

PESTICIDE REPORTS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University
<http://pested.okstate.edu>



May, 2019

CHEM

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UNWANTED PESTICIDE DISPOSAL COLLECTION TO BE HELD MAY 21 IN MCALESTER

The next Unwanted Pesticide Disposal Program collection date will occur May 21st, 2019 in McAlester. The location will be at the McAlester Expo Center. The Disposal will run from 8 a.m. to 1 p.m. rain or shine.

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.

May 21st McAlester Expo Center

For more information please go to
<http://pested.okstate.edu/html/unwanted.html>

EPA TAKES NEXT STEP IN REVIEW PROCESS FOR HERBICIDE GLYPHOSATE, REAFFIRMS NO RISK TO PUBLIC HEALTH

Today, the U.S. Environmental Protection Agency (EPA) is taking an important step in the agency's review of glyphosate. As part of this action, EPA

continues to find that there are no risks to public health when glyphosate is used in accordance with its current label and that glyphosate is not a carcinogen. The agency's scientific findings on human health risk are consistent with the conclusions of science reviews by many other countries and other federal agencies. While the agency did not identify public health risks in the 2017 human health risk assessment, the 2017 ecological assessment did identify ecological risks. To address these risks, EPA is proposing management measures to help farmers target pesticide sprays on the intended pest, protect pollinators, and reduce the problem of weeds becoming resistant to glyphosate.

“EPA has found no risks to public health from the current registered uses of glyphosate,” said **EPA Administrator Andrew Wheeler**. “Today’s proposed action includes new management measures that will help farmers use glyphosate in the most effective and efficient way possible, including pollinator protections. We look forward to input from farmers and other stakeholders to ensure that the draft management measures are workable, realistic, and effective.”

“If we are going to feed 10 billion people by 2050, we are going to need all the tools at our disposal, which includes the use the glyphosate,” **U.S. Secretary of Agriculture Sonny Perdue** said. “USDA applauds EPA’s proposed registration decision as it is science-based and consistent with the findings of other regulatory authorities that glyphosate does not pose a carcinogenic hazard to humans.”

Glyphosate is the most widely used herbicide in U.S. agriculture and has been studied for decades. Glyphosate is used on more than 100 food crops, including glyphosate-resistant corn, soybean, cotton, canola and sugar beet. Non-agricultural uses include residential areas, aquatic areas, forests, rights of way, ornamentals and turf.

Once the Federal Register notice publishes, the public will be able to submit comments on EPA’s proposed decision at www.regulations.gov in docket # [EPA-HQ-OPP-2009-0361](https://www.regulations.gov/docket/EPA-HQ-OPP-2009-0361). Public comments will be due 60 days after the date of

publication in Federal Register. EPA’s responses to the comments received on the draft ecological and human health risk assessments and the benefits assessment will be in the docket.

[Find more information about glyphosate, including today’s proposed interim decision and supporting documents.](#)

[See the glyphosate draft risk assessments and supporting documents.](https://www.epa.gov/pesticides/epa-takes-next-step-review-process-herbicide-glyphosate-reaffirms-no-risk-public-health) (EPA April 30, 2019)
<https://www.epa.gov/pesticides/epa-takes-next-step-review-process-herbicide-glyphosate-reaffirms-no-risk-public-health>

JUNE TEST HELP DATES

The OSU Pesticide Safety Education Program will conduct the next test help workshops for 2019 in June. The workshops will be held June 19th in Tulsa and June 25th in Oklahoma City.

The Oklahoma City Test help session will at the Oklahoma County Extension Office 2500 NE 63rd. The Tulsa session will be at the Tulsa County Extension Office at 4116 E. 15th.

The help sessions will focus on information covered in the core and service tech tests. OSU PSEP will answer any questions over other category tests during this session.

Applicators should acquire and study the manuals before coming to the help session for optimum success. Study manuals can be purchased by using the manual order form available at our website <http://pested.okstate.edu/pdf/order.pdf> or by calling University Mailing at 405-744-9037.

ODAFF Testing fees are not included in the registration fee and must be paid separately.

Register online at the Pesticide Safety Education Program (PSEP) website at <http://pested.okstate.edu/html/practical.htm>.

Registration forms can also be downloaded from the website.

Registration will start at 8:30 and the program will run from 8:45 am to 12:30 pm at both locations. Testing will begin at 1:30 pm at both locations.

NO CEU's will be given for this program!

Please check our website below for future test help dates.

<http://pested.okstate.edu/html/practical.htm>

AGRONOMIST WARNS OF ROOTWORM RESISTANCE TO BT VARIETIES

In western Kansas and Nebraska and the panhandles of Texas and Oklahoma, the corn rootworm is a big problem.

Over the years, as populations have steadily grown, plant varieties utilizing BT technology have been the best answers to combat the rootworm pest. It has been uniquely effective. That's a source of concern for Spencer McIntosh, agronomist at Golden Harvest Seeds.

"Planting varieties with the BT trait is the most cost-effective tool we have and there has been a great deal of reliance on BT technology since it was introduced 15 years ago," McIntosh says. "My concern is that there has been too much reliance on one technology and we are putting too much selective pressure on the corn rootworm."

Corn rootworms are not really much of a problem in southeast and south-central Kansas, he says.

"Rotation is very important both for crops and for pesticides," McIntosh says. "In recent years, we have seen some drop in the control we are getting with the BT trait. We need to take a look at going back to adding another insecticide in areas where there is heavy pressure."

Soil insecticides over the top of BT varieties are available and were the tools most often used before the introduction of the BT trait.

Counter and Force are both still on the market and either is a good add to BT varieties to help assure that rootworm control is complete, he says.

"One thing that farmers do have to be aware of is that organophosphates can have an impact on how herbicides are metabolized," McIntosh says. It is manageable, but producers need to be aware of it.

He said there are insecticide boxes on many planters that can apply Counter and Force and can be set up for injection into the fertilizer lines.

It is important for growers to watch for the beetles that lay the eggs that become rootworms, he says. If they are not getting complete beetle control, there is an increased risk for problems to develop.

"We are seeing increased tolerance for bifenthrin in both the beetles and the larvae," he says. "In some cases, even resistance is being noted. We need to try to relate back to our experience with weeds. High selective pressure results in resistant species."

He stressed that the beetles do not mutate as a result of exposure to BT. Rather, in every species, there are some individuals with natural immunity to the chemical. When there is high selective pressure, the susceptible beetles are killed, leaving the resistant ones to multiply.

One insecticide that farmers may want to consider is Steward, which has a different mode of action and can help manage beetles later in the season.

McIntosh warns that farmers make mistakes in deciding on the need for insecticides.

One mistake is to assume that a second or third year of corn on corn fields will have only light pressure. Unfortunately, the beetles are mobile. They like to feed on silks. They can then migrate into first-year corn and lay eggs. Those eggs will hatch in second-year corn and you can have heavy rootworm pressure, McIntosh says.

Some corn varieties may have early maturity dates and some corn is cut early for silage. In those instances, the beetles will fly out of those fields and head for fields where there is still food for them.

“I can’t stress enough that you can’t rely on just one mode of action,” he says. “The old saying ‘an ounce of prevention is worth a pound of cure’ really applies here. We need to invest now to prevent resistance from developing.”

He says the season of rootworm feeding has also lengthened in recent years.

“Before BT, we used to spray for beetles in late July,” McIntosh says. “Now, we are seeing rootworms all the time. I got a call in 2010 from a grower who had larvae feeding in August.”

He says the longer season is the result of active control measures being applied early. Soil insecticides will start to lose effectiveness after about six weeks. BT is very effective until about the 4 to 10 leaf stage then begins to wane.

“That tells me that we need to be more aware of beetle populations later in the season,” he says. (Southwest FarmPress, April 26, 2019) <https://www.farmprogress.com/crop-protection/agronomist-warns-rootworm-resistance-bt-varieties>

USDA NIFA WORKING TO CONTROL INVASIVE PESTS

Editor’s note: Secretary of Agriculture Sonny Perdue on April 1 proclaimed “Invasive Plant Pest and Disease Awareness Month.” The following illustrates some of the research that USDA’s National Institute of Food and Agriculture supports to control invasive pests in agriculture.

Good things come in small packages, right? Not always.

Oftentimes, what may appear to be a vibrant field of pastoral charm or gently blowing golden waves of

grain are actually battlefields where small invading armies threaten the nation’s economic, social, and environmental well-being.

“Nearly every terrestrial, wetland, and aquatic ecosystem in the United States has been invaded by non-native species, with economic losses estimated at \$137 billion per year,” said Robert Nowierski, national program leader for biobased pest management at USDA’s National Institute of Food and Agriculture (NIFA).

NIFA is in the vanguard of the fight to control, mitigate, and eradicate invasive pests, through funding and national program leadership. NIFA’s invasive pest portfolio includes sponsorship of four Regional Integrated Pest Management (IPM) Centers; establishment of the National Plant and Animal Diagnostic Laboratory Networks; and funding State Agricultural Experiment Station projects, the regional research and extension efforts of multi-state committees, and plant production and protection research conducted through the Small Business Innovation Research program.

IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques, such as biological control, habitat manipulation, modification of cultural practices, use of resistant varieties, and minimizing the use of pesticides. Benefits of IPM include greater survival of a pest’s natural enemies, slower development of pesticide resistance, less pest resurgence, fewer outbreaks of secondary pests, less negative impact on the environment, and greater worker safety. In addition, many farmers report greater profits because they’ve reduced their expenses on pesticide.

NIFA’s programs support projects from research discovery, through research and development, to extension education and implementation of plans. Some of the higher profile invasive pest projects include the brown marmorated stink bug, spotted wing drosophila, West Nile virus, and the spotted lanternfly.

According to Nowierski, the spotted lanternfly is probably the showiest of the invasive species pests. “I was on an invasive species field tour last year and visited a farmer’s grape vineyard severely impacted by the spotted lanternfly. He lost half-a-million dollars from spotted lanternfly damage to his 40-acre vineyard in 2017!” (PCT Online, April 10, 2019) <https://www.pctonline.com/article/usda-nifa-invasive-pest-research/>

COURT ORDERS US EPA TO ACT ON CHLORPYRIFOS

A US federal appeals court has ordered the EPA to make a final decision by mid-July on whether it will revoke food tolerances for chlorpyrifos and ban agricultural uses of the insecticide.

The ruling by the US Court of Appeals for the Ninth Circuit is a victory for environmentalists and farmworker advocates keen to see chlorpyrifos pulled from the market but is unlikely to end the long-running legal controversy surrounding the insecticide. The decision provides no assurances that the EPA will agree that current exposures pose undue risks to children and ban the active ingredient – and any move to allow continued uses on food crops will certainly be challenged in court.

The Court declined to consider the merits of arguments by the Natural Resources Defense Council (NRDC) and others who filed suit to reverse a March 2017 decision by the Trump administration to back away from an EPA plan that would have banned chlorpyrifos.

The controversy stretches back more than a decade to a 2007 petition filed by the NRDC and Pesticide Action Network calling on EPA to revoke food tolerances because of evidence that chlorpyrifos causes neurological harm to children.

The EPA resisted responding to the petition until the Ninth Circuit ordered it to do so and in 2016 the Agency concluded that a ban was warranted after determining that cumulative exposures exceeded

federal safety limits set under the Federal Food, Drug and Cosmetic Act (FFDCA).

The Agency proposed granting the petition, but then EPA Administrator Scott Pruitt reversed course in March 2017, issuing an order denying the petition. Mr Pruitt said that he agreed with farm groups and agrochemical industry interests who questioned the scientific integrity of the EPA’s review. Critics of banning chlorpyrifos contend that there are no affordable, effective alternatives and downplay worry about the risks to human health at measured exposure levels.

The interest of farm groups and the agrochemical industry reflects the widespread use of chlorpyrifos – the EPA estimates that some 5 million lbs (2,200 tonnes) of the insecticide are used on some 50 crops, including almonds, apples, citrus fruit, maize and strawberries. DowDuPont agriculture business Corteva Agriscience is the primary registrant and manufacturer of the insecticide.

The NRDC and its allies, as well as seven states, challenged Mr Pruitt’s order in court and, last August, a three-judge panel ruled 2-1 in their favour, concluding that the EPA failed to issue the required safety finding under the FFDCA to justify its decision not to issue the ban.

The panel called on the EPA to cancel registrations and revoke food tolerances for chlorpyrifos within 60 days, but the Trump administration appealed to the full Ninth Circuit. The 11-judge en banc panel heard oral arguments in March and several judges voiced frustration with the Agency’s inaction, but also noted some concern about ruling on the underlying dispute until the EPA completes its administrative review of objections to Mr Pruitt’s order.

During that discussion, the Department of Justice attorney arguing for the EPA told the en banc panel that the Agency could respond to the administrative objections within 90 days of a court order.

The Court noted those comments in its April 19th ruling and ordered the EPA to issue “no later than 90 days after the filing of this order, a full and final decision” on the objections to the petition denial.

“Given this resolution, we need not – and do not – decide any other issue urged by the parties,” the Court added. “The en banc court shall retain jurisdiction over this and any related cases.”

Earthjustice attorney Patti Goldman, who argued the case for the plaintiffs, welcomes the ruling but is dismayed at the continued delay by the EPA. “We commend the Court for this ruling as it forces the EPA to stop stalling,” she says. “While we are moving forward, the tragedy is that children are being exposed to chlorpyrifos, a pesticide science has long shown is unsafe.”

Frustration with the EPA’s failure to ban chlorpyrifos has prompted the state of Hawaii to impose its own ban and led lawmakers in at least six other states to consider similar legislation. Democrats in the House as well as the Senate have also introduced bills to ban the insecticide and last week, Senator Kirsten Gillibrand, a New York Democrat and presidential candidate, introduced a proposal to effectively bar public schools from serving food with any detectable residues. (Pesticide & Chemical Policy/AGROW, April 23, 2019)

CALIFORNIA MOVES A STEP CLOSER TO RODENTICIDE BAN

The office of California Assembly member Richard Bloom (D-Santa Monica) reports legislation to ban certain rodenticides passed the Water, Parks and Wildlife Committee on April 9; the bill already passed the Environmental Safety and Toxic Materials Committee on March 26. The bill now heads to the Assembly Appropriations Committee for approval.

Bill AB 1788 would ban second-generation anticoagulant rodenticides (SGARs) for use in California, and ban first-generation anticoagulant rodenticides (FGARs) on state-owned property. It does not include an exemption for the use of these products during a public health emergency, according to the National Pest Management Association (NPMA). If passed, California would

be the first state in the country to impose an all-out ban of these products.

The proposed rodenticide ban has long been in the works and follows California’s precedent of introducing the strictest environmental legislation of any state.

As PMP reported in February, the California Department of Pesticide Regulation (DPR) announced plans in November to reevaluate SGARs brodifacoum, bromadiolone, difenacoum and difethialone. These rodenticides were named Restricted Materials the last time they were assessed in 2014.

The NPMA said activist groups cited data and studies that prompted the DPR to reevaluate SGARs. “These groups maintain that SGARs may have an ‘adverse impact’ on non-target animals,” writes PMP Senior Editor Diane Sofranec in PMP’s February Regulatory Report column.

Following DPR’s announcement, the NPMA, the Pest Control Operators of California (PCOC) and other entities partnered to resist the re-evaluation of SGARs. They submitted comments in January that questioned the validity of the data and studies presented to the DPR, and argued banning SGARs would adversely affect public health and the economy in California.

“The NPMA and PCOC will continue to work together to oppose AB 1788, which would limit the ability of pest management professionals (PMPs) to protect the citizens of California from disease and destruction attributed to rats and mice,” said Jake Plevelich, the NPMA’s director of Public Policy. “Since the launch of our grassroots campaign opposing AB 1788, over 2,800 messages were sent to California lawmakers, in addition to the numerous phone calls made.”

The NPMA applauds all the members who showed up in force on April 9 to oppose AB 1788. “Although we don’t anticipate it will be an easy fight, we will continue to work together to oppose the bill as it moves to appropriations,” he added.

Pest management professionals who want to help can send a message to legislators. (Pest Management Professional, April 10, 2019) <https://www.mypmp.net/2019/04/10/california-moves-a-step-closer-to-rodenticide-ban/>

BAYER TAKES AIM AT \$78 MILLION GLYPHOSATE VERDICT

Bayer is appealing a California court verdict ordering the company to pay \$78.5 million to a cancer victim who alleged that exposure to legacy company Monsanto's glyphosate-based herbicides caused his terminal illness. Bayer argues that the decision and award "cannot be reconciled with either the law or sound science".

The appeal claims that the verdict is unwarranted as "not one national or international regulator has ever concluded that these products cause cancer in humans".

The verdict in question was handed down last August by a 12-member jury convened by the San Francisco County Superior Court. After a six-week trial, the jury unanimously sided with plaintiff Dewayne Johnson, awarding him some \$39 million in compensatory damages and \$250 million in punitive damages, subsequently reduced to \$39 million.

The 46-year old was a groundskeeper for a Solano County school district from 2012 -2016 and frequently sprayed Monsanto's glyphosate-based herbicides (GBHs).

Diagnosed in 2014 with non-Hodkgin's Lymphoma, Mr Johnson alleged that his terminal illness was caused by his exposure to the Monsanto herbicides. The jury agreed that Monsanto failed to warn Mr Johnson that its pesticides could cause cancer and concluded that the company had shown malice in downplaying evidence of the risks.

California Superior Court Judge Suzanne Bolanos in October denied Bayer's bid to reverse the ruling but reduced the award to \$78.5 million. The company's appeal to the California Court of Appeals for the First District, filed on Wednesday (April 24th), asks for the verdict to be vacated or for a new trial.

Bayer argues that the trial was "notable for both the exclusion of key evidence and for the distortion of reliable science".

The company says that there is no reason for the jury to have accepted the argument that Monsanto had failed to warn Johnson about the cancer risks from its Roundup weed killer.

"The bottom line ... is there is no evidence that Monsanto had actual knowledge that its glyphosate-based herbicides cause cancer," according to Bayer. "Nor could there be, when the scientific consensus, consistently accepted by EPA and other regulators around the world, contradicts that conclusion."

Bayer notes that Johnson was diagnosed with his illness prior to the 2015 declaration of the WHO's International Agency for Research on Cancer (IARC) that glyphosate is a "probable human carcinogen" -- a key piece of evidence used the plaintiff's attorneys to support the lawsuit.

"As a result, there was no known or knowable risk and therefore no duty to warn under either strict liability or negligence theories," according to the company's 96-page appeal. "Even if IARC's post-hoc conclusions were relevant to Monsanto's duty to warn [the] plaintiff ... they at best represent a minority view that the United States Environmental Protection Agency and numerous worldwide regulators specifically rejected."

Bayer says that the plaintiff failed to show convincing evidence that glyphosate could cause cancer and contends that the verdict should be preempted by federal law, which bars a court from imposing liability under state law for the failure to warn about an alleged risk or defect that the EPA has determined is not supported by science.

VIETNAM BANS GLYPHOSATE IMPORTS

Vietnam banned the import of glyphosate-containing herbicides after a U.S. court ruled the weed killer could cause cancer, according to the New China News Agency. Products already in circulation in the country are not affected by this decision.

“As soon as we heard the second U.S. trial’s verdict that glyphosate is related to cancer, we have issued a document to ban new herbicide imports containing the active ingredient. The removal of this substance from the list of usable herbicides in Vietnam will also be issued in the near future,” daily newspaper Tuoi Tre (Youth) quoted the department’s head Hoang Trung as saying.

Related: Bayer loses second trial over claims Roundup causes cancer

Agriculture Secretary Sonny Perdue issued the following statement in response to the announcement by Vietnam’s Ministry of Agriculture and Rural Development that Vietnam will ban the importation of glyphosate:

“We are disappointed in Vietnam’s decision to ban glyphosate, a move that will have devastating impacts on global agricultural production. As I’ve often said, if we’re going to feed 10 billion people by 2050, farmers worldwide need all the tools and technologies at our disposal.

Related: Did Monsanto fail to warn consumers about risks of Roundup?

“On numerous occasions, USDA has shared scientific studies with MARD from the U.S. Environmental Protection Agency and other internationally recognized regulatory bodies concluding that glyphosate is unlikely to pose a carcinogenic hazard to humans. This ban flies on the face of that scientific evidence. Furthermore, Vietnam has sidestepped its obligation to notify this regulatory change to the World Trade Organization.

The company also takes issue with how Bolanos handled the trial, arguing that the judge had wrongly allowed consideration of the IARC declaration while prohibiting it from discussing documents from the EPA and other regulators that conclude "there is no basis" to the view that Roundup and other glyphosate-based herbicides pose cancer risks to consumers.

"The combined effect of these rulings allowed [the] plaintiff to paint a distorted reality to the jury, arguing that only IARC’s conclusions could be considered for their truth in reaching the verdict," according to Bayer.

Settlement talks

The glyphosate litigation aimed at Monsanto has proven to be a major headache for Bayer, which last year purchased the US pesticide and seed company for some \$63 billion. Bayer's stock has dropped 30% since Mr Johnson won his case last August, a decrease equaling some \$30 billion in value, and Bayer faces thousands of similar complaints in federal and state courts.

Last month, the company suffered another blow when a federal jury ruled in favour of another cancer victim. The decision came in the first "bellwether trial" under the review of US District Judge Vince Chhabria, who is overseeing more than 800 similar lawsuits. The jury's verdict prompted Judge Chhabria to delay the next trial and order the parties to begin "confidential mediation" aimed at settling the remaining complaints.

In response to Judge Chhabria's April 11th order, Bayer said that it will comply and enter into talks, but still intends to stoutly defend the safety of glyphosate.

"As this litigation is still in the early stages, with only two verdicts and no cases that have run their course through appeal, we will also remain focused on defending the safety of glyphosate-based herbicides in court," the company says. (Pesticide & Chemical Policy/AGROW, April 26, 2019)

“Vietnam also needs to look at the potential ramifications for its own farmers. In addition to the immediate effect of slowing the development of Vietnamese agricultural production, there’s the very real risk that Vietnam’s farmers will turn to unregulated, illegal chemical products in place of glyphosate.” (Southwest FarmPress, April 11, 2019) <https://www.farmprogress.com/herbicide/vietnam-bans-glyphosate-imports>

SPIDERS RISK EXPOSURE FOR LOVE

Spiders that pretend to be ants to fool predators have an unusual problem when it comes to sex.

How do they get the attention of potential mates without breaking character to birds that want to eat them?

University of Cincinnati biologists say evolution might provide an elegant solution. Viewed from above, the mimics look like skinny, three-segmented ants to fool predators. But in profile, the adult mimics retain their more voluptuous and alluring spider figure to woo nearby mates.

UC researchers presented their findings in January at the Society for Integrative and Comparative Biology conference in Tampa, Fla.

Most birds avoid ants and their painful stingers, sharp mandibles and habit of showing up with lots of friends. Try to eat one and you're likely to get chewed on by 10 more. That's why nearly every insect family from beetles to mantises has species that mimic ants.

By comparison, spiders are delicious and nutritious, said Alexis Dodson, a UC doctoral student and lead author.

"That's what a lot of natural selection is all about -- to convince other species not to eat you and convince members of your species to mate with you and to do so at the least cost possible," Dodson said.

Lots of insects and arachnids mimic ants because they're so formidable. Some plants, too, have evolved a mutually beneficial relationship with aggressive ants to discourage hungry leaf-eaters.

"Ants are distasteful," said Nathan Morehouse, assistant professor of biological sciences in UC's McMicken College of Arts and Sciences.

"They're well-defended and they come in big numbers. So a lot of animals avoid them," Morehouse said. "Unless you're a specialist like an anteater, they're just not a good meal."

Spiders occupy a three-dimensional world. But whether they're on the ground or climbing a tree, potential predators are likely to get a dorsal view, he said. "Thinking of vantage point is essential," Morehouse said. "From the top, juveniles and adults both look like ants. And juvenile spiders look very much like ants from the side. But adult spiders shift away from the ant profile toward a more traditional spider-like profile."

But it's not enough to look like an ant, Morehouse said. To fool clever predators, you have to act like one, too. The spiders have enormous back legs like ants. Spiders have an extra pair of legs compared to ants and no antennae. But ant mimics will wave their small forelegs in the air like ant antennae.

"The level of mimicry we encounter in jumping spiders is incredibly detailed," he said. "When ants follow a trail, they weave their heads back and forth. The ant is trying to cast back and forth over a chemical trail that's hard to find."

"Remarkably, jumping spiders also perform this weaving behavior even though it has no functional significance for them," Morehouse said. "They're trying to be convincing actors. They're trying to look like an ant."

UC researchers studied a jumping spider called *Synemosyna formica* found in Ohio and across eastern North America.

Jumping spiders are so named because they jump. Some can leap more than 50 times their body length. But ants don't jump. And neither do the spiders who pretend to be ants.

In fact, it's likely the mimics can't jump because their antlike frame won't allow it. Amazingly, Morehouse said, the ant mimics seem to have lost the ability to jump by copying ant locomotion so well.

"Some of it is biomechanics. They're constrained by the loading of their body weight," he said. "So they just sort of lurch. They're becoming more like ants in all kinds of ways. It's pretty neat."

UC researchers examined how close the spiders resemble ants using an elliptical Fourier analysis, a mathematical approach that compares complex shapes. It's an anatomical study called morphometrics.

S. formica is unusual for another reason: It mimics two different species of ants during its lifetime. To make the illusion more convincing, adult spiders will mimic *Camponotus*, a bigger kind of ant than the tinier black ants called *Crematogaster* the young spiderlings copy.

"I think that's the most surprising finding," UC postdoctoral researcher and study co-author David Outomuro said. "It makes a lot of sense to mimic something that matches your size."

Now UC researchers are studying how ant mimics communicate with each other without blowing their cover. Jumping spiders are renowned for their larger-than-life courtship rituals. Many such as the peacock jumping spider have flashy colors -- iridescent blues, greens and reds -- and perform showstopper courtship dances like some kind of arachnid vaudevillian.

"This is my passion project," Dodson said. "Do they have mating rituals like other jumping spiders?"

So far Dodson has only observed what she calls "handshake" behaviors, or spiders seeming to acknowledge each other from a distance.

"It's as if one says, 'Hi, I'm not an ant.' And the other says, 'I am also not an ant,'" Dodson said. "It's definitely there. It's distinct from just walking around. And it's not something I've seen an ant do."

But do the mimics retain their distinctive courtship ritual like other jumping spiders? Some spiders will take these intimate encounters below ground where it's safer, Outomuro said.

"If you do courtship outside, predators might perceive you as potential prey and the mimicry stops working," Outomuro said.

Morehouse said the possibilities are intriguing. Perhaps, spiders behave more like ants during courtship because their antlike bodies demand it. Or maybe they borrow cues from ant behavior to maintain their protective ruse during courtship.

"Or it's possible there are no antlike motions. When they court, they completely break character and behave like other jumping spiders," Morehouse said. "That's something Alexis is just beginning to understand."

Animal mimicry has been studied extensively in many other species but not this particular jumping spider. That makes the research particularly exciting, Morehouse said.

"Alexis was first to recognize that the ant mimics look like spiders in profile. We're really breaking new ground here," Morehouse said. "We have to figure out how these animals can be obvious to each other but not obvious to other species." (PCT Online, April 24, 2019)

<https://www.pctonline.com/article/spiders-mimic-ants-university-cincinnati/>

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

CEU Meetings

Date: June 11-12, 2019

Title: Collins 2019 IPM for Food Plant Seminar

Location: Hershey, PA

Contact: Marie Gallagher (812) 425-7000

<http://collinspestmgt.com/register-for-seminar/>

CEU's:	Category(s):
8	7A
1	11A

Date: September 11, 2019

Title: General Pest Services (Defined by label/What does this mean to you?)

Location: Hampton Inn Edmond, OK

Contact: Donald Stetler (281) 217-2965

www.ensystem.com www.for-thor.com

CEU's:	Category(s):
4	3A
2	7A
3	7B

Date: September 10, 2019

Title: General Pest Services (Defined by label/What does this mean to you?)

Location: Hampton Inn Tulsa, OK

Contact: Donald Stetler (281) 217-2965

www.ensystem.com www.for-thor.com

CEU's:	Category(s):
4	3A
2	7A
3	7B

Date: September 12, 2019

Title: General Pest Services (Defined by label/What does this mean to you?)

Location: Hampton Inn Durant OK

Contact: Donald Stetler (281) 217-2965

www.ensystem.com www.for-thor.com

CEU's:	Category(s):
4	3A
2	7A
3	7B

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>

ODAFF Test Information

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

May		June	
7	OKC	13	Tulsa
7	Lawton	27	Tulsa
7	Goodwell		
9	Tulsa		
16	Enid	July	
30	Tulsa	9	McAlester
		11	Tulsa
		25	Tulsa

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

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

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

Tulsa: Tulsa County Extension Office 4116 E 15th St. (New Location)

Pesticide Safety Education Program



Oklahoma Unwanted Pesticide Disposal Program

<http://pested.okstate.edu/html/unwanted.html>



May 2019

When & Where?
8:00 am to 1:00 pm

DATE	May 21, 2019
COUNTY	Pittsburgh County
CITY	McAlester
LOCATION	McAlester Expo Center W of McAlester on Highway 270

What is the Oklahoma Unwanted Pesticide Disposal program?

The Oklahoma Department of Agriculture, Food and Forestry is funding a program to help collect and properly dispose of unwanted pesticides that homeowners, farmers, ranchers, commercial applicators, or dealers may have. For future locations and dates check the website listed above.

What are unwanted pesticides?

Unwanted pesticides are pesticides that are unusable as originally intended for various reasons. Unwanted pesticides are leftover pesticides, pesticides that are no longer registered in the state of Oklahoma, pesticides that no longer have labels and pesticides that are no longer identifiable.

Who is eligible to participate and what does it cost?

Oklahoma commercial and non-commercial applicators and pesticide dealers may participate. Oklahoma farmers and ranchers and homeowners can use the program as well. **There is no cost for the first 2,000 pounds of pesticides brought in by a participant.**

- Liquid pesticide weighs about 10 pounds per gallon.

Will someone pick up my pesticides for me?

No it is the owner's responsibility to transport the pesticides to the site. Some transportation tips can be found at <http://pested.okstate.edu/pdf/transport.pdf>

What are the steps to participate in the collection program?

Applicators, homeowners, farmers, and ranchers are not required to pre-register. Dealers are asked to voluntarily pre-register through the OSU Pesticide Safety Education Program. After completing pre-registration requirements, if required, bring unwanted pesticides safely to one of the collection sites. Visit the OSU Pesticide Safety Education Program for information and how to register at <http://pested.okstate.edu/html/unwanted.html>.

Why are dealers asked to pre-register?

Dealers are asked to pre-register due to the potential of large quantities coming from multiple dealers and/or multiple locations. This allows the contractor to plan the appropriate resources to handle the quantity of pesticides that comes into the collections.

Will the department use my participation in the program as a means to prosecute for illegal management of pesticides?

No, the disposal program is a service program designed to remove unusable pesticides from storage and reduce the potential threat to public health and the environment. Those disposing of pesticides will not be required to provide their names or details on their chemicals. The disposal service is free up to 2,000 pounds.

Contact Information:



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