

# PESTICIDE REPORTS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University

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CHEM

- 1 THREE DATES SET FOR FALL UNWANTED PESTICIDE DISPOSALS
- 2 PRIVATE APPLICATORS CAN NOW START TESTING AT PSI TEST CENTERS
- 2 EPA ANNOUNCES THE IMPLEMENTATION OF MITIGATION MEASURES FOR INSECTICIDE MALATHION TO PROTECT ENDANGERED SPECIES
- 4 EPA PUBLISHES UPDATED RISK ASSESSMENTS FOR CHEMICAL ACEPHATE
- 5 WHAT TO DO BEFORE MAKING A SPRAY DRONE PESTICIDE APPLICATION
- 7 SHIPPING CONTAINER FUMIGATED FOLLOWING FST DISCOVERY IN CALIFORNIA
- 8 HERBICIDES CAN BIND TO RICH SOILS
- 9 N.C. STATE STUDY: COMMON VETERINARY DRUGS SHOW EFFECTIVENESS AGAINST BED BUGS
- 10 CDC WARNS OF EMERGING TICK BITE-ASSOCIATED MEAT ALLERGY
- 12 CEU MEETINGS
- 12 ONLINE CEU LINKS
- 13 ODAFF TEST INFORMATION

## THREE DATES SET FOR FALL UNWANTED PESTICIDE DISPOSALS

ODAFF has scheduled the next Unwanted Pesticide Disposal Program collection dates for October 2023. They will occur October 17 in Walters, October 18 in Buffalo, and October 19 in Dewey.

The locations are the Cotton County Fair & Expo Center, Harper County Fairgrounds, and the Washington County Fairgrounds. The Disposals will run from 8 a.m. to 1 p.m. rain or shine at both locations.

There is no charge for this program. **Limit is 2,000 pounds per entity.** ONLY PESTICIDES will be taken at the sites (no fertilizer, paint, oil, etc)! If you have any questions, contact Charles Luper (OSU) at 405-744-5808 or Ryan Williams (ODAFF) at 405-522-5993.

October 17 Cotton County Fair & Expo Center  
924 West Missouri Avenue, Walters, OK

October 18 Harper County Fairgrounds  
1230 N 190 Rd, Buffalo, OK

October 19 Washington County Fairgrounds  
1109 N Delaware St. Dewey, OK

For more information please go to <https://extension.okstate.edu/programs/pesticide-safety-education/unwanted-pesticide-disposal-program/index.html>(OSU PSEP)

## **PRIVATE APPLICATORS CAN NOW START TESTING AT PSI TEST CENTERS**

Private Applicators that need to take the Private Applicator Exam to renew their certification before the December 31 expiration date may now do so at PSI test centers around the state.

Private Applicators should have received a notice from the Oklahoma Department of Agriculture Food and Forestry (ODAFF) if testing is needed.

All applicator testing is given at PSI test centers in the state. Private applicators must take a 50 questions closed book test at the PSI test centers.

Testing fees are \$65 per exam for Private Applicators. Once passed, ODAFF emails Private Applicator certification cards to the applicator. Private applicator certifications renewed will be good through December 31, 2028.

Find more information and links to the PSI test centers at <https://extension.okstate.edu/programs/pesticide-safety-education/odaff-pesticide-applicator-testing-procedure/>. (OSU PSEP August 1, 2023)

## **EPA ANNOUNCES THE IMPLEMENTATION OF MITIGATION MEASURES FOR INSECTICIDE MALATHION TO PROTECT ENDANGERED SPECIES**

The U.S. Environmental Protection Agency (EPA) is taking action to protect endangered and threatened species by implementing the U.S. Fish and Wildlife Service's (FWS) nationwide final biological opinion (BiOp) for the insecticide malathion. The malathion BiOp is the first nationwide BiOp issued by FWS to cover all registered uses of a pesticide across the United States and its territories. Its implementation represents the final stage in the Endangered Species Act (ESA) consultation for malathion and is the culmination of a collaborative process over more than seven years involving EPA, FWS, the U.S. Department of Agriculture, pesticide registrants and other stakeholders. Today, EPA is implementing this BiOp by issuing Endangered Species Protection Bulletins, available on the Bulletins Live! Two website and approving malathion label amendments to incorporate measures to protect listed species.

Malathion is an organophosphate insecticide commonly used to control foliage and soil insect pests. It is used in the agricultural production of a wide variety of food and feed crops to control many types of insects such as aphids, leafhoppers, and Japanese beetles, as well as by home gardeners for outdoor residential uses including vegetable gardens, fruit trees, and a variety of ornamentals. Malathion-containing pesticide products also have significant public health benefits when used in pest control programs for controlling mosquito-borne illnesses. Malathion was one of the initial pilots chosen by EPA to help develop ESA consultation processes for FIFRA actions and to incorporate recommendations from the [National Academy of Sciences](#). Malathion was the subject of litigation,

and the timing associated with EPA’s consultation was dictated by that litigation.

Under the ESA, EPA is responsible for ensuring that its actions—including many pesticide registration actions—do not jeopardize listed species or destroy or adversely modify their designated critical habitats. EPA completes a biological evaluation (BE) to assess the risk of a pesticide to listed species. In January 2017, EPA released the BE for malathion, which determined—given malathion’s large number of labeled uses—that the registered uses of malathion have the potential to adversely affect one or more individuals of most (>90%) federally threatened or endangered (listed) species. In its BE, EPA determines if an individual of a species may be affected or not. If EPA determines that a species may be affected, then EPA uses additional information to determine if pesticide is Not Likely to Adversely Affect (NLAA) or is Likely to Adversely Affect (LAA) an individual of a species or critical habitat. If EPA makes a LAA determination, as it did with malathion for many listed species, EPA must engage in formal consultation with the Services. Practically, the LAA threshold for a BE is very conservative as the likely “take” of even one individual of a species triggers LAA (even if that species is almost recovered).

The Service(s) then may develop a BiOp that, among other things, determines whether the pesticide is expected to jeopardize listed species or destroy or adversely modify critical habitat, and if so, requires measures to protect these listed species and critical habitats. Such measures are identified through the consultation process, which involves EPA, the Services, USDA, the pesticide applicants, and other stakeholders.

FWS’s draft BiOp for malathion identified 78 listed species that could be jeopardized by how malathion was used before the consultation process. The final BiOp specifies agreed-upon mitigation measures including no spray zones, reductions in application

rates and number of applications, and other changes to the labels that, once implemented, avoid jeopardy and adverse modification of critical habitat. Registrants involved in the consultation agreed to implement these measures by modifying their product labels, which now contain directions on how to apply the pesticide in accordance with the FWS BiOp.

Additionally, mitigation measures that are only applicable near a species’ habitat are available on EPA’s [Bulletins Live! Two](#) website, an online system that describes geographically specific pesticide use limitations to protect listed species and their designated critical habitats.

FWS determined that the new mitigation measures, once implemented, will adequately reduce the potential effects of malathion products on listed species. These measures will not only protect listed species but also reduce exposure and ecological effects more broadly wherever malathion is used.

After consultations between the EPA, NMFS, FWS, and the malathion registrants and with input from USDA, the FWS and NMFS issued “no jeopardy” BiOps that were finalized on February 28, 2022, and June 30, 2022, respectively. The Services came to a “no jeopardy” determination based on mitigation measures that were identified during the consultation process.

EPA is also working to implement the National Marine Fisheries Service’s nationwide final BiOp for malathion, chlorpyrifos and diazinon by the BiOp implementation date of December 30, 2023. The newly approved amended malathion labels include changes necessary to comply with both BiOps, but only the FWS Bulletins are currently available in Bulletins Live! Two. Registrants have submitted requests to amend their product labeling to include the necessary mitigation measures to address spray drift and runoff, as well as guidance on how to report ecological incidents associated with pesticide applications, should users observe

any. EPA reviewed these amendments and approved the amended labeling.

For additional information on the FWS BiOp and the NMFS BiOp for malathion, visit [EPA's website](#). The [registration review process](#) for malathion is ongoing, with the Proposed Interim Decision, proposing any additional necessary mitigations for comment, expected to be completed by the end of this year.

(EPA, August 23, 2023)

<https://www.epa.gov/pesticides/epa-announces-implementation-mitigation-measures-insecticide-malathion-protect>

## EPA PUBLISHES UPDATED RISK ASSESSMENTS FOR CHEMICAL ACEPHATE

Today, the U.S. Environmental Protection Agency (EPA) released a [revised human health draft risk assessment \(HH DRA\)](#) and [refined drinking water assessment \(DWA\)](#) for acephate, an organophosphate pesticide (OP) that is registered for both agricultural and non-agricultural uses. The acephate HH DRA includes an assessment of methamidophos, which is also an OP compound that is formed when acephate is metabolized.

The revised HH DRA showed significant dietary risks of concern from drinking water for registered uses of acephate, including non-agricultural uses. EPA also identified dietary risks of concern when only the two highest agricultural usage sites (measured by pounds sold), cotton and soybean, are considered.

The revised HH DRA includes additional information on dietary risk, as well as risk identified for occupational handlers and post-application scenarios, non-occupational bystanders, and residential exposures. The revised HH DRA reflects numerous updates since the previous risk assessment, including reevaluation of the Food Quality Protection Act safety factor (FQPA SF), which is intended to provide an additional 10X margin

of safety to account for any additional risk to pregnant women and children, but which can be reduced or removed if a scientific determination is made that no such additional risk exists.

The document entitled [Approach for Evaluating Developmental Neurotoxicity Potential for the Organophosphate Pesticides](#) outlines EPA's decision to evaluate the developmental neurotoxicity (DNT) potential of OPs to pregnant women and children on a chemical-by-chemical basis using high quality, chemical-specific data from three primary lines of evidence – epidemiological studies, animal toxicity studies, and a battery of *in vitro* assays. These data are then used to evaluate DNT potential using a weight of evidence (WOE) approach, which is a process that integrates all relevant evidence to support decision-making that allows for consideration of strengths and limitations of each line of evidence.

Applying the principles described in the document referenced above to acephate, EPA updated the FQPA SF determination to include the WOE analysis for DNT potential to pregnant women and children using chemical-specific data for acephate and methamidophos. This WOE analysis can be found in the document entitled [Evaluation of the Developmental Neurotoxicity Potential of Acephate/Methamidophos to Inform the FQPA Safety Factor](#).

Taking the WOE evaluation for DNT potential into account, although acephate and methamidophos are known neurotoxicants (i.e., chemicals that disrupt normal activity of the nervous system), there is little to no evidence that acephate or methamidophos are developmental neurotoxicants (i.e., chemicals that impact the normal development of the nervous system during pregnancy or childhood). Therefore, there is no additional risk when exposures of acephate or methamidophos occur to pregnant women or children. Changes in acetylcholinesterase (which causes a neurotoxic effect, not a developmental neurotoxic effect) continues to be the most sensitive and health-protective endpoint for the acephate human health risk assessment. As a result, EPA concluded there is reliable chemical-specific data to support reducing the acephate FQPA factor to 1x.

The Agency is still assessing the benefits and alternatives of acephate through the ongoing registration review process. These assessments, as well as the revised HH DRA and refined DWA, will inform the acephate proposed interim decision (PID), which is expected to be completed sometime next year. With the availability of these documents, the Agency will be reaching out to acephate registrants to discuss the human health risks identified in the revised HH DRA and the ecological risks that were previously identified in the [March 2017 ecological risk assessment](#). Earlier this year, the Agency received information from the Department of Agriculture on the importance and benefits for the use of acephate on crops and non-agricultural applications. A public comment period will be open following the publication of the PID, and stakeholders may also comment on the revised HH DRA and refined DWA at that time.

Acephate is one of 18 OPs currently in registration review, with many scheduled to have interim decisions between 2024-2026. For more information on the registration review of acephate, including the HH DRA, DWA, and supporting documents, please visit the acephate docket on [regulations.gov](https://www.epa.gov/regulations.gov) under Docket ID [EPA-HQ-OPP-2008-0915](#). (EPA, August 30, 2023) <https://www.epa.gov/pesticides/epa-publishes-updated-risk-assessments-chemical-acephate>

## WHAT TO DO BEFORE MAKING A SPRAY DRONE PESTICIDE APPLICATION

With increased availability and interest in spray drones recently, we are starting to see more people getting into the spray drone application business as well as growers who are interested to learn more about the technology and its application capabilities.

The wet weather during months of May and June across much of the Southeast also made most fields inaccessible with ground application equipment, hence limiting the timely pesticide applications for most growers. Consequently, there have been lot of questions

lately about use of spray drones for pesticide applications in both row and specialty crops.

While multiple research efforts are underway and it will take some time to completely understand the spray performance and efficacy of pesticides applied with spray drones, we have learned some things from our work that can serve as some general application considerations and helpful for those interested in using spray drones for pesticide applications:

- First and foremost, it is important to understand that the rules and regulations for using spray drones for pesticide applications are very different and complex than flying a normal drone with a camera. Make sure you are aware about all the FAA regulations for pesticide applications with spray drones and have all the required licenses and certifications in place. Detailed information on these regulations can be [found here](#).
- Regarding labels, at this time if a pesticide has been approved for an aerial application, it can be applied with a spray drone following the similar application i.e., spray volume, droplet size and other drift management requirements listed on the label. Changes to pesticide labels for aerial applications with spray drones are expected in the future.
- For most pesticide labels, remember that the minimum spray volume requirement for aerial application is 2 GPA (check label carefully, this can be higher like 5 or even 10 GPA for some pesticides). Do not use spray volumes below the minimum recommended or 2 GPA as it can considerably affect the coverage and pesticide efficacy, and it can also create compatibility issues during mixing. In fact, we have seen significant improvement in both coverage and efficacy in some cases by increasing the spray volume to 3 GPA.
- Currently, most new spray drones come equipped with standard XR flat-fan nozzles (except if it has rotary atomizers) which are not really the best choice for spray drift management and even coverage for aerial applications. Use a nozzle that provides medium to coarser spray droplets (e.g. AIXR or AirMix) to minimize

spray drift potential as well as attain good coverage on the crop or within the canopy. XR nozzles should only be used in calm conditions with wind less than 4-5 MPH.

- For spray drones with rotary atomizers such as DJI T40, there is an option to select the droplet size from the controller screen so again make sure to use the medium to coarser droplet sizes as 250 to 320  $\mu\text{m}$  spray droplets is a good range for most pesticide applications.
- Drone height from the ground or crop canopy is directly related to the spray swath but also only up to a certain height. Determine an optimal height range for your drone, such as 8 to 12 ft for DJI T30, and stay within that range for adequate application performance. Do not fly too low or too high to avoid streaking or causing any unnecessary drift that could be avoided. Also remember that flying above a certain height (e.g. 12 ft) does not increase swath anymore but instead considerably increases the potential for spray drift.
- Most newer spray drones are equipped with a rate controller which means that it will adjust the flow rate (gallons per minute, GPM) accordingly based on the selected speed and swath to attain the target application rate (in GPA) but within the pump and spraying systems' capacity. Therefore, do not always utilize the maximum swath and maximum speed options for applications as the performance of the spray system is mostly sub-par at its full capacity. The potential for spray drift and vortex is also increased at higher speeds.
- Before any pesticide applications with your spray drone, it is highly recommended to perform some sort of swath testing using spray cards or a continuous sheet of paper to determine effective swath using the intended application parameters i.e. height, speed and nozzle type/droplet size. This is very important to understand the spray performance (coverage) of the drone and to adjust swath accordingly to avoid any major application issues.
- The general best management practices for pesticide applications applies to the spray drones too so make sure to follow them accordingly. Some of these include avoid spraying when wind speeds are more than 10 mph, considering

wind direction to minimize spray drift, and avoiding applications when conditions for temperature inversions are favorable or if sensitive crops are downwind.

- None of the spray drones available today have any sort of agitation in the solution tank so make sure to be careful about using any pesticides that need to stay suspended in the solution or using tank-mixes that can possibly seize the pump or clog the nozzles. If planning to use two or more pesticides, make sure to properly check the tank-mix compatibility of the products using a jar test or other similar method. Tank mix compatibility test is very important for low GPA applications (2-3 GPA). A jar test should be performed when a new tank mix is used. Considering spray drones do not have tank agitation, the tank mix in jar test should be able to maintain homogeneity for at least 8-10 minutes without showing layer separation and precipitation.
- Always use drift reducing adjuvants (DRAs) to improve coverage and also reduce spray drift. Some DRAs can cause foaming and tank incompatibility if they have oil-based formulation. Jar test for compatibility is required when tank mixing a new DRA.
- Before creating and implementing a flight plan, inspect the field properly for any obstacles or any other operational considerations that will require the drone to stop or veer from the planned flight route. In most cases, using only background maps (aerial/satellite imagery) is not reliable enough to avoid all possible obstacles in the field so in-field checks before take-off are must for safe operations and to avoid any damage to the spray drone.
- Loss of signal between the drone and remote controller is common when flying large fields or tall crops like corn and creates significant crash risks for the operators. Utilizing signal transmitters like DJI relay can reduce the risk of drone losing the connection with the controller in these situations where the drone is out of sight. It is also important to set up the base on high ground so the drone is in the visual line of sight as much as possible during application.
- When planning to spray large acres, think about re-filling and charging station to minimize downtime and be efficient with the application.

A portable trailer setup with re-filling and charging stations onboard seems to be the most common practice currently utilized by spray drone operators, but this can vary from one operation to another and also based on many factors such as number of batteries, generator capacity, size and type of the fields to be sprayed.

- Given the costs of newer spray drones (\$30,000 – 50,000) which will likely increase in the future with larger tanks and more features, consider buying drone insurance especially if planning to operate as a commercial spray drone business. This is also a good option for growers and operators planning to use them for pesticide applications on their own farms.

(FarmProgress, July 27, 2023)

<https://www.farmprogress.com/technology/what-to-know-before-making-a-spray-drone-pesticide-application>

## SHIPPING CONTAINER FUMIGATED FOLLOWING FST DISCOVERY IN CALIFORNIA

A shipping container originating from China that had made its way to Eastvale, Calif. (after docking in the San Pedro port) was fumigated Aug. 17, following the discovery of Formosan subterranean termites (FSTs).

The initial discovery was made by Matt Cromwell, technical account manager at [Ecolab Pest Elimination](#), Los Angeles, who alerted Lee Whitmore, president of Anaheim, Calif.-based [Quality Pest Services](#) (which Ecolab subcontracts with for fumigation work). Whitmore recognized that the soldiers looked “abnormal” and that they might be FSTs. He sent photos to Dr. Chow-Yang Lee, professor at the [University of California, Riverside](#), and Matt Fabry, business development manager at Douglas Products, manufacturer of Vikane gas fumigant.

Lee and his team, along with Cromwell, Whitmore and Fabry, visited the site on Aug. 14, and brought back

samples to the UCR lab, where Lee confirmed they were Formosan subterranean termites.

The group decided fumigation was the best treatment strategy. “Because Dr. Lee did establish that they were for Formosan subterranean termites and because the container did not have any ground-to-soil contact, we knew that the colony was completely isolated to the container. And that is what made fumigation the correct treatment to eliminate the colony,” Fabry said.

Whitmore and his team fumigated the container – a standard 40-foot, 2,700 cubic feet shipping container – on Aug. 17. “It was a pretty standard fumigation, but we offloaded hundreds of boxes of snow boots to allow us to visually inspect the entire container and assess whether there were any signs of alates and to allow for better circulation of the fumigant,” Whitmore said.

Whitmore said the application was done at four times the standard drywood termite application rate and held for two days longer than what was required. “We conducted a visual inspection upon completion of the aeration and all the termites were dead,” he said.

Lee added that “fortunately no swarmers were found” and that the group would not be visiting the original port of entry (San Pedro) to inspect for more FSTs as that would be like “trying to find a needle in a haystack” and they don’t know where the container sat at the port when it was there.

(PCT Online, August 31, 2023)

<https://www.pctonline.com/news/formosan-termite-discovery-california-fumigation/>

## HERBICIDES CAN BIND TO RICH SOILS

The North Carolina Blacklands, with its rich, dark soil high in organic matter, presents unique challenges that farmers in other parts of the Southeast often don't have to deal with when it comes to fighting weeds.

One challenge that Blackland farmers need to be on top of is the fact herbicides used in the Blacklands can often bind to that type of soil and therefore not be available for weed control. Charlie Cahoon, [North Carolina State University Extension Weed Specialist](#) for corn and cotton, said this is especially true for residual herbicides.

Cahoon said the reason such products as Prowl or Treflan aren't used on high organic soils is that they have really high  $K_{OC}$ s, or adsorption coefficients, that is included for most herbicides. The  $K_{OC}$  represents how strongly an herbicide adsorbs to the soil when normalized for the amount of organic matter in soil.  $K_{OC}$  values less than 300 indicate a high potential for leaching.

"Herbicides have an affinity or don't have the affinity to bind to soil. Some are more tightly absorbed to soil. Your soil has exchange sites on it, and that's how it holds nutrients. When you put calcium and magnesium out there liming it, those are held onto the soil and can be released later on if the plants need it. The same thing can happen with herbicides. The problem with that is if that herbicide is bound to your soil it is not available for weed control," Cahoon said at the Blackland Farm Managers Tour Aug. 2 at Middle Creek Farms in Engelhard.

### Group 15 herbicides

Cahoon did say that Group 15 herbicides do offer some weed control and can be used in the Blacklands. Group 15 includes such products as Dual, Warrant, Outlook, and Zidua. Cahoon noted that Group 15 herbicides have a relatively low to moderate  $K_{OC}$  and have a potential fit in the high organic soil of the North Carolina Blacklands.

Cahoon explained that the lower the  $K_{OC}$  of a herbicide, the less affinity it has for being absorbed by the soil colloids, which means they should work better on high organic soils compared to herbicides with a higher  $K_{OC}$ . For example, Cahoon said the herbicide Harness contains the active ingredient acetochlor which has an average  $K_{OC}$  of 1.5, a fairly low number.

"If you call me in this neck of the woods for a recommendation for Group 15s, I have steered you toward acetochlor. That's not because I'm trying to sell Harness. It's because science says it should work better on these higher organic soils," Cahoon said.

Cahoon did point out that some herbicide labels restrict use where soil organic matter is greater than 10% because the herbicides will tightly bind to soil organic matter. He urged Blackland farmers to read the label to determine if an herbicide can be used in high organic soils and then take that into consideration when choosing products, especially residual herbicides.

At the Blackland field day held in Hyde County, Cahoon rang warning bells on doveweed and field pansy, two weeds that are becoming more of a worry in the Blacklands. He urged the use of Group 15 herbicides for doveweed in the Blacklands, due to the soil binding challenge.

"Doveweed is particularly problematic here in Hyde County, but it's starting to move west. I'm getting more and more calls from places outside of Hyde County having problems with doveweed. The main reason why is people spray Roundup on it two or three times, and they don't kill it. It is not easily controlled with Roundup," Cahoon said.

### Doveweed control in corn

For corn, Cahoon said the best way to control doveweed is to use post-emergent herbicides. He said the only control options in corn are atrazine and Evik. Dicamba and 2,4-D are not a post-emergent option for doveweed control in corn.

"We really don't have that many good post-emergent options. In my opinion, that's not where we should focus our attention on doveweed anyway. We really need to



attack doveweed from the residual standpoint, and the thing about doveweed that folks may not understand is that it's one of our late emerging species. Some weed species come up early, some come up late, and doveweed is one that comes up late," Cahoon explained.

Cahoon said this means that a residual applied in April won't work on doveweed because it typically doesn't start coming until late June. The residual won't be available in June to control the doveweed. That's why it is important to target your residual controls for doveweed in early to mid-June, just ahead of the emergence of the weed.

Cahoon said the residual options for doveweed control are Group 15 herbicides, Warrant, Dual, Outlook, and Zidua. Thankfully they work on a range of soil types including the high organic land where we typically have more of an issue with doveweed. So that's a good option. But remember the timing part of it is more important."

### **Soybeans vs. doveweed**

If a farmer has a really bad doveweed problem, Cahoon advises them to plant soybeans instead of corn.

"We have a really good post-emergent option in soybeans. And that is FirstRate. FirstRate works really well and is one of the best products we have for controlling doveweed, so if you've got a problematic farm, rotate to soybeans, use a residual. FirstRate is really going to be the ticket for getting rid of that doveweed," Cahoon said.

Field Pansy is another weed that is popping up in the Blacklands, particularly in no-till production systems. Cahoon said farmers who have issues with field pansy say it is a nightmare to plant through because it can often get as big as a basketball.

"It is another one that Roundup does not work very well on. Dicamba and 2,4-D don't work well on it at all. Our standard has been Gramoxone, but not Gramoxone by itself. We really needed Gramoxone plus atrazine or Gramoxone plus metribuzin or Gramoxone plus Diuron. We need something to heat that Gramoxone up," Cahoon said. Outside of Gramoxone tank mixes,

Cahoon's research suggest newer PPO-herbicides, like Sharpen and Reviton, combined with high rates of Roundup (> 1.125 lb acid equivalent per acre) plus MSO and AMS may have a fit for fall or early spring applications targeting field pansy.

(FarmProgress, August 21, 2023)

<https://www.farmprogress.com/crop-protection/herbicides-can-bind-to-blacklands-soils-what-can-you-do->

## **N.C. STATE STUDY: COMMON VETERINARY DRUGS SHOW EFFECTIVENESS AGAINST BED BUGS**

Two common drugs used by veterinarians to combat parasites may be effective against bed bugs, with one showing especially strong potential, according to a [study](#) from North Carolina State University that examined the drugs in the context of controlling resurgent bed bug populations on poultry farms.

Fluralaner and ivermectin, which are used to kill fleas and ticks on household pets like dogs and cats, among other uses, were tested for their effectiveness in killing bed bugs. In a collaboration between entomologists and veterinary scientists from NC State's College of Veterinary Medicine, researchers tested bed bug mortality rates in different experiments: after the pests consumed blood mixed with the drugs on the lab bench and after bed bugs bit and fed off chickens that had either ingested or received topical treatment with the drugs.

Fluralaner is a relatively new, longer-lasting anti-parasitic drug used mostly for companion animals; however, Europe and Australia have approved its use for the poultry industry. Besides household pet uses, ivermectin effectively serves anti-parasitic uses in human populations, particularly in Africa, as well as in larger animals.

Both drugs showed powerful efficacy on the lab bench, killing most bed bugs, although fluralaner performed much more effectively on bed bugs that showed resistance to common insecticides.

“The drugs affect receptors in the insect’s nervous system,” said Coby Schal, Blanton J. Whitmire Distinguished Professor of Entomology at NC State and the corresponding author of a paper describing the work.

Fluralaner was highly effective at killing bed bugs that fed on chickens dosed with the drug. Ivermectin, meanwhile, was ineffective against bed bugs that fed on dosed chickens.

“We used the recommended dosage of ivermectin, either in a topical form or ingested, but neither was able to kill bed bugs,” said Maria González-Morales, a former Ph.D. student at NC State and the first author of the paper.

The researchers say that chickens could be quickly metabolizing or clearing ivermectin from their systems.

“The bed bug is a globally important insect,” Schal said. “The last few decades have seen a resurgence of bed bugs in homes, and now we’re seeing bed bugs return to poultry farms. Since there is no proven method to stop bed bugs in commercial farms, the potential problems on poultry farms could be massive. We’re trying to get ahead of it by developing technologies that can eliminate bed bugs.”

“The health effects to poultry from bed bug infestation are not well documented, but anecdotally poultry farmers see animal welfare concerns like stress and anemia, which could negatively affect meat or egg production,” González-Morales said.

“There are also concerns for workers on these farms considering how easily bed bugs can spread from poultry to people,” Schal added.

The researchers say that dosing fluralaner in poultry drinking water could serve as an effective measure against bed bugs. A combination of monitoring, education, heat treatments and fluralaner could hold the

key to eradicating bed bugs from infested poultry farms, they add.

The study appears in *Parasites & Vectors*. Andrea E. Thomson, Olivia A. Petritz, Rocio Crespo, Ahmed Haija, Richard G. Santangelo co-authored the paper. Funding was provided by the Blanton J. Whitmire Endowment at NC State, and grants from the U.S. Department of Housing and Urban Development Healthy Homes program (NCHHU0053-19) and the National Science Foundation (DEB-1754190).

(PCT, August 2, 2023)

<https://www.pctonline.com/news/common-veterinary-drugs-effectiveness-against-bed-bugs/>

## **CDC WARNS OF EMERGING TICK BITE-ASSOCIATED MEAT ALLERGY**

The [CDC reports](#) that between 2010 and 2022, there were more than 110,000 suspected cases of alpha-gal syndrome identified. However, because the diagnosis of alpha-gal syndrome requires a positive diagnostic test and a clinical exam, and some individuals with alpha-gal syndrome may not get tested, it is estimated that as many as 450,000 people might have been affected by AGS in the United States, according to two reports issued today by the CDC in the *Morbidity and Mortality Weekly Report*. Studies show that many healthcare providers in the United States are not familiar with an emerging and potentially life-threatening allergic condition called alpha-gal syndrome (AGS), also known as the red-meat allergy or the tick bite meat allergy. Of those aware of AGS, knowledge about diagnosis and management is low.

In one study, 1,500 family/general practitioners, internists, pediatricians, nurse practitioners (NPs), and physician assistants (PAs) across the country were surveyed, and results showed that nearly half

of respondents had not heard of AGS, approximately one-third reported that they were ‘not too confident’ in their ability to diagnose or manage patients with AGS, and five percent felt ‘very confident’ in their ability. In another study, CDC researchers examined laboratory test results from 2017 to 2022 from a laboratory that, until August 2021, was the primary commercial lab offering testing in the United States. More than 300,000 specimens were submitted by healthcare providers on behalf of patients with presumed clinical suspicion of AGS, and more than 30 percent were positive.

“Alpha-gal syndrome is an important emerging public health problem, with potentially severe health impacts that can last a lifetime for some patients,” said Dr. Ann Carpenter, epidemiologist and lead author of one of the papers released today. “It’s critical for clinicians to be aware of AGS so they can properly evaluate, diagnose, and manage their patients and also educate them on tick-bite prevention to protect patients from developing this allergic condition.”

Alpha-gal is a sugar found in meat from mammals (pork, beef, rabbit, lamb, venison, etc.) and products made from mammals (e.g., gelatin, cow’s milk, milk products, some pharmaceuticals). AGS is a serious allergic condition some people experience after they consume food or products containing alpha-gal. Growing evidence suggests that AGS is primarily associated with the bite of a lone star tick in the United States, but other kinds of ticks have not been ruled out. Localities in the southern, midwestern, and mid-Atlantic regions of the United States identified more people who tested positive.

“The burden of alpha-gal syndrome in the United States could be substantial given the large percentage of cases suspected to be going undiagnosed due to non-specific and inconsistent symptoms, challenges seeking healthcare, and lack of clinician awareness,” said Dr. Johanna Salzer,

senior author on both papers released today. “It’s important that people who think they may suffer from AGS see their healthcare provider or an allergist, provide a detailed history of symptoms, get a physical examination, and a blood test that looks for specific antibodies (proteins made by your immune system) to alpha-gal.” (PCT August 24, 2023) <https://www.pctonline.com/news/cdc-tick-meat-allergy-alpha-gal-syndrome/>

## CEU Meetings

Please note that some of these meetings are virtual using Zoom or Microsoft Teams. Please contact the meeting host directly if you have any questions.

### Date: September 14-15, 2023

Title: OPMA Fall Conference

Location: Hard Rock Hotel & Casino Catoosa OK

Contact: (405) 726-8773

<https://www.ok-pca.com/conferences>

CEU's:	Category(s):
5	3A
4	6
5	7A
5	7B
3	7C

### Date: September 20, 2023

Title: Adair County Pasture Tour

Location: Adair County call Extension Office

Contact: Jennifer Patterson (918) 696-2253

CEU's:	Category(s):
2	Private
2	1A
2	10

### Date: October 4-5, 2023

Title: OKVMA FALL Conference 2023

Location: Hard Rock Hotel & Casino Catoosa OK

Contact: Kiersten Riggs (918) 314-9032

<https://okvma.com/conferences/>

CEU's:	Category(s):
6	1A
1	1B
1	2
6	3A
1	3C
6	5
7	6
2	7A
1	7B
1	7C
8	10
6	Private

## 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](http://www.allstarce.com)

### Wood Destroying Organism Inspection Course

[www.nachi.org/wdocourse.htm](http://www.nachi.org/wdocourse.htm)

### CTN Educational Services Inc

[http://ctnedu.com/oklahoma\\_applicator\\_enroll.html](http://ctnedu.com/oklahoma_applicator_enroll.html)

### Pest Network

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

### Veseris

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

### AG CEU Online

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

### Target Specialty Products Online Training

<https://www.target-specialty.com/training/online-training>

### MarKev Training

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

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

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

Find us on Twitter at @OkstatePestEd

## ODAFF Test Information

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 <https://bit.ly/3sF4y0x>.

**Reservation must be made in advance** at [www.psiexams.com/](http://www.psiexams.com/) or call **855-579-4643**

### PSI locations.

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

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

Norman Moore Norman Technology Center, 4701  
12th Ave NW, Norman, Oklahoma, 73070

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

Kevin Shelton  
405-744-1060 [kevin.shelton@okstate.edu](mailto:kevin.shelton@okstate.edu) or

Charles Luper  
405-744-5808 [charles.luper@okstate.edu](mailto:charles.luper@okstate.edu)

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