

PESTICIDE REPORTS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University
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OSU PESTICIDE EDUCATION TWITTER ACCOUNT

The OSU Pesticide Safety Education Program now has a twitter account as another option in providing you pesticide and applicator information plus regulatory updates.

This will be a platform to communicate information that occurs between the releases of the monthly newsletter. This Twitter account will supplement this monthly newsletter and allow us to communicate information that occurs between the releases of each month's newsletter.

Find us on Twitter at [@OkstatePestEd](https://twitter.com/OkstatePestEd)

EPA ANNOUNCES FEDERAL REGISTER NOTICE REGARDING THE AVAILABILITY OF WORKER PROTECTION TRAINING MATERIALS

EPA is notifying the public that the Agency intends to publish in the Federal Register a notice stating the pesticide safety training materials with the expanded content required by the 2015 FIFRA Worker Protection Standard (WPS) are available for

use. The notice of availability will be published in docket EPA-HQ-OPP-2011-0184 on www.regulations.gov.

The training materials with expanded content have been available at the [Pesticide Education Resources Collaborative](#) (PERC) and were developed through an EPA cooperative agreement. EPA also approved training materials developed by other organizations, some of which are available on PERC's website. Updated training materials must be used 180 days after the publication of the notice in the Federal Register.

EPA revised the WPS to implement more protections from pesticide exposure incidents for agricultural workers, handlers, and their families. Note that EPA has initiated a process to revise certain requirements in the WPS. EPA plans to publish a Notice of Proposed Rulemaking later in 2018 to solicit comments on proposed revisions to the WPS requirements for minimum ages, designated representatives, and application exclusion zones. If the changes to the requirements are finalized, these safety training materials will be amended to reflect such changes. Until such time, all requirements are in effect.

For more information on the WPS, visit www.epa.gov/pesticide-worker-safety/agricultural-worker-protection-standard-wps. (EPA, June 14, 2018) <https://www.epa.gov/pesticides/epa-announces-federal-register-notice-regarding-availability-worker-protection-training>

FLORIDA TEEN TESTS POSITIVE FOR MOSQUITO-BORNE KEYSTONE VIRUS

Researchers from the University of Florida have confirmed that the virus called Keystone made the jump from infecting only animals to infecting humans, Tech Times reported.

In a report published in the journal Clinical Infectious Diseases on June 9, the researchers said that the first known case of the Keystone virus has been confirmed in a teenage boy after a year of tests and analyses.

The 16-year-old boy contracted the virus while attending a band camp in Florida last summer. He suffered from fever and severe rash. The boy was tested for Zika and related pathogens because the period when the boy got sick coincided with the Zika virus epidemic in the Caribbean and Florida.

The findings are yet another indicator of the range of diseases that can be caused by mosquito bites in Florida, in keeping with a recent study by the U.S. Centers for Disease Control and Prevention that highlighted the almost doubling of vector-borne disease cases in the United States since the early 2000s.

“Although the virus has never previously been found in humans, the infection may actually be fairly common in North Florida,” said J. Glenn Morris, M.D., M.P.H., director of the UF Emerging Pathogens Institute and corresponding author of the report on the virus published June 9 in the journal Clinical Infectious Diseases.

“It’s one of these instances where if you don’t know to look for something, you don’t find it,” he added.

The virus, called “Keystone virus” after the location in the Tampa Bay area where it was initially identified in 1964, has been found in animal populations along coastal regions stretching from Texas to the Chesapeake Bay. (PCT, June 28, 2018) <http://www.pctonline.com/article/florida-keystone-virus-confirmed/>

HERBICIDE INJURY REPORTED

EPA Weighs Dicamba Registrations as Injury Reports Mount

Editor's Note: Following publication of this story on Wednesday, June 20, the University of Missouri released information compiled from university weed scientists estimating that as of June 15, nearly 384,000 acres of soybeans are exhibiting dicamba injury symptoms. The state of Illinois accounted for 150,000 of the acres that have allegedly sustained injury so far in 2018. Details of this survey can be

found at
<https://ipm.missouri.edu/IPCM/2018/6/dicambaInjuryUpdate/>

ROCKVILLE, Md. (DTN) -- As herbicide injury reports mount in the Midwest and South, state regulators and EPA are watching the situation closely.

Dicamba is facing the most alleged injury reports so far, and 2,4-D injury complaints are also an issue in some Southern states. So far, dicamba injury complaints are most numerous in Southern states, but they are also beginning to be reported in Midwestern states, where post-emergence dicamba spraying in Xtend soybeans is still underway and double-crop soybeans have yet to be sprayed.

Injury to non-soybean crops and plants, such as vegetables, fruit, ornamentals and trees, is being seen at a higher rate than last year, weed scientists told DTN.

EPA is planning to make a decision by mid-August on whether or not to extend the registrations of XtendiMax, Engenia and FeXapan, which expire in November 2018, said Tony Cofer, president of the Association of American Pesticide Control Officials (AAPCO).

"Our goal is to make a regulatory decision in time to inform seed and weed management purchase decisions for the 2019 growing season," an EPA spokesperson told DTN via email.

AAPCO is monitoring dicamba injury reports and trying to give EPA a "real-time reporting" of the situation this summer, Cofer said.

THE DAMAGE SO FAR

The Missouri Department of Agriculture is facing 42 complaints of potential dicamba injury and 11 complaints of potential 2,4-D injury as of June 18, said Sami Jo Freeman, the department's public information administrator. State regulators from Tennessee are reporting 19 dicamba complaints, with Mississippi checking in at 13 this week, said Cofer.

In Arkansas -- where dicamba use is banned in season -- the state has nonetheless received 43 dicamba injury complaints -- about half as many as last year at this time, when growers had legal access to Engenia, added Adriane Barnes, director of communications for the Arkansas Agriculture Department.

AAPCO is starting to collect injury incidents farther north, as well, with states such as Iowa, Illinois, Indiana and Nebraska reporting a handful of official injury complaints so far. As spraying continues in first-crop soybeans and begins in double-crop soybeans, those reports will likely rise, said Purdue weed scientist Bill Johnson.

It may be difficult to know the full extent of damage this year, he cautioned.

"We believe we have a situation where less than 50% of the damage actually gets reported," he said. "Last year our state regulatory agency estimated only about 20% of dicamba injury was reported, and I think that won't be much different this year."

So far, the reports in Indiana look like physical drift, but volatility is likely to become an issue in the weeks ahead, he added.

"A lot of the reports right now are likely from physical drift based on the fact that we did have some very high wind speeds recently," he said. "But starting last week, we had stretch of mid-90s temperatures, and it wouldn't surprise me to see volatility issues become a bigger deal."

INJURY TO NON-SOYBEAN ACRES

Last year, Xtend soybeans accounted for roughly 20 million acres; this year, the number has swelled closer to 40 million acres.

So while more soybeans are protected from dicamba damage, there is a greater risk of injury to other sensitive crops and plants from the significant increase in dicamba use, Johnson noted.

"Non-soybean complaints are definitely higher," he said. "Things like trees, vegetables, ornamental plants and commercial nurseries."

University of Missouri weed scientist Kevin Bradley echoed this observation, calling it "a consistent theme that my colleagues and I are seeing."

Freeman told DTN that in addition to 3,107 potentially injured soybean acres, Missouri has dicamba complaints for 1,445 tomato plants, 514 acres of peaches, 75 acres of watermelons, 50 pepper plants, two greenhouses with vegetables, personal gardens, grapes, 15 rose bushes, and more than 12 acres of trees.

The damage is worst in the southeastern region of the state, known as the Bootheel, which accounts for 76% of the dicamba injury complaints in the state so far, Freeman added.

These reports will play a major role in the conversation about the future of dicamba use in agriculture, as they involve the general public, noted Johnson.

"We have a sensitized audience out there this year," he said. "Not just in agriculture, but also the non-ag audience, just based on the fact that many people that live in rural areas got hit last year, and dicamba damage is pretty easy to pick out."

In email correspondence with DTN, BASF, Corteva and Monsanto offered prepared statements urging all growers and applicators to concentrate on stewardship and following label directions. (DTN Progressive Farmer, April 30, 2018)
https://www.dtnpf.com/agriculture/web/ag/news/crops/article/2018/04/30/common-types-label-dicamba-use?referrer=twitter#.Wub_RiLOGAA.twitter

GLYPHOSATE USE ON US SOYBEANS SLIPS AGAIN

Glyphosate herbicide was applied to 76% of the US soybean acreage last year, according to a recent survey by the USDA's National Agricultural Statistics Service (NASS). That compares with 85% when the NASS last surveyed agrochemical usage

on soybeans in 2015 and 90% in 2012. Two forms of glyphosate were the most widely used active ingredients on the crop in all three surveys. In 2017, some 44.2 million lbs (20,049 tonnes) of the isopropylamine salt were applied to 46% of the area and 40.3 million lbs of the potassium salt were used on 30% of the crop. The NASS conducted the survey in 16 states, which accounted for 92% of the 90.1 million acres (36.5 million ha) of soybeans planted in the US last year.

The next most popular herbicides used on soybeans last year by area were sulfentrazone (applied to 22% of the acreage), fomesafen-sodium (19%) and metribuzin (18%). Applications of sulfentrazone amounted to 3.3 million lbs, fomesafen-sodium 3.9 million lbs and metribuzin 3.7 million lbs.

Herbicides were applied to 95% of the crop compared with 96% in the previous survey. Insecticides were used on 19% of the acreage (22% in 2015) and fungicides 14% (11%).

Wheat

As in the 2015 and 2012 surveys, the vast majority spring wheat crops were treated with herbicides in 2017. Some 93% (99%) of the durum wheat crop received a herbicide treatment and 96% (96%) of other spring wheat was treated. The survey found that 61% (61%) of winter wheat was sprayed with herbicides. The wheat survey was conducted in 18 states, which accounted for 90% of the 46 million acres.

The most widely used herbicides on durum wheat were the isopropylamine salt of glyphosate (1 million lbs on 58%) and fluroxypyr (100,000 lbs on 39%). On other spring wheat, the herbicides most used by acreage were fluroxypyr (400,000 lbs on 46%) and glyphosate isopropylamine salt (3.2 million lbs on 37%). The leading herbicides on winter wheat were glyphosate isopropylamine salt (8.2 million lbs on 22%) and 2, 4-D (2.6 million lbs on 18%).

Cotton

Herbicides were applied to 91% (92%) of the cotton crop last year, with glyphosate being the most used. Some 10 million lbs of the isopropylamine salt were applied to 59% of the acreage and 4.1 million lbs of the potassium salt were used on 18%. The next three most popular herbicides by acreage were trifluralin (2.3 million lbs on 23%), diuron (1.1 million lbs on 23%) and glufosinate-ammonium (1.2 million lbs on 17%). The survey was conducted in nine states representing 89% of the 12.6 million acre crop. Desiccants and other chemicals were applied to 69% of the area, insecticides on 43% and fungicides on 1%.

DOES AGRICULTURE NEED RESET KEY ON HERBICIDES?

When is agriculture going to hit the reboot key? Our efforts to keep herbicides on target are not working. Ten years ago when glyphosate began to fail on Palmer amaranth and LibertyLink soybeans were coming back off the shelf, a major seed company agronomist (who is an excellent weed scientist) proudly told me “we are bypassing LibertyLink and going straight to the auxin era.” I thought at the time that I wished I could share his enthusiasm about the auxin era. My experience with auxin herbicides over 30 years (at the time) told me that trying to spray large acreages in the summer would not be easy.

I recently had a university weed scientist tell me, “I don’t feel like a weed scientist anymore — I’m just a drift walker.” I share those sentiments and this is nuts! I get far more calls about off-target herbicides than I do weed control calls, and almost every field visit request is to look at a damaged field. In most cases there isn’t a lot I can do other than just be sympathetic and try to listen. Off-target herbicide issues are creating tremendous discord in communities — often among people who have been lifelong friends and neighbors.

Nobody understands the need for new weed control technology any better than I do. The auxin herbicides like dicamba, 2,4-D and now Loyant are very powerful herbicides for controlling weeds, which is a good thing. However, trying to use them on large acreages in the summer, just like they were any other herbicide, is difficult and in some cases impossible. Because of major off-target issues, regardless of the cause, the dicamba technology has been the most divisive in my career. It remains to be seen if 2,4-D can be used in close proximity to cotton, but my gut tells me probably not.

I was recently told my last article on Loyant was prophetic, but I could see it coming for two years. Given the characteristics of the herbicide and what we already knew about soybean sensitivity along with what it is like trying to apply rice herbicides with aircraft in the real world, it was entirely predictable. The right kind of real world testing wasn’t done nor was the necessary education. Then when the wheels come off, it is always a label violation and somebody else’s fault.

I don’t know what the reset button looks like, but we cannot continue down the path we are going. Companies are going to have to assume some responsibility as we continue to roll out herbicides that have tremendous upside but also very predictable downside. There will always be enough off-target issues simply due to honest mistakes and judgment errors. However, there is no excuse for going into those that are predictable and then trying to act like everything is fine.

Everyone is looking to someone else to solve the problem. If agriculture cannot fix the problem, someone will fix it for us. I never dreamed that in my career I would see the magnitude of off-target herbicide issues, the adverse impact they are having and at the same time folks running around trying to act like everything is OK. (Delta FarmPress, June 20, 2018)

<http://www.deltafarmpress.com/commentary/does-agriculture-need-reset-key-herbicides>

WHAT GLOBAL WARMING TRENDS MEAN FOR MOSQUITOES

As temperatures rise with climate change, mosquito season extends past the summer months in many parts of the world. Some researchers have questioned how this lengthened season influences the risk of being infected with mosquito-borne diseases such as dengue, chikungunya and Zika.

Now, in a paper published on April 27, 2017, in *PLoS Neglected Tropical Diseases*, Stanford University researchers modeled how rising temperatures might influence mosquito behavior and disease risk around the world. The researchers also calibrated their model with field data on human infections of mosquito-borne diseases.

“Dengue epidemics have been on the rise in the past couple decades so there’s been a growing effort trying to understand why we’re seeing more dengue, and what the relationship is between dengue transmission and climate,” said study lead author Erin Mordecai, an assistant professor of biology.

THE IDEAL TEMPERATURE.

Temperature controls several factors that underlie the time it takes for a virus to be transmittable to humans. These include how long it takes for a mosquito to ingest a virus during one feeding and then be ready to inject it in a later feeding; the length of the mosquito’s life cycle; and how often mosquitoes bite.

“All these traits rely on temperature, but they tend to be nonlinear,” Mordecai said. “They increase to a point and then drop off.” The group found that mosquito traits favorable to spreading disease peaked when temperatures reached 29°C (84°F), but were lower when temperatures were cooler or warmer.

When Mordecai looked at transmission of dengue, chikungunya and Zika in people, those results matched what her models predicted. She said that if you graph how transmission rates change with

temperature, you get a bell-shaped curve peaking at 29°C.

PREDICTING FUTURE OUTBREAKS.

Knowing the optimal temperature for disease transmission is critical for predicting future disease rates, Mordecai said. Before this study, she said, there was a wide range of temperature predictions from other researchers.

“If we’re predicting a 29°C optimum and another model is predicting a 35°C optimum, the other model will say that climate change will increase transmission,” she said, pointing out that if local temperatures are already close to the optimal temperature, infection may, in fact, go down as temperatures rise.

The information also can help predict how and where disease might spread with climate change. “We really want to build more predictive models that take climate information and make predictions about when and where we can invest in vector control to try to prevent epidemics,” Mordecai said.

This kind of planning is especially important in countries that have lower socioeconomic levels. “Concentrated urban poverty is really where you see a lot of vector-borne disease transmission,” Mordecai said. She explained that the mosquito that carries dengue, chikungunya and Zika is an opportunist — it will breed in any water container it can find, from bottle caps to water storage basins. “You tend to see a lot of people exposed to a lot of mosquitoes in places where access to piped water is not reliable, because storage basins are where people are storing water.”

Mordecai knows there is more work to be done with mosquito-borne illnesses. “There’s lots of discussion about what’s going to be the next thing. What’s the next Zika?” She said this model will help researchers predict when and where transmission of the next Zika might happen — and allow enough time to prepare for the event.

Other authors on the study include Prithvi Gudapati and Marta S. Shocket of Stanford; Jeremy M. Cohen, Michelle V. Evansc, Leah Johnson and

Jason R. Rohr of the University of South Florida; Catherine A. Lippi and Sadie J. Ryan of the University of Florida; Kerri Miazgowiec and Courtney C. Murdock of University of Georgia College of Veterinary Medicine; Van Savage of University of California Los Angeles; Anna Stewart Ibarra of SUNY Upstate Medical University; Matthew B. Thomas of Penn State University; and Daniel P. Weikel of University of Michigan.

The research was funded by a grant from the National Science Foundation — Ecology and Evolution of Infectious Disease. (PCT, June 10, 2018) <http://www.pctonline.com/article/what-warmer-weather-means/>

SCIENTISTS CONFIRM FIRST CASE OF WATERHEMP WITH SIX-WAY RESISTANCE

A study featured in the journal [Weed Science](#) is certain to keep many corn and soybean growers up at night. Researchers have identified a waterhemp population in Missouri that is resistant to a record-breaking six herbicide mechanisms of action.

It all started when growers in Randolph County, Missouri, reported a population of waterhemp that appeared to be resistant to 2,4-D. Researchers from the University of Missouri conducted field experiments that confirmed the 2,4-D resistance. But they also found the same waterhemp population was resistant to atrazine, chlorimuron, fomesafen, glyphosate and mesotrione. Of the eight herbicides applied, only dicamba and glufosinate provided acceptable control.

The results are sobering – especially for anyone waiting on the approval of 2,4-D-resistant corn and soybean as a way to manage glyphosate resistance. If we're already seeing 2,4-D resistance now, what will happen when use of the herbicide becomes even more commonplace?

Researchers say six-way resistant waterhemp demands a diversified approach. Rather than relying on glyphosate, 2,4-D or any other single herbicide, it's time to focus on a variety of appropriate cultural, mechanical and biological control tactics.

Want to learn more? Read the full text of the article "[Investigations of 2,4-D and Multiple Herbicide Resistance in a Missouri Waterhemp \(*Amaranthus rudis*\) Population](#)" in [Weed Science](#) Vol. 66, Issue 3.

(WSSA, June 18, 2018)
<http://wssa.net/2018/06/scientists-confirm-first-case-of-waterhemp-with-six-way-resistance/>

US COURT BATTLE LOOMS OVER XTENDIMAX REGISTRATION

US environmentalists are urging a federal court to vacate the EPA's registration of Monsanto's herbicide, XtendiMax (dicamba, diglycolamine salt), and pull the product from the market.

Their lawsuit alleges that the EPA's review of the human health and environmental effects was inadequate and fell short of requirements laid out by federal pesticide law and the Endangered Species Act.

The EPA granted Monsanto a two-year conditional registration for its herbicide in November 2016, approving uses on the company's genetically modified dicamba-tolerant Xtend cotton and soybeans in 34 states. Problems with drift and damage to non-target crops in more than 20 states prompted the EPA in October 2017 to adopt industry-recommended label changes that reclassified XtendiMax - and similar dicamba herbicides made by BASF and DowDupont - as "restricted use" and imposed additional training requirements.

CALIFORNIA ESTABLISHES TESTING FOR PESTICIDES IN MARIJUANA PRODUCTS

Having voted to allow retail recreational cannabis sales as of January 1, 2018, California will mandate testing for pesticide residue in cannabis products beginning July 1. Cannabis farmers welcome the regulations. Nikolai Erickson of Full Moon Farms in Dinsmore, California says, the new requirements will “clear the shelves of poor quality product and give small craft, organic farmers a chance to prove their quality over larger farms. . . . We’re the ones taking the time and energy, putting in the extra hours and the extra cost to ensure that we’ll pass testing. So we’re creating shelf space finally, getting value added for craft.”

The new California laws require that any cannabis products sold by retailers must have undergone both quality and pesticide testing. Whereas from January 1 to June 30, 2018 regulations mandated testing for 21 pesticides and for microbial contaminants, such as E. coli, that number jumps to 66 in July. The regulations also institute new quality standards that analyze products for contaminants, such as feces, mold, and insect and rodent parts. The quality “bar” will jump again in December, when testing must also look for mycotoxins, terpenoids, and heavy metals.

The stakes are high for producers and retailers: if a product batch fails two assays, the state will require that the entire batch be destroyed. In addition, retailers will have to restock their shelves, beginning July 1, with only products that have undergone the new, more stringent, evaluation. All this testing will cost producers, labs, and distributors more; EVIO Labs CEO Lori Glauser says, “The implementation of the new rules will be challenging for all the stakeholders to implement. . . . However, it’s absolutely going to result in improved quality of product and will give consumers peace of mind that the product that they’re purchasing is indeed what it says on the label and that it is free of contaminants.”

The lawsuit alleges that the EPA had ignored evidence there would be problems with drift and contends that the Agency has allowed a ten-fold increase in the use of dicamba without adequately assessing the potential economic harm to farmers or the potential damage to the environment, including risks to endangered and threatened species.

The EPA says that the Court should defer to its expertise and reject the complaint, arguing that its review of the pesticide was in “full compliance” with federal law.

The Agency is defending its decision to revise the labels for XtendiMax and the other dicamba herbicides, saying it took a “quick but protective approach” despite facing “uncertainty as to what caused the incidents” and limited regulatory authority.

The plaintiffs say that the amended registration had relied on the same flawed risk assessments used for the 2016 registration and contend that the EPA provided “no explanation or evidence” to support claims of increased efficacy and safety of the registered uses.

“Instead, the only evidence underlying the 2017 decision is the catastrophic growing season, showing that EPA’s previous analyses - which it is doubled down on in the 2017 decision - were wrong, and its mitigations grossly ineffective,” according to the May 29th filing with the US Court of Appeals for the Ninth Circuit.

The EPA failed to adequately address “volatility, tank mix risks, and the damage dicamba drift causes farmers” and its registration of XtendiMax violated federal law, the environmentalists say.

“There is only one remedy: vacating the registration,” they conclude.

The Court is planning to hold oral arguments on the complaint in September. (Pesticide & Chemical Policy/AGROW, June 13, 2018)

The Humboldt Patient Resource Center in Arcata has required its cannabis inventory to be tested for the past three years. The center made the decision to do so after it received product from cultivators who claimed no pesticide use, only to discover that the products were contaminated with pesticides. As owner Mariellen Jurkovich notes, “If you are buying any cannabis . . . and you’re not . . . buying it from where it’s been tested, you are risking your health,” Jurkovich said. “You are risking a chance that these things could be filled with very toxic chemicals.”

Beyond Pesticides has, for a number of years, tracked state-level policies on medical and recreational cannabis use. Because cannabis is not a legal agricultural crop under federal law, the Environmental Protection Agency (EPA) has not evaluated the safety of any pesticide on cannabis plants. EPA has established no restrictions for pesticides used in cannabis production, no tolerances, nor any exemptions from tolerances for allowable pesticide residues on cannabis. As a result, EPA-permitted pesticide labels do not contain allowances for pesticide use in cannabis production. Beyond Pesticides maintains that because of the federal status of cannabis (as a Schedule 1 illegal drug), EPA cannot legally register pesticides for use in the production of the crop. Therefore, the organization asserts, pesticide use on cannabis is illegal.

The lack of federal oversight for cannabis as a crop has states all over the map as they sort through what pesticides, and at what levels, cultivators might be allowed to use. (A snapshot of where states were a few years ago is available here.) State regulations continue to be a crazy quilt of laws and shifting policies that attempt to keep pace with public sentiment, emerging science, and existing health and safety regulations. Currently, 29 states allow some form of medical or recreational cannabis to be sold, each with different pesticide rules. Some have affirmed the prohibition inferred from the federal situation (either with clear prohibitory language or through regulatory silence with an explanatory note on pesticide prohibition), some allow certain toxic pesticide, and some permit pesticides that EPA has determined are exempt from registration.

Some of the legislative scrambling constitutes attempts to define allowed pesticide use and management practices in cannabis production. As Beyond Pesticides executive director Jay Feldman has said, “The use of pesticides in the cultivation of cannabis has health implications for those growing the crop, and for users who are exposed to toxic residues through inhalation, ingestion, and absorption through the skin. [Some] states and DC have adopted rules that require marijuana to be grown with practices that prevent the use of pesticides.” This moment represents an opportunity to restrict all pesticide use at the front end of a growing market and mandate organic management of cannabis — setting a course to protect health and the environment. (The USDA certified organic seal will not be found on marijuana products any time soon because of the federal status of cannabis.)

With more and more states permitting the sale of cannabis for medical and recreational use, governments, growers, retailers, and consumers would do well to consider whether “weed” is harboring unsavory contaminants, including pesticide residues that could be inhaled, ingested, or absorbed. If cannabis is something a consumer plans to ingest, consideration of such contamination ought not to be different than that for a decision to buy produce grown with or without pesticides.

As states struggle to keep pace with this burgeoning industry, some producer groups have taken matters into their own hands. In Colorado, for example, faced with the state Senate’s indefinite postponement of a proposed “Pesticide-Free Marijuana Bill,” and the failure of the Colorado Department of Agriculture to implement meaningful regulations, the Organic Cannabis Association developed a voluntary “pesticide free” certification program for growers. The certification focused on residues on the finished product, so still allowed the use of pesticides not on the narrow list of those restricted by the state. No doubt an attempt to distinguish more-sustainably-grown cannabis from other products in the marketplace, the certification program nevertheless was a step in the right direction for consumers who wish to protect themselves from unwanted pesticides in their cannabis products.

Early in 2018, Canada took the step — in the runup to its July 2018 launch of the recreational market and after discovering that there was significant contamination of cannabis crops by proscribed pesticides — of instituting very hefty fines (up to \$1 million) on growers using the banned compounds. Previously, Health Canada, the country's primary pesticide enforcement agency, had said fines were unlikely because companies knew the banned pesticides were illegal. However, after the country began regular testing, and news outlets began reporting on multiple instances of banned and highly toxic pesticides making their way onto the market, the agency decided to change its approach. Health Canada currently allows some 20 pesticide products for use on cannabis, most of which are biologically based or least-toxic insecticidal soaps.

A few states (Connecticut, Maine, Minnesota, New Hampshire, Massachusetts) and the District of Columbia have adopted regulations that focus on less-toxic approaches to cultivation of medical cannabis, with some focus on ensuring growing practices that avoid or prohibit the use of pesticides. The federal "limbo" provides an important opportunity for states to incentivize the development of a significant industry built on production practices that do not rely on pesticides.

(Beyond Pesticides, June 28, 2018)
<https://beyondpesticides.org/dailynewsblog/2018/05/researchers-delve-role-gut-bacteria-insect-resistance-pesticides/>

PLAN B FOR DICAMBA

Spraying Dicamba? Better Have a Back-Up Plan

Bill Johnson can count the days it might be safe to spray dicamba postemergence this year on one hand.

Along with his colleague, Joe Ikley, the Purdue University weed scientist applied the revised 2018 dicamba label restrictions to weather conditions in west-central Indiana in June 2017.

They found that growers had only two eight-hour days to spray dicamba legally. Smaller one- to five-hour windows were sprinkled throughout the month, for a total of just 44 hours when the label technically allowed spraying in June.

There's no reason to think 2018 will be any different, Johnson warned. "We looked at wind speed data for the last five years, and 2017 was not an anomaly," he said.

Between the federal dicamba label, state restrictions and the usual summer weather, Xtend soybean growers need to be prepared for the possibility that they -- or their commercial applicator -- may not get into the field with dicamba this year.

Weed scientists recommend that growers beef up their pre-herbicide program if time allows, study up on local weed resistance and review their limited additional chemical options before summer begins.

OBSTACLES TO SPRAYING

Let's review the many parts on the 2018 federal labels for Engenia, FeXapan and XtendiMax that will limit applicators' opportunities to spray.

- Wind speeds must be between 3 to 10 mph
- Wind cannot be blowing toward a sensitive crop
- No spraying before sunrise or after sunset
- No rain permitted in the 24-hour forecast
- No temperature inversion can be underway
- Spraying must end at soybean's R2 growth stage
- Weeds should be sprayed at 4 inches or smaller

Don't forget that some states have additional restrictions and cutoff dates, Johnson added. For example, North Dakota limits the dicamba spraying window from one hour after sunrise to one hour before sunset, forbids spraying when air temperatures surpass 85 degrees Fahrenheit and has a cutoff date of June 30. Missouri limits spraying

between 7:30 a.m. and 5:30 p.m. and has cutoff dates that vary by county.

See the various state restrictions here:

--Arkansas:

[https://www.agriculture.arkansas.gov/Websites/aad/files/Content/6223157/FAQ-Dicamba_Regulation_\(Feb_1,2018\).pdf](https://www.agriculture.arkansas.gov/Websites/aad/files/Content/6223157/FAQ-Dicamba_Regulation_(Feb_1,2018).pdf)

--Indiana:

https://www.oisc.purdue.edu/pesticide/pdf/dicambaurp_applicator_mailer.pdf

--Iowa:

<https://www.iowaagriculture.gov/press/2017press/press12282017.asp>

--North Dakota:

<https://www.nd.gov/ndda/news/north-dakota-specific-protocols-announced-dicamba>

--Missouri:

<https://agriculture.mo.gov/plants/pesticides/dicamba-facts.php>

--Minnesota:

<https://www.mda.state.mn.us/chemicals/pesticides/dicamba/dicambafaq.aspx>

--South Dakota: <https://sdda.sd.gov/ag-services/dicamba/default.aspx>

--Tennessee:

<https://www.tn.gov/agriculture/news/2017/12/12/new-requirements-proposed-for-herbicide-use.html>

CHEMICAL OPTIONS

The time has passed for Southern soybean growers to adjust their pre-emergence herbicide program, but some Midwesterners still have time.

"For guys with un-emerged beans, really maximize how much residual herbicide you use, so you do as much damage to the weeds without dicamba as you can," Johnson said.

Once soybeans are up and growing, your postemergence options for control dwindle. Without

dicamba, growers will have to treat RR2 Xtend soybeans like RR2 soybeans.

See this article on residual herbicides to consider after soybean emergence from United Soybean: <https://unitedsoybean.org/article/eight-residual-herbicide-options-to-consider-after-soybean-emergence>

"Go back to the old tank-mix partners or [cultivation]," Johnson said. "Do your homework on other things you can add to the tank."

That means knowing what herbicide resistance your problem weeds may carry. For example, in Indiana, most giant ragweed is resistant to glyphosate and ALS herbicides but will still succumb to PPOs. Waterhemp populations, on the other hand, are resistant to one or more of the following: glyphosate, ALS herbicides and PPO herbicides.

Outside of dicamba -- or glufosinate on Liberty Link soybeans -- there really are no choices for postemergence herbicide-resistant waterhemp control in soybeans, Johnson said. "It's either hand-weeding or cultivation."

Southern growers who miss out on dicamba applications will have the most to fear from waterhemp and Palmer amaranth, said University of Kentucky weed scientist Travis Legleiter.

"The majority of our Palmer amaranth is glyphosate resistant, and we have confirmed PPO resistance, too, which is where things do get a little scary," he said. "In waterhemp, we have glyphosate resistance and -- although we haven't officially confirmed PPO resistance yet -- it's probably close."

CHOP OR PULL

If chemical options are out of the question, and your rows are too narrow for cultivating, have a plan to remove weeds manually from your fields, Johnson said.

"If you're doing it in June, you can simply dislodge the weed and lay it on ground, and hopefully it doesn't rain the next day and re-root," he said.

"If you're doing it late in the year with Palmer and waterhemp, you'll have to carry them out of field" to avoid dropping viable seeds, he added.

See more from Indiana on dicamba restrictions and requirements this year here:

<https://ppp.purdue.edu/private-applicators/educator-resources/>

CEU Meetings

Date: September 18, 2018

Title: 2018 Ensystem CEU Workshop

Location: Hampton Inn & Suites 85th Ave Tulsa OK

Contact: Donald Stetler Jr. (281) 217-2965

www.ceuworkshop.com

CEU's:	Category(s):
2	3A
2	7A
1	7B
1	8
6	10

Date: September 19, 2018

Title: 2018 Ensystem CEU Workshop

Location: Holiday Inn Express Durant OK

Contact: Donald Stetler Jr. (281) 217-2965

www.ceuworkshop.com

CEU's:	Category(s):
2	3A
2	7A
1	7B
1	8
6	10

ODAFF Approved Online CEU Course Links

PestED.com

<https://www.pested.com/>

CEU School

<http://www.ceuschool.org/>

Technical Learning College

<http://www.abctlc.com/>

Green Applicator Training

<http://www.greenapplicator.com/training.asp>

All Star Pro Training

www.allstarce.com

Wood Destroying Organism Inspection Course

www.nachi.org/wdocourse.htm

CTN Educational Services Inc

http://ctnedu.com/oklahoma_applicator_enroll.html

Pest Network

<http://www.pestnetwork.com/>

Univar USA

<http://www.pestweb.com/>

Southwest Farm Press Spray Drift Mgmt

<http://www.pentonag.com/nationalsdm>

SW Farm Press Weed Resistance Mgmt in Cotton

<http://www.pentonag.com/CottonWRM>

Western Farm Press ABC's of MRLs

<http://www.pentonag.com/mrl>

Western Farm Press Biopesticides Effective Use in Pest Management Programs

<http://www.pentonag.com/biopesticides>

Western Farm Press Principles & Efficient Chemigation

<http://www.pentonag.com/Valmont>

For more information and an updated list of CEU meetings, click on this link:

<http://www.oda.state.ok.us/cps-ceu.htm>

ODAFF Test Information

Pesticide applicator test sessions dates and locations for July/August are as follows:

July		August	
2	OKC	6	OKC
12	Tulsa	9	Tulsa
16	OKC	16	Enid
26	Tulsa	20	OKC
		23	Tulsa

Altus: SW Research & Extension Center
16721 US HWY 283

Ardmore: Carter County Extension Office
107 1st Ave Ardmore OK

Enid: Garfield County Extension Office,
316 E. Oxford.

Goodwell: Okla. Panhandle Research &
Extension Center, Rt. 1 Box 86M

Hobart: Kiowa County Extension Center
Courthouse Annex, 302 N. Lincoln

Lawton: Great Plains Coliseum,
920 S. Sheridan Road. Prairie Bldg

McAlester: Kiamichi Tech Center on
Highway 270 W of HWY 69

OKC: ODAFF Building 2800 N Lincoln
BLVD Oklahoma City OK (**New Location**)

Tulsa: NE Campus of Tulsa Community
College, (Apache & Harvard)
Large Auditorium

**Pesticide Safety
Education Program**