Stamets, owner and founder of Olympia-based business *Fungi Perfecti*, also contributed to the paper. Stamets is a fungi expert, well-known for using several species in applications ranging from medicine to biocontrol.

Varroa mites seen living on a honey bee. Mites weaken bees’ immune systems, transmit viruses, and siphon off nutrients. Photo by Scott Bauer, USDA Agricultural Research Service.
Varroa destructor mites, small parasites that live on honey bees and suck their “blood,” play a large role in Colony Collapse Disorder, which causes beekeepers to lose 30-50% of their hives each year. The mites feed on bees, weakening their immune systems and making them more susceptible to viruses.

The main tools beekeepers use to fight varroa are chemicals, such as miticides, but the tiny pests are starting to develop resistance to those treatments, Naeger said.

Metarhizium is like a mold, not a mushroom. When spores land on a varroa mite, they germinate, drill into the mite, and proliferate, killing it from the inside out. Bees have high immunity against the spores, making it a safe option for beekeepers. Stamets, who did some of the initial testing with Metarhizium that showed the fungus couldn’t survive hive temperatures, was impressed by the work done by the WSU researchers.

“Science progresses through trial and error, and my technique wasn’t economical because of the hive heat,” he said. “But Jennifer did enormous amounts of culture work to break through that thermal barrier with this new strain. It’s difficult to really appreciate the Herculean effort it took to get this.”

Han and Naeger screened more than 27,000 mites for levels of infection to get the new strain.

“It was two solid years of work, plus some preliminary effort,” Han said. “We did real-world testing to make sure it would work in the field, not just in a lab.”

This is the second major finding to come from WSU’s research partnership with Stamets involving bees and fungi. The first involved using mycelium extract that reduced virus levels in honey bees.

“It’s providing a real one-two punch, using two different fungi to help bees fight varroa,” Stamets said. “The extracts help bee immune systems reduce virus counts while the Metarhizium is a potentially great mite biocontrol agent.”

The next step is to seek approval from the Environmental Protection Agency to use Metarhizium on hives used in agriculture. The team must also finalize delivery methods for beekeepers to apply the fungus in hives.

“We hope in 10 years that, rather than chemical miticides, Metarhizium is widely used to control Varroa mites,” Sheppard said. “And that the mite problem for beekeepers has been significantly reduced.”

The team thinks the methods they developed to evolve Metarhizium for varroa control could be used to improve biocontrol agents in other crop systems as well.
The majority of the funding for this work came from private donations from individuals and foundations. Additional funding came from Washington State Department of Agriculture (WSDA) Specialty Crop Block Grant K2531 and the USDA National Institute of Food and Agriculture, Hatch 1007314.

The History of the Development of the Large Round Bale

By: R. W Van Keuren
Source: https://u.osu.edu/beef/2021/05/26/the-history-of-the-development-of-the-large-round-bale/

In 1964, R.W Van Keuren, an Ohio State University professor of agronomy and OARDC forage researcher, initiated a study on pasture for beef cows and calves at OARDC’s Southern Branch near Ripley and Southeastern Branch near Carpenter, in cooperation with Ohio State’s Department of Animal Science and the OARDC outlying Branches. Several years later the studies were expanded to OARDC’s Eastern Ohio Resource Development Center at Belle Valley. The hill lands of this region appeared to be a good area for beef cow-calf production. Although initially low in pH and phosphorus and low to medium in potash, the soils generally responded well to fertilization and had good forage yield potential.

Because wintering represents two-thirds of the beef cow feed costs, the pasture studies were expanded to include year-round grazing. This all-season system included wintering the cows on small round bales left in the field and on the accumulated summer and fall regrowth. The bales were made with an Allis-Chalmers Rotobaler. The bales weighed about 40 to 50 pounds and kept well when left in the field where

Charlie Boyles, manager, EOARDC, and a Hawkbilt large untied bale, 1973
dropped. The herds were gazed during the summer pasture season on orchardgrass or bluegrass, with tall fescue used for the wintering portion. The early studies were with . . .

Continue reading The History of the Development of the Large Round Bale