

PESTICIDE REPORTS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University

<http://pested.okstate.edu>



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PESTICIDE CERTIFICATION TESTING NOW AVAILABLE IN OKLAHOMA CITY AND TULSA

Pesticide certification exams are now available at PSI test centers in Oklahoma City and Tulsa. PSI is limiting the amount of tests given and following social distance guidelines. Look for the other PSI test locations to become available at a later time.

To make a reservation go to <http://pested.okstate.edu/html/new-odaff-testing-procedure> or the PSI website at <https://candidate.psiexams.com/>

To check for available dates and times at all locations go here. <https://candidate.psiexams.com/testdate/testdate.jsp>

OSU Pesticide Safety Education Program also tweets out available test dates weekly on Twitter [@OkstatePestEd](https://twitter.com/OkstatePestEd). (OSU PSEP)

PRIVATE APPLICATOR TESTING PACKETS AVAILABLE IN RESPONSE TO COVID-19.

ODAFF has once again made the take home Private Applicator test packets available for the short term in response to the COVID-19 emergency. This will still allow an opportunity for producers to acquire a Private Applicator certification to purchase and use Restricted Use Pesticides on their farm or ranch for agriculture production. Private Applicator packets can be purchased from Oklahoma State University Mailing at 405-744-9037 for \$20. Exams must be completed and answers sheets mailed to ODAFF along with a \$20 license fee. A score of 70% must be achieved before the applicator license can be issued. For more information please see the information linked at <http://pested.okstate.edu/> or directly at <http://www.oda.state.ok.us/admin/covid19PrivateApp.pdf> (OSU PSEP)

CONTACTING OSU PESTICIDE SAFETY EDUCATION PROGRAM DURING COVID-19 STATE OF EMERGENCY

Oklahoma State Pesticide Safety Education Program in accordance with the Governors orders for social distancing will now be working from home during the COVID-19 state of emergency. We will still provide help and information on pesticides by phone or email and other electronic options.

If you have questions on pesticide certification. Please email or call:

Kevin Shelton
405-744-1060 kevin.shelton@okstate.edu
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405-744-5808 charles.luper@okstate.edu

For updated information please check our webpage at <http://pested.okstate.edu> or follow us on Twitter [@OkstatePestEd](https://twitter.com/OkstatePestEd). (OSU PSEP)

EPA PROVIDES CRITICAL INFORMATION TO THE AMERICAN PUBLIC ABOUT SAFE DISINFECTANT USE

Today, the U.S. Environmental Protection Agency (EPA) is continuing its efforts to provide critical information on surface disinfectant products that can be used to protect the health of all Americans throughout the COVID-19 public health emergency. In support of these efforts, EPA now has nearly 400 products that have qualified to be effective against SARS-CoV-2, the virus that causes COVID-19. This week the agency also published an [overview](#) of its actions and resources related to disinfection against the novel coronavirus.

“EPA is dedicated to its mission of protecting human health and we want all Americans to have access to effective and approved surface disinfectant products,” said **Alexandra Dapolito Dunn, assistant administrator of EPA’s Office of Chemical Safety and Pollution Prevention**. “We also want everyone follow the directions on the product so that we can safely use registered disinfectants and provide critical protection to our families.”

When using an EPA-registered surface disinfectant, always follow the product’s directions and remember:

- Never apply the product to yourself or others. Do not ingest disinfectant products. This includes never applying any product on [List N](#) (the agency’s list of disinfectants to use against SARS-CoV-2, the virus that causes COVID-19) directly to food.
- Never mix products unless specified in the use directions. Certain combinations of chemicals will create highly toxic acids or gases.
- Wash the surface with soap and water before applying disinfectant products if the label mentions pre-cleaning.

- Follow the contact time listed for your product on [List N](#). This is the amount of time the surface must remain visibly wet to ensure efficacy against the virus. It can sometimes be several minutes.
- Wash your hands after using a disinfectant. This will minimize your exposure to the chemicals in the disinfectant and the pathogen you are trying to kill.

EPA provides additional information on disinfectant safety messages on its twitter feeds, [@EPA](#) and [@EPACChemSafety](#). These channels will be updated with new materials throughout the COVID-19 crisis.

EPA is also continuing to add additional chemicals to its [list of commodity inert ingredients](#). These actions are intended to help address supply chain issues for EPA-registered disinfectants and other pesticides. It allows manufacturers of already-registered EPA products to change the source of listed inert ingredients.

To learn more about disinfectant safety, see this guide from our partner, the National Pesticide Information Center, about using disinfectants to control COVID-19: <http://npic.orst.edu/ingred/ptype/amicrob/covid19.html>

(EPA April 23, 2020)
<https://www.epa.gov/newsreleases/epa-provides-critical-information-american-public-about-safe-disinfectant-use>

DICAMBA LIMITS SOUGHT

On April 28, the Association of American Pesticide Control Officials (AAPCO) sent EPA a letter asking that the agency consider banning postemergence use of four dicamba herbicides -- XtendiMax (Bayer), Engenia (BASF), FeXapan (Corteva) and Tavium (Syngenta) -- when it makes its decision on their

current registrations, set to expire in December 2020.

"Based on application dates of dicamba complaints investigated by the major soybean producing states in 2017 through 2019, prohibiting OTT [over-the-top] applications could greatly reduce dicamba complaint investigations," the letter stated.

The regulatory group also requested EPA make any future registration of these herbicides "conditional on a year-by-year basis."

Leo Reed, an Indiana pesticide regulator who serves as president of AAPCO, said the letter echoes one sent back in 2018 when EPA was mulling its first registration renewal of dicamba herbicides. In that letter, AAPCO asked for an early cut-off date for dicamba use that states could adjust as needed.

"I felt it incumbent upon the organization that EPA be aware of what our position is, and it's not really changed much since 2018," Reed told DTN.

"Although our circumstances have -- we've been hit with hundreds and hundreds more [dicamba] investigations and millions of dollars' worth of expenses conducting those investigations."

Injury complaints skyrocketed in the soybean-heavy states of Indiana and Illinois in 2019. Illinois is investigating an unprecedented 724 cases of alleged off-target injury, and Indiana also set a record with 178 complaints. Other states, such as Arkansas, Kansas, Missouri and Nebraska investigated similar levels of damage in both 2018 and 2019, despite dicamba label changes made by EPA in 2018.

"The money, time and effort that AAPCO and impacted states have expended is unprecedented and not sustainable," the AAPCO letter states. "AAPCO requests that our suggestions be seriously considered as the agency moves forward in making these registration decisions."

Neither applicator training programs nor increasingly restrictive label requirements have proven successful in diminishing off-target dicamba injury, the AAPCO letter added.

"Several attempts by U.S. EPA to refine label use restrictions on the dicamba products beyond the 2017 and 2018 restrictions have not markedly mitigated the incidence of off-target movement in most major soybean producing states," the letter said. "It appears that the U.S. EPA is unwilling or unable to recognize and react to the fact that these products have not been adequately labeled to minimize adverse effects from occurring in most of the nation's top soybean producing states."

As a result, some state regulatory agencies and departments of agriculture have spent millions of dollars and abandoned other duties to attend to an annual parade of off-target injury complaints and investigations, the letter concluded.

"This level of resource drain over the last three years has far exceeded the meager level of enforcement funding provided to impacted state programs through pesticide cooperative agreements," the AAPCO letter said.

Although the dicamba herbicide registrations do not expire until December of this year, EPA has stated that it hopes to issue a decision well in advance of that. Specifically, the agency told state regulators it would like to have all necessary data to make that decision by May 1, Reed said.

AAPCO is also submitting the results of some surveys to EPA, in addition to the letter. One survey polled 29 state pesticide agencies on the number of dicamba investigations they handled in 2019, how they were resolved and what they cost the states. Estimates ranged from the zero to \$2.2 million, with many agencies reporting there was "absolutely no way to calculate" the final cost.

See the survey here:

<https://aapco.files.wordpress.com/...>

AAPCO will soon send an additional survey to EPA, which asked academic weed scientists how much research they lost to off-target dicamba movement in 2019, Reed said.

AAPCO's request to stop post-emergence use of dicamba is not an effort to end the use of dicamba-tolerant technology, Reed said. Rather, it would

allow states to use Section 24(c) special local needs labels to adjust that limit as necessary.

"We believe there is a place for the technology and every state can determine that place," Reed said. "If over-the-top applications are prohibited, then states can design their own 24(c)'s and determine what is the best course. It is impossible for EPA to write a label that is going to be effective across all cropping systems and the entire country."

When AAPCO last submitted a letter to EPA in the summer of 2018 requesting a federal dicamba cut-off date, the suggestion went unheeded in EPA's November 2018 registration renewal of dicamba herbicides.

But Reed is optimistic this letter, and the data EPA has collected on off-target dicamba movement, will be more persuasive this time.

"I feel good about our relationship with EPA, and with the information we are able to provide the agency, I can't imagine there being any other outcome," he said.

See AAPCO's letter to EPA here:

<https://drive.google.com/...>

See a DTN story on AAPCO's 2018 letter on dicamba registrations here:

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

(Progressive Farmer, April 30, 2020)

<https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/04/30/state-regulators-ask-epa-ban-dicamba-2>

NPMA DEBUNKS MISCONCEPTION THAT PESTS CAN TRANSMIT COVID-19

In times of crisis, an overabundance of news, opinions, facts and myths starts to circulate, leading to a heightened level of panic and uncertainty. According to new research, there were over 4 million online conversations in March on the topic of pests and their ability to transmit COVID-19.* Because the gravitas of the current COVID-19 pandemic is already at an apex without the addition of speculation, the National Pest Management Association (NPMA) has set out to dispel at least one misconception about pests and how the disease is being spread.

The amount of information people are receiving right now, whether fact or fiction, is enough to make anyone's head spin," said Jim Fredericks, Ph.D., chief entomologist for the NPMA. "At this time, there is currently no evidence to suggest that pests like mosquitoes and ticks can be implicated in the transmission of COVID-19. They are, however, able to transmit other serious diseases such as West Nile virus and Lyme disease. With summer right around the corner and people spending more time outdoors than ever before, vigilant pest prevention efforts will be paramount to public safety."

To help Americans decipher the true threats associated with pests, NPMA is breaking down the most common culprits of disease transmission and how to protect against them.

Mosquitoes are vectors of numerous diseases, including West Nile virus, Zika virus, Eastern Equine Encephalitis, malaria, yellow fever, dengue, chikungunya and more. Symptoms range from mild to severe, and all can be life-threatening if not treated quickly.

Where they're found: Outdoors, especially near standing water. Even something as small as a bottle cap can support the development of hundreds of biting mosquitoes.

Prevention Tip: Conduct weekly inspections around the property and empty any containers of standing water, as mosquitoes only need half an inch of water to breed.

Ticks such as the blacklegged tick are able to transmit Lyme disease, anaplasmosis and babesiosis. Other tick species such as the American dog tick, Rocky Mountain wood tick and brown dog tick are able to transmit Rocky Mountain spotted fever, which is fatal in 20 percent of cases if not caught early enough.

Where they're found: Overgrown vegetation at tree lines and foot trails through high grass.

Prevention Tip: Keep grass cut low, including around fence lines, sheds, trees, shrubs, swing sets and other difficult-to-cut locations.

Rodents like the common house mouse are able to spread Salmonella, while Norway rats and roof rats are also able to transmit plague, typhus, leptospirosis, rat-bite fever, trichinosis and more. Inhaling dust that contains mouse droppings or urine can exacerbate asthma and allergy symptoms as well, especially in children.

Where they're found: In homes and businesses, rodents are well adapted to live in close association with human activity.

Prevention Tip: Seal all holes larger than a dime and gaps wider than the diameter of a pencil (1/4 inch) to prevent rodents from getting indoors, as mice can fit through holes the size of a dime and rats the size of a quarter.

For more information on public health pests such as mosquitoes, ticks and rodents, visit [PestWorld.org](https://www.pestworld.org)

(PCT Online, April 13, 2020)
<https://www.pctonline.com/article/mosquitoes-ticks-cannot-transmit-covid-19/>

US APPEALS COURT WRESTLES WITH EPA'S DICAMBA REVIEW

The US Court of Appeals for the Ninth Circuit waded back into the debate over the safety of spraying the herbicide, dicamba, on Tuesday (April 21st). It heard oral arguments in a lawsuit brought by environmentalists keen to reverse the EPA's approval of the active ingredient.

The three-judge panel, which heard from the parties via videoconference, largely held off from pointed questioning of either side. But it did voice some scepticism that the EPA had adequately accounted for the environmental harm to non-target crops and taken the necessary steps to safeguard endangered species.

The controversy stretches back to November 2016 when the EPA issued a conditional registration for Bayer legacy company Monsanto's XtendiMax (dicamba + glyphosate) that allowed post-emergence use of the herbicide on genetically modified cotton and soybeans in 34 states. Problems with drift and damage to non-target crops across some 3.6 million acres (1.4 million ha) in the 2017 growing season prompted the EPA to adopt industry-recommended label changes that reclassified XtendiMax – and similar dicamba herbicide – as "restricted use" and impose additional training requirements.

Led by the Center for Food Safety (CFS), a coalition of environmental and farming groups filed suit in early 2017 challenging the original registration, but the Ninth Circuit panel dismissed the lawsuit after the EPA issued a revised registration for XtendiMax in November 2018.

The EPA says that the 2018 registration addressed concerns about off-target movement of the herbicide through additional label changes and mitigation measures, including limits on when the herbicide could be sprayed, restrictions on applications, additional training for applicators and buffers to protect endangered species.

But the plaintiffs were unconvinced and filed a new lawsuit that repeats the claims that the Agency had violated the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Endangered Species Act (ESA). The EPA relied on inconclusive safety data and industry studies that were "deficient in numerous ways and failed to provide it with satisfactory information on dicamba drift in the real world", said CFS staff attorney Sylvia Wu. The Agency also provided "no evidence" that its new mitigation measures would ensure that use of dicamba complied with the FIFRA's standard not to cause "unreasonable adverse effects" on the environment, Ms Wu told the Court.

With regard to the ESA, the Agency used the wrong standard to avoid consultation with the federal wildlife agencies and imposed an "arbitrary" 57-ft (17.4 m) buffer that did little to protect listed species, according to CFS Legal Director George Kimbrell. "This case is not about one landowner applying pesticides in their yard," Mr Kimbrell said. "It is about 100 million acres [40.5 million ha], 34 states, two major crops and an increase of dicamba into the environment of 25 million lbs [11,340 tonnes] a year. EPA originally counted 587 endangered species in the action area, 216 critical habitats and yet it decided [the registration] could have absolutely no effect on any of those species whatsoever."

Complaints and buffers

Arguing for the EPA, Department of Justice (DoJ) attorney Sarah Buckley said that the case "is fundamentally about EPA's application of its scientific expertise to make a judgment call in the face of scientific uncertainty". The EPA fully considered the damage reports from the 2017 and 2018 growing season, Ms Buckley said, and confirmed that the benefits of the new registration outweighed the risks.

But Judge William Fletcher questioned the EPA's claim that the number of complaints about damage to non-target crops from dicamba may have been exaggerated, noting that state officials had said that the complaint numbers were likely too low.

Bar a Monsanto white paper indicating that complaints were overestimated, Ms Buckley was unable to point to any other source for the suggestion. “The only entity saying they are overreporting is Monsanto,” Judge Fletcher said, adding that the record shows “huge amounts” of off-field damage and questioning EPA’s assessment of the risks. “The studies may say one thing ... but the real-world experience is quite to the contrary,” he added.

Judge Margaret McKeown also questioned the EPA’s argument that the revised label was sufficient to address concerns about the possible off-site movement of dicamba. “You are saying the label is designed with such specificity as to make sure there is not misuse,” she said. “But there is a lot of evidence in the record that you can’t follow the label, that as a practical consequence following the label is a non-sequitur.”

On the ESA claims, DoJ attorney J Brett Grosko argued that the Court should defer to the EPA’s expertise and said that the Agency had used “the best available science” to reach its conclusions about the potential harms to listed species and to set a 57-ft buffer.

But Judge Fletcher said that he has “trouble understanding why 57 feet is a magic number” as state officials and landowners have reported dicamba damage on non-target crops at least a quarter of a mile away from treated fields. “We know that a great deal of this dicamba is ending up off the field that has been treated,” Judge Fletcher said, adding that there was “such strong evidence of both spray drift and volatility drift.”

Vacate debate

Monsanto’s attorney Richard Bress suggested that the plaintiffs had missed the legal deadline for filing the case and argued that the Court therefore lacked jurisdiction. But if the court does intervene, Mr Bress said that the judges should resist the call to vacate the registration.

“If this court were to vacate in the middle of planting season it would cause chaos for farmers, but it would also cause great risk to endangered species and the environment,” Mr Bress said, prompting Judge McKeown to ask for a further explanation.

“The risk to endangered species is that farmers would scramble, and many would undoubtedly choose other pesticides to use in the middle of the growing season ... that have not gone through comparable reviews under the ESA,” Mr Bress replied. “They don’t have the same buffer zones, they don’t have the same conditions on use. So we would be trading a pesticide that we know what the effects are for ones where the same level of analysis has never been done. “

Mr Kimbrell closed with a rebuttal of that assessment, telling the Court that there “is absolutely no evidence” that pulling the pesticide from the market would be worse for the environment. (AGROW, April 23, 2020)

WATER QUALITY AFFECTS PESTICIDE PERFORMANCE

Before blaming applicator error or attributing poor pesticide performance to a faulty product, check the water.

“Failed application causes are not always obvious,” says Kim Brown, pesticide safety coordinator at the LSU AgCenter in Alexandria, La.

Brown, speaking at the recent Louisiana Agricultural Technology and Management Conference in Marksville, La., said applicators might blame other factors, maybe weather or pest resistance, for poor control.

“Water can make up more than 95 percent of the spray solution,” she says, “so poor water quality could affect pesticide efficacy.”

Water quality factors that affect pesticides' ability to bind include turbidity, pH, hardness and temperature.

Those factors may reduce solubility and absorption by the target plant and could require retreatment.

Turbidity

Turbidity, Brown explains, is the haziness of a liquid caused by suspended particles. "Suspended positively-charged organic pesticides are attracted to and bind with negatively-charged particles in water. Some products, glyphosate, for instance, bind to suspended sediments, rendering them unavailable for plant uptake."

Brown says pesticide labels may offer warnings such as: "Product performance may be significantly reduced if water containing soil sediment is used as a carrier. Do not mix the product with water from ponds or ditches that is visibly muddy or murky."

"So, clear water should be okay?" she asks. "Maybe, maybe not." The pH makes a difference, too.

"Pesticides are normally formulated as weak acids or neutral to weakly alkaline," she says. "A general rule of thumb: Pesticides perform best in slightly acidic water, pH 4 to 6.5."

She says pH outside the preferred upper or lower range can compromise performance. "In some cases, pesticides will fall out of solution."

She says paraquat is not stable at pH above 7.

Test water pH

She advises testing water pH. A highly accurate test kit, she says, may be as much as \$500. A cheap option, paper test strips, "are good for field testing. A hand-held device runs about \$50 and is fairly reliable."

She says a pH of 5 to 6 is a good target.

Water with a pH of 5 to 8 should be good, then?

Maybe, but dissolved minerals, hard water, could cause trouble, too. "Pesticides bind with those minerals," Brown explains, "and can't enter the target pest."

Again, she recommends testing. "Lab testing is the most accurate and costs \$6 to \$10 per sample. Results are very reliable and should be available in three to five days."

Test kits are available, but Brown recommends users make certain the kits contain everything they need. Paper strips, she says, are cheap, "but not highly accurate."

Water is clear, free of minerals and the pH is well within range, what else could go wrong?
Temperature.

"Water temperature above 102 degrees creates problems," Brown says, "and 40 degrees is too low." She says 72 degrees is a good target.

Big picture

She cautions pesticide applicators not to lose track of "the big picture. Drift, pesticide selection, application timing, etc., remain important concerns."

She says water plays an important role in effective pesticide performance. She offers a check list:

- Sediments can bind up pesticides.
- High pH (above 8) can be harmful to pesticides.
- High mineral content can bind up pesticides.
- Extreme water temperature can affect pesticide performance.

Before looking for something or someone to blame, she cautions, check the water.

(Southwest FarmPress, March 11, 2020)
<https://www.farmprogress.com/crops/water-quality-affects-pesticide-performance>

EPA ADDS NEW SURFACE DISINFECTANT PRODUCTS TO LIST N

On Thursday, the U.S. Environmental Protection Agency (EPA) is continuing its commitment to increasing the availability of surface disinfectants for use against SARS-CoV-2, the novel coronavirus that causes [COVID-19. List N](#): Disinfectants for use against SARS-CoV-2 (List N) now contains over 360 products and has enhanced functionality to allow users to sort these products by surface type and use site. EPA is also continuing to expedite the review process for new disinfectants.

Previously, all products on List N had to have either an [EPA emerging viral pathogen claim](#) or have demonstrated efficacy against another human coronavirus. Now, List N also includes products on [EPA's List G: Products effective against norovirus](#) and [List L: Products effecting against the Ebola virus](#) as these products also meet [EPA's criteria for use against SARS-CoV-2](#).

In addition, EPA has updated List N to include the types of surfaces products can be used on (e.g., hard or soft) and use sites (e.g., hospital, institutional or residential). Products that can be applied via fogging are now noted in the formulation column. This additional information will empower the public to choose products that are appropriate for their specific circumstances.

To help the public better understand List N: Disinfectants for use against SARS-CoV-2, EPA has updated the content on List N and the Frequently Asked Questions about disinfectants related to coronavirus. The FAQ update provides new information on pesticide safety, enforcement, and pesticide devices. It also includes enhanced explanations of why List N products are qualified

for use against SARS-CoV-2 and how these products can be used most effectively.

EPA has continued to adapt its processes to ensure the supply of disinfectants keeps pace with demand. EPA recently announced additional flexibility that allows manufacturers of already-registered EPA disinfectants to obtain certain active and inactive (i.e., inert) ingredients from any source of suppliers without checking with the Agency first. Today, EPA added 48 additional chemicals to its list of commodity inert ingredients. This regulatory flexibility aims to help ease the production and availability of EPA-registered disinfectants.

EPA also is expediting all requests for company numbers and establishment numbers to enable new pesticide-producing establishments to come online as quickly as possible.

For more information on EPA's efforts to address the novel coronavirus visit: www.epa.gov/coronavirus.

(PCT Online, April 3, 2020)
<https://www.pctonline.com/article/epa-disinfectants-covid-19/>

DICAMBA KNOW-HOW

As farmers and applicators head into the 2020 spray season, it is time to brush up on the challenging realities of applying dicamba to Xtend crop fields.

Four dicamba herbicides, XtendiMax (Bayer), Engenia (BASF), FeXapan (Corteva) and Tavium (Syngenta) are available for use over the top of Xtend soybeans and cotton this year.

Here, we have rounded up the latest research and information you need to know before you head to the field with these herbicides.

1. THE FEDERAL LABELS HAVE NUMEROUS RESTRICTIONS

The federal labels for the four new dicamba herbicides are infamously complex. Here are some of the most important restrictions to remember:

-- The herbicides are all restricted use pesticides and can only be handled and sprayed by certified applicators who have completed dicamba-specific training each year.

-- Applications in soybeans are limited to 45 days after planting or up to R1 (V4 for Tavium), whichever comes first.

-- Applications in cotton are limited to 60 days after planting or until mid-bloom, whichever comes first.

-- Applications are limited to one hour after sunrise until two hours before sunset.

-- Ground speeds are limited to 15 miles per hour, boom heights to 24 inches and applications can only be made when wind speeds are between 3 and 10 mph.

-- Applicators must create records within 72 hours of application and record nearly two dozen details listed in the label.

-- Only certain tank mix ingredients are permitted, which are listed on company-specific websites.

-- Growers cannot tank mix products containing ammonium salts, and the label recommends testing all tank mixes to ensure the pH stays above 5 to prevent volatilization.

-- Growers must choose from a handful of pre-approved nozzles and follow a 15-gallon minimum for spray solution volume.

-- Fields in counties with certain endangered species require special buffers.

-- Applicators must maintain a 110-foot to 220-foot downwind buffer, depending on the rates sprayed, and all spraying must cease if the wind is blowing toward "sensitive crops" which are defined briefly on the label.

2. SOME STATES HAVE DIFFERENT RULES

For the third year in a row, applicators must navigate a web of varying state restrictions or additional uses for dicamba herbicides sprayed on Xtend crops. All applicators should check for local and state regulations before they spray this year.

Some states have Section 24(c) Special Local Needs labels issued for XtendiMax, Engenia, FeXapan and Tavium, and the state of Arkansas has its own state regulation banning use of those herbicides after May 25.

The 24(c) restrictions range from additional training to cutoff dates on dicamba applications. States with cutoff dates include:

-- Illinois: June 20 cutoff date and a temperature cutoff of 85 degrees.

-- Indiana: June 20 cutoff date.

-- Minnesota: June 20 cutoff date.

-- North Dakota: June 30 cutoff date.

-- South Dakota: June 30 cutoff date.

Some states, such as Oklahoma and Texas, have expanded dicamba use beyond the federal label for 2020. Specifically, Oklahoma has extended the dicamba-application window to 60 days after

soybean planting and 90 days after cotton planting, and Texas has also pushed its cotton application window to 90 days post-planting. Oklahoma and Texas also allow spraying at all times of day, sunrise to sunset, as long as no temperature inversion is underway.

3. VOLATILITY RISK FACTORS ARE NUMEROUS

There is growing consensus among academic and Extension scientists that the new dicamba herbicides are prone to volatilizing and moving off target, especially when certain factors are at hand.

-- Glyphosate: Weed scientists in Arkansas, Indiana and Tennessee have found that glyphosate added to dicamba often drops the pH of the spray tank mix below 5, which can lead to increased volatility. As a result, some weed scientists are recommending growers make separate dicamba and glyphosate applications.

-- Temperature: Recent humidome data from University of Tennessee weed scientist Tom Mueller showed that dicamba volatility increased steadily as temperatures rose above 68 degrees.

-- Green Fields: Mueller's recent field studies have also shown that when dicamba is applied to fields with green, actively growing plants -- such as weeds or crops -- volatility increases.

--Soil pH: In 2019, University of Missouri weed scientist Mandy Bish collected details from fields where dicamba applications had stayed on target and from fields where it had moved off target with no apparent label violation. She compared soil types, topography and weather whenever possible, and -- after additional research by her university colleagues -- found that the higher the pH of a field's soil surface, the more likely the dicamba application stayed put. Lower soil pH increased the likelihood it would volatilize and move off target.

-- Proximity to Water: Another potential risk factor identified by the Missouri study was proximity to bodies of water, such as rivers and lakes, though researchers have yet to study that further, Bish said.

4. TEMPERATURE INVERSIONS ARE FREQUENT AND DANGEROUS

A temperature inversion occurs when a cool air mass -- and any potential herbicide particles in it -- become trapped near the ground for hours until the air warms and disperses. University of Missouri scientists have detected three times as much dicamba in the air following an application made during an inversion compared to on-label applications.

Bish and her colleagues at the University of Missouri have now spent five years tracking temperature inversions across the state and recently distributed their inversion detection weather stations to seven other states: Arkansas, Indiana, Illinois, Kentucky, Louisiana, Mississippi and Tennessee.

Overall, they have found that inversions occur frequently in the spring and summer months, usually setting up in the afternoon and evening hours, sometimes even earlier than two hours before sunset, Bish noted.

"What we've found is that, on a typical June evening, you would have more than 50% chance of having an inversion set up in the geographies we've studied," she said.

Data from the Tennessee weather stations has shown that inversions can also be extremely local -- setting up in one field up to 90 minutes before emerging in a field only one mile away, Bish added. That means it's risky to rely solely on inversion-forecasting apps or weather readings that use data from beyond your own field, she noted.

Applicators' best bet is to survey the field they are spraying carefully, with an eye for risky conditions, such as clear skies, little-to-no wind and low-hanging dust or fog. Low-lying fields and fields where tree lines block southerly winds can also see some of the most intense inversions, Bish added.

See more from the University of Missouri here: <https://weedsociology.missouri.edu/...> and DTN here: <https://www.dtnpf.com/...>

5. HERBICIDE ANTAGONISM IS A KNOWN PROBLEM

As a recent DTN article noted, dicamba can antagonize certain grass herbicides such as glyphosate and clethodim in a tank mix.

Although the exact mechanism isn't known, dicamba inhibits the plant's metabolism of the glyphosate or clethodim, allowing grassy weeds to survive the application. In Tennessee, this effect was very visible and led to problems with barnyardgrass and junglerice control in 2019. University of Tennessee Extension weed scientist Larry Steckel is recommending that growers make separate applications of grass herbicides and dicamba for better weed control.

See the DTN article here: <https://www.dtnpf.com/...> and Steckel's reports on this problem here: <https://news.utcrops.com/...>

6. DRIFT MITIGATION CAN WORSEN WEED CONTROL

In an effort to limit physical drift of dicamba, labels of the new herbicides require a host of drift-reducing requirements. They include specific nozzles and droplet sizes, as well as approved drift-reduction agents (DRAs) that can be added to a dicamba tank mix.

Keep in mind that these drift-mitigation tactics are not going to improve the efficacy of your dicamba applications and may actually decrease it, Purdue University weed scientist Bryan Young cautioned in a recent webinar.

The drift-reduction agents approved for use with dicamba herbicides are designed to thicken spray solutions, which helps reduce very tiny, driftable spray droplets. Nozzles required for use with dicamba herbicides, such as the TTI nozzles, are also designed to produce larger, ultra-coarse droplets less likely to move off target.

But there is plenty of university research, including Young's, showing that these larger droplets also result in less spray coverage and reduced weed control. Because these nozzles and ultra-coarse droplets are legal requirements for dicamba herbicides, this is "a potential sacrifice we will have to learn to live with," Young warned.

The full webinar, which is part of a series on herbicide resistance from the industry group, Take Action, will be posted here: <http://iwilltakeaction.com/...>

7. DICAMBA RESISTANCE IS A GROWING THREAT

With the rapid ramp-up of Xtend acreage and dicamba applications across the Midwest and South, weed scientists are starting to document a rise in weeds surviving these herbicide applications.

Given dicamba's long history of use in pasture and no-till corn and wheat systems, resistance already exists in some Palmer amaranth and kochia populations in Kansas. See more here: <https://www.dtnpf.com/...> and here: <https://webapp.agron.ksu.edu/...>

Most recently, weed scientists in Tennessee and Arkansas have confirmed that some Palmer

amaranth populations from Tennessee are surviving labeled rates of dicamba, most likely as a result of Tennessee's high adoption rate of Xtend crops for the past three years. (See the DTN story here: <https://www.dtnpf.com/...>).

Weed scientists in Indiana and Missouri are testing other weeds, including marestail and waterhemp, for dicamba efficacy as well.

(Progressive Farmer, March 12, 2020)
<https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/03/12/inspector-general-open-dicamba-24c>

CEU Meetings

None Available

ODAFF Approved Online CEU Course Links

Online Pest Control Courses

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

PestED.com

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

Certified Training Institute

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

WSU URBAN IPM AND PESTICIDE SAFETY EDUCATION PROGRAM

<https://pep.wsu.edu/rct/recertonline/>

CEU University

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

Technical Learning College

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

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/>

AG CEU Online

<https://agceuonline.com/courses/state/37>

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

<http://www.kellysolutions.com/OK/applicators/courses/searchCourseTitle.asp>

NEW ODAFF Test Information

Testing dates and locations may be limited due to the Covid-19 emergency.

New computerized testing began October 1, 2019. Testing will be done at testing centers in multiple locations around the state by PSI Services LLC.

For more information and instructions please go to <http://pested.okstate.edu/html/new-odaff-testing-procedure> or the PSI exam information website www.psiexams.com/.

Reservation must be made in advance at www.psiexams.com/ or call (800) 733-9267

PSI locations.

Oklahoma City I 3800 N Classen Blvd, Ste C-20, Oklahoma City, OK 73118

Oklahoma City II NW 23rd St and Villa Avenue, Suite 60, Shepherd Mall Office Complex, Oklahoma City, OK 73107

Tulsa 2816 East 51st Street, Suite 101, Tulsa, OK 74105

McAlester 21 East Carl Albert Parkway (US Hwy 270), McAlester, Oklahoma 74501

Woodward 1915 Oklahoma Ave, Suite 3, Woodward, OK 73801

Lawton Great Plains Technology Center, 4500 West Lee Blvd Building 300- RM 308, Lawton, OK 73505

Enid Autry Technology Center, 1201 W. Willow Rd, Enid, OK 73703

Ponca City Pioneer Technology Center, 2101 N Ash, Ponca City, OK 74601

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