

PESTICIDE REPORTS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University

<http://pested.okstate.edu>



April, 2016

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APRIL TEST HELP SESSIONS

The OSU Pesticide Safety Education Program will conduct the next test help sessions for 2016 in April. The workshops will be held April 7th in Tulsa and April 12th in Oklahoma City.

The Oklahoma City Test help session will be at the OSU-OKC Agriculture Resource Center (ARC) 400 N Portland. 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 405-744-5385.

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!

More Test Help Workshop dates are scheduled for 2016. Please go to the website below for more 2016 dates.

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

EPA SEEKS COMMENT ON PROPOSED DECISION TO REGISTER DICAMBA FOR USE ON GENETICALLY-ENGINEERED CROPS

The EPA is proposing to register dicamba to control weeds in cotton and soybean genetically engineered (GE) to tolerate dicamba.

Weeds that are becoming increasingly resistant to glyphosate-based herbicides are posing a problem for farmers. If finalized, EPA's action will provide an additional tool to reduce the spread of glyphosate resistant weeds. To ensure that dicamba successfully manages weed resistance problems, the proposed decision outlines a Herbicide Resistance Management Plan which includes robust monitoring and reporting any suspected resistance to EPA, grower education and remediation. Additionally, EPA is proposing to limit the registration to 5 years, which would further provide protections if resistance to dicamba develops.

EPA is soliciting public comment for 30 days. Comments on the EPA's proposed regulatory decision must be submitted no later than April 30, 2016. Comments may be submitted to the EPA docket EPA-HQ-OPP-2016-0187 at www.regulations.gov. After the comment period closes, EPA will review all of the comments and reach a final decision, which the Agency expects to issue in late summer or early fall 2016.

[Questions and Answers about this proposal are available.](#) (EPA April 1, 2016)
<https://www.epa.gov/pesticides/epa-seeks-comment-proposed-decision-register-dicamba-use-genetically-engineered-crops>

NOVEL MODE OF ACTION SPURS COMMITTEE TO CREATE NEW FRAC GROUP FOR FRACTURE FUNGICIDE

The Fungicide Resistance Action Committee (FRAC) has assigned Fracture fungicide from FMC to a newly created FRAC Group. When FMC launched Fracture fungicide in 2015, the broad spectrum, biological fungicide formulated with ProBLAD technology had such a unique mode of action that it could not be classified by current FRAC Group codes.

FRAC codes are created by the Fungicide Resistance Action Committee to group fungicide active ingredients by modes and sites of action to prolong the effectiveness of at-risk fungicides and to limit crop losses should resistance occur. The FRAC codes also help growers and PCAs identify which products to rotate to maintain effective disease control and minimize resistance development.

The Committee recently added the new FRAC Group M12 for Fracture fungicide and its active ingredient, the lupine extract called BLAD. Like other M group classifications, Fracture fungicide has “multi-site contact activity” and is considered a low risk for development of resistance, according to the FRAC publication.

Fracture fungicide provides decisive, multi-site control in a way no other fungicide can claim. It works on contact by binding to the fungal cell and deforming the chitin, disrupting nutrient absorption and inhibiting fungal cell production. This action tears a hole in the cell wall and ultimately destroys the fungal cell. Within eight hours, the fungal cell is dead.

“The assigning of Fracture fungicide to the new FRAC Group M12 demonstrates its value as a powerful resistance management tool. In the FRAC system, ‘M’ group fungicides are considered the best for fighting resistance due to the fact that they attack multiple sites within the fungus,” said David Davies, FMC Agricultural Solutions North America segment manager. “By offering an entirely new mode of action that complements synthetic fungicides, Fracture fungicide expands growers’ options and will help extend the lifespan of other chemistries.”

Fracture fungicide is labeled for the prevention and control of powdery mildew, botrytis, and brown rot blossom blight. It is a patented fungicide labeled for use in the U.S. on almonds, grapes, strawberries, and tomatoes. With a one-day pre-harvest interval and a four-hour re-entry interval, Fracture fungicide can be applied up to five times per season, providing growers with a flexible management tool that offers quick, reliable disease control that meets or exceeds established standards.

Ecotoxicology studies conducted to meet regulatory requirements have shown Fracture fungicide is nontoxic to adult bees, bee larvae, beneficial parasitic wasps and predatory mites. Fracture fungicide should be used as part of a complete spray program for disease control and resistance management (CropLife March 21, 2016)

<http://www.croplife.com/crop-inputs/fungicides/novel-mode-of-action-spurs-committee-to-create-new-frac-group-for-fracture-fungicide/>

PALMER AMARANTH CONTINUES NORTHWARD SPREAD

Many, many years ago – not too long after I started covering the agricultural marketplace – one of my first trips was to central Arkansas. There, while visiting a corn farm, I chanced across a huge plant in one of the crop fields I was in. “That sure looks healthy,” I casually remarked to the grower I was interviewing. “That,” he said before ripping the plant out of the ground, “is a pigweed, and from the looks of it, one that can’t be killed anymore by the chemistry I’m using here.”

Since that first encounter with pigweed, more commonly known as Palmer amaranth, this once “scourge of the South” weed variety as steadily advanced further northward with each passing crop season. In fact, as of the end 2015, 25 states across the country now report the presence of Palmer amaranth plants in their crop fields. Even more troubling, a good portion of these have developed resistance to many of the industry’s most popular herbicide control products, including glyphosate.

“We did a common garden study in Southern, Central, and Northern Illinois to ask if different varieties of Palmer amaranth from the south complete their life cycle in all three locations and cause yield loss in soybean,” said Adam Davis, a Weed Ecologist at the University of Illinois. “The short answer is yes: There are no current climate

limitations to any of the genotypes that we looked at. This is a serious weed.”

Furthermore, the yield losses are staggering. For example, while its cousin weed, tall waterhemp, can cause 30% yield loss when it is present in soybean fields in great numbers, Palmer amaranth’s presence can lead to up to 80% yield loss.

And observers think the Palmer amaranth situation could get much worse in 2016. As many industry insiders pointed out at the recent 2016 Commodity Classic show, 2015 was an exceptionally wet year for many of the Midwestern states. “This could have caused flooding across fields and moved some of the Palmer seeds into new territories than they’ve ever been in before,” predicted Dave Johnson, Product Development Manager for Soybean Herbicides at DuPont Crop Protection.

Experts all shared the same advice to curb Palmer amaranth’s spread: Ag retailers and their grower-customers should continually scout their fields for the weed and use different herbicides with multiple modes of action to keep it in check as best they can. The University of Illinois’ Davis also recommends diversifying cropping systems to include winter annuals and being extra careful when cleaning equipment, especially if it’s been purchased from out of state.

“[Palmer amaranth] can complete its life cycle in a very short period of time,” he said. “Even if you killed early season populations, if it comes up again in late summer, it can still produce seed by harvest time.” (CropLife March 25, 2016)

<http://www.croplife.com/editorial/palmer-amaranth-continues-northward-spread/>

NSF PUBLISHES ZIKA VIRUS ESTIMATED RISK MAP FOR 50 U.S. CITIES

Factors that can combine to produce a Zika virus outbreak are expected to be present in a number of

U.S. cities during peak summer months, new research shows.

The *Aedes aegypti* mosquito, which is spreading the virus in much of Latin America and the Caribbean, will likely become increasingly abundant across much of the southern and eastern United States as the weather warms, according to a new study led by mosquito and disease experts at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado.

Summertime weather conditions are favorable for populations of the mosquito along the East Coast as far north as New York City and across the southern tier of the country as far west as Phoenix and Los Angeles, according to specialized computer simulations by the researchers.

Spring and fall conditions can support low to moderate populations of the *Aedes aegypti* mosquito in more southern regions of its U.S. range. Wintertime weather is too cold for the species outside southern Florida and southern Texas, the study found.

By analyzing travel patterns from countries and territories with Zika outbreaks, the research team further concluded that cities in southern Florida and impoverished areas in southern Texas may be particularly vulnerable to local virus transmission.

The results are published in the peer-reviewed journal PLOS Currents: Outbreaks.

The research was funded by the National Institutes of Health, NASA, and the National Science Foundation (NSF), which is NCAR's sponsor, and was also co-authored by scientists at NASA, North Carolina State University, Maricopa County Environmental Services Vector Control Division, University of Arizona and Durham University.

"This research highlights the complex set of human and environmental factors that determine whether a mosquito-borne disease is carried from one area to another, and how severely it affects different human populations," said Sarah Ruth, program director in NSF's Division of Atmospheric and Geospace Sciences, which supports NCAR. "By integrating information on weather, travel patterns, mosquito biology and human behavior, the project team has improved our ability to forecast, deal with, and possibly even prevent future outbreaks of Zika and other serious diseases."

Timing and location of possible outbreaks

"This research can help us anticipate the timing and location of possible Zika virus outbreaks in certain U.S. cities," said NCAR scientist Andrew Monaghan, lead author of the study. "While there is much we still don't know about the dynamics of Zika virus transmission, understanding where the *Aedes aegypti* mosquito can survive in the U.S. and how its abundance fluctuates seasonally may help guide mosquito control efforts and public health preparedness."

Added NCAR scientist Mary Hayden, a medical anthropologist and co-author of the study, "Even if the virus is transmitted here in the continental U.S., a quick response can reduce its impact."

Although the study does not include a specific prediction for this year, the authors note that long-range forecasts for this summer point to a 40-45 percent chance of warmer-than-average temperatures over most of the continental United States. Monaghan said this could lead to increased suitability for *Aedes aegypti* in much of the South and East, although above-normal temperatures would be less favorable for the species in the hottest regions of Texas, Arizona and California.

Monaghan stressed that even if Zika establishes a toehold in the mainland United States, it is unlikely to spread as widely as in Latin America and the Caribbean. This is partly because a higher percentage of Americans live and work in air-conditioned and largely sealed homes and offices.

Spreading rapidly

First identified in Uganda in 1947, the Zika virus has moved through tropical regions of the world over the past decade. It was introduced into Brazil last year and spread explosively across Latin America and the Caribbean, with more than 20 countries now facing pandemics.

About 80 percent of infected people do not have significant symptoms, and most of the rest suffer relatively mild flu- or cold-like symptoms that generally clear up in about a week.

However, scientists are investigating whether contracting the disease during pregnancy can lead to microcephaly, a rare birth defect characterized by an abnormally small head and brain damage.

To determine the potential risk in the mainland United States, the research team ran two computer models that simulated the effect of meteorological conditions on a mosquito's entire lifecycle (egg, larval, pupal, and adult stages) in 50 cities in or near the known range of the species.

Monaghan and several team members have studied *Aedes aegypti* for years because it also carries the viruses that cause dengue and chikungunya.

Generally, the mosquitoes need warm and relatively stable temperatures, as well as water-filled containers such as buckets, barrels or tires, for their eggs to hatch. Once a mosquito bites an infected person, it also needs to live long enough—probably a week or more, depending on ambient temperatures—for the virus to travel from the

mosquito's mid-gut to its salivary glands. Once in the saliva, the virus can then be transmitted if the mosquito bites another person.

The study results show that, as springtime weather warms, the potential abundance of the mosquito begins to increase in April in the Southeast and in some Arizona cities.

By June, nearly all of the 50 cities studied have the potential for at least low-to-moderate abundance, and most eastern cities are suitable for moderate-to-high abundance. Conditions become most suitable for mosquito populations in July, August and September, although the peak times vary by city.

Weather conditions in southern and western cities remain suitable as late as November.

Even some cities where the *Aedes aegypti* mosquito has not been detected, such as St. Louis and Denver, have suitable mid-summer weather conditions for the species if it were introduced via transport of used tires or other human activities, according to the computer models.

The researchers stressed that additional factors outside the scope of the study could affect populations of the species, such as mosquito control efforts, competition with other mosquito species, and the extent to which eggs can survive in borderline temperatures.

However, researchers know little about *Aedes aegypti* because they have not focused on observing the species in much of its U.S. range.

The study noted that northern cities could become vulnerable if a related species of mosquito that is more tolerant of cold temperatures, *Aedes albopictus*, begins to carry the virus.

Factoring in travel, poverty

In addition to looking at meteorological conditions, the researchers studied two other key variables that could influence the potential for Zika outbreaks: travel from Zika-affected areas, and socioeconomic conditions in states that may face abundant mosquito populations.

To analyze air travel, the team estimated the number of passengers arriving in U.S. cities on direct flights from airports in 22 Latin American countries and territories listed on the Centers for Disease Control and Prevention's Zika travel advisory as of Jan. 29, 2016.

Cities that had both high potential numbers of *Aedes aegypti* and a large volume of air travelers included Miami, Houston and Orlando.

As the scientists were able to obtain passenger numbers for direct flights only, they could not estimate the number of passengers continuing on to smaller cities. They noted that the summertime peak in air travel coincides with the peak season in mosquito abundance.

The study also estimated that nearly five times as many people cross the U.S.-Mexico border per month than arrive by air in all 50 cities. This could indicate a high potential for transmission in border areas from Texas to California, although the Zika virus has not been widely reported in northern Mexico.

Those border areas, as well as other parts of the South where the mosquitoes are expected to be abundant, have a high percentage of households living below the poverty line, according to 2014 U.S. Census data analyzed by the research team.

Lower-income residents can be more exposed to mosquito bites if they live in non-air conditioned houses or have torn or missing screens, enabling

mosquitoes to enter homes more easily. However, *Aedes aegypti* populations tend to thrive in densely populated urban areas, and some of the most impoverished areas are rural.

"The results of this study are a step toward providing information to the broader scientific and public health communities on the highest risk areas for Zika emergence in the United States," said Kacey Ernst, an epidemiologist at the University of Arizona and co-author of the study. "We hope that others will build on this work as more information becomes available. All areas with an environment suitable to the establishment of *Aedes aegypti* should be working to enhance surveillance strategies to monitor *Aedes aegypti* populations and human populations for disease emergence." (PCT Online, March 22, 2016)

<http://www.pctonline.com/article/nsf-zika-virus-map/>

US LEGAL BATTLE CONTINUES OVER DOW'S ENLIST DUO

US environmentalists challenging the registration of Dow AgroSciences' herbicide, Enlist Duo (2,4-D choline + glyphosate), are pressing the US Court of Appeals for the Ninth Circuit to act on their lawsuits. The groups argue that the Agency's ongoing review of the Enlist Duo registration has little relevance to their underlying complaints and say "it would be unjust" for the Court to further delay the case.

In January, the Court rejected the EPA's request to vacate the registration, instead remanding it for further review. The EPA asked the Court to vacate and remand the registration after finding information within a patent application by Dow that had claimed the product had "synergistic weed control properties". The EPA says that its review on remand is focused primarily on whether a 30 ft (9.1 m) downwind in-field buffer would be adequate for protecting endangered plant species and other non-target organisms.

The plaintiffs argue that their complaints, filed in October 2014, have little to do with the "narrow question" of the synergistic effects on non-target plants. They say that their lawsuits are focused on "serious concerns about Enlist Duo's effects on human health and the environment" that the EPA was required to consider under federal pesticide law. The specific complaints include the Agency's alleged refusal to evaluate Enlist Duo's harm to monarch butterflies as well as its alleged failure to consult with federal wildlife agencies as required by the Endangered Species Act. The environmentalists, who filed their opening briefs in October, also argue that the Agency failed to fully consider the potential human health effects from the herbicide.

The EPA's decision on the question of synergistic effects on non-target plants "may have no bearing on the arguments petitioners have already briefed in this Court", the plaintiffs argue in the March 10th filing. "There is therefore no good reason to wait to decide these pending claims."

The plaintiffs also note that the Agency has offered no timetable for its review and the herbicide, intended for use on Dow's genetically modified herbicide-tolerant Enlist maize and soybeans, remains on the market. "There is reason to expect EPA will not act quickly on remand," the environmentalists say. "The Agency is not bound by any specific deadline, and in prior cases EPA failed to act on a remand order for years."

The plaintiffs conclude that they "should not be forced to tolerate ongoing harm to the environment and human health while EPA reconsiders one discrete and unrelated issue on remand, especially when there is no guarantee EPA will conclude proceedings on remand anytime soon".

Both the EPA and Dow oppose the motion, which is now under the consideration of the Court. (Pesticide & Chemical Policy/AGROW, March 17, 2016)

GLYPHOSATE CONCERNS PROMPT US MONARCH SUIT

Environmentalists have sued the US Fish and Wildlife Service (FWS) to force it to make a decision about whether to add monarch butterflies to the federal list of endangered species. Its worries are stoked by perceived impacts from pesticide use on the iconic insect.

The complaint was filed on March 10th in the US District Court for the District of Arizona by the Center for Biological Diversity and the Center for Food Safety. The two organizations say that there is ample evidence that the monarch should be protected under the Endangered Species Act (ESA), highlighting the loss of milkweed across the US.

They contend that the widespread use of glyphosate herbicide and other pesticides on genetically modified crops have devastated the native plant, which is the sole source of food for monarch butterfly larvae. "Glyphosate use with genetically engineered crops is currently the greatest threat to the resiliency, redundancy and prevalence of monarch butterflies in North America," according to the complaint.

Studies show that the monarch has declined some 90% since the mid-1990s and the plaintiffs say that the FWS has not followed through on its pledge to review whether the species should be listed under the ESA.

In late 2014, the agency concluded that a petition filed by the two groups presented "substantial information indicating that listing may be warranted." The FWS noted that the species faces an array of threats far beyond pesticides, including climate change, drought and heat waves, urban sprawl, and logging on their Mexican wintering grounds.

The FWS took comments on its preliminary conclusion until March 2015 but has yet to indicate if it will list the species.

The lawsuit says that the agency has missed clear legal deadlines to make its decision. The ESA requires the FWS to decide whether to list a species within 12 months of launching a review. The plaintiffs note that this "12-month finding" was due to be reported on December 31st 2015.

The lawsuit asks the Court to order the FWS to "comply by a date certain with the ESA's mandatory, nondiscretionary deadline" to make a listing determination. "Compliance with this mandatory deadline is necessary to ensure the continued survival and recovery of the monarch butterfly," according to the complaint.

Listing of the species could have far-reaching impacts, including efforts to restrict the use of GM crops and pesticides to ensure that the insects have adequate habitat across the US, particularly in the farm-heavy Mid-West. But it appears unlikely that federal officials will support such drastic action. The EPA, which would be required to work with the FWS to protect the monarch if it is listed on the ESA, has already rejected a bid to impose restrictions on glyphosate to aid the butterfly. The Agency denied a petition last July that called for new limits on glyphosate applications, concluding that it has yet to determine that the herbicide "causes unreasonable adverse effects" on the monarch.

The suit also comes in the wake of some good news about monarch butterflies. The latest count of monarchs overwintering in Mexico found that their numbers have increased to 150 million from 42 million last year. Researchers with the World Wildlife Fund and Xerces Society say that the rise was expected due to good spring and summer weather conditions in the monarch's US and Canadian breeding areas.

But they cautioned that there remain long-standing concerns about the species' plight. The numbers remain below the 22-year average of 225 million, a figure that is also the five-year goal set last year by the White House Pollinator Protection Task Force. (Pesticide & Chemical Policy/AGROW, March 14, 2016)

HEATER USED TO ELIMINATE BED BUGS CAUSES FIRE AT MOTEL'S STORAGE SHED

Chattanooga firefighters responded to a shed fire on Monday at the Chatt City Suites at 101 E. 20th Street. The shed was located next to the motel, and the flames were threatening to spread to the motel, WRCB reported.

Firefighters had to cut through a chain-link fence to get to the shed. The fire was quickly extinguished. No one was injured and the motel was not damaged.

Employees with the motel told firefighters that they were using a heater in the shed in an attempt to kill bed bugs in motel furniture. Captain David Thompson Jr. said the turnout gear (the coat and pants they wear inside to protect them from the fire) for four firefighters will have to be treated for possible infestation of bedbugs (PCT Online, April 1, 2016) <http://www.pctonline.com/article/bed-bug-hotel-shed-fire>

WELL WISHES TO DR. JACKIE LEE

OSU Pesticide Coordinator and Fruit and Nut Entomologist Dr. Jackie Lee will be leaving Oklahoma State University in April for a position at the University of Arkansas Cooperative Extension Service in Little Rock Arkansas. Dr. Lee came to OSU in the summer of 2013 to fill the position of Pesticide Coordinator/Extension Entomologist.

Dr. Lee will work in the Department of Horticulture working on Extension Horticulture IPM issues.

The OSU PSEP program would like to congratulate Dr. Lee on her new position and wish her good luck in her move to Arkansas.

CEU Meetings

Date: April 6, 2016

Title: OARA Professional Applicator Training

Location: Kingfisher OK

Contact: Tammy Ford-Miller (580) 233-9516

Course #: OK-16-

www.oklahomaaag.com

| CEU's: | Category(s): |
|--------|--------------|
| 3 | 1A |
| 3 | 10 |

ODAFF Approved Online CEU Course Links

Technical Learning College

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

Green Applicator Training

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

All Star Pro Training

www.allstarce.com

Wood Destroying Organism Inspection Course

www.nachi.org/wdocourse.htm

CTN Educational Services Inc

http://ctnedu.com/oklahoma_applicator_enroll.html

Pest Network

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

Univar USA

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

Southwest Farm Press Spray Drift Mgmt

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

SW Farm Press Weed Resistance Mgmt in Cotton

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

Western Farm Press ABC's of MRLs

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

Western Farm Press Biopesticides Effective Use in Pest Management Programs

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

Western Farm Press Principles & Efficient Chemigation

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

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

<http://www.state.ok.us/~okag/cps-ceuhome.htm>

ODAFF Test Information

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

| April | | May | |
|-------|--------|-----|-------|
| 8 | OKC | 5 | Enid |
| 13 | Lawton | 12 | Tulsa |
| 14 | Tulsa | 13 | OKC |
| 22 | OKC | 19 | Altus |
| 28 | Tulsa | 26 | Tulsa |
| | | 27 | OKC |
| | | | |
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| | | | |

- Altus: SW Research & Extension Center
16721 US HWY 283
- Atoka: KIAMICHI TECH CENTER 1301
W Liberty Rd, Seminar Center
- Enid: Garfield County Extension Office,
316 E. Oxford.
- Goodwell: Okla. Panhandle Research &
Extension Center, Rt. 1 Box 86M
- Hobart: Kiowa County Extension Center
Courthouse Annex, 302 N. Lincoln
- Lawton: Great Plains Coliseum,
920 S. Sheridan Road.
- McAlester: Kiamichi Tech Center on
Highway 270 W of HWY 69
- OKC: Arcadia Conservation Education
Building 7201 E 33rd St. Edmond
OK (**New Location**)
- Tulsa: NE Campus of Tulsa Community

Pesticide Safety Education Program