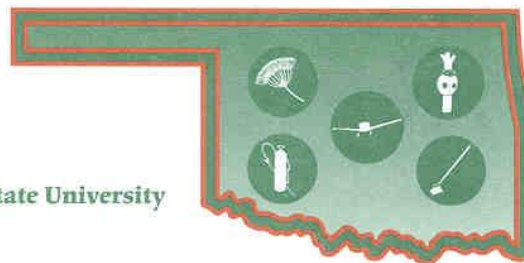


PESTICIDE REPORTS

Division of Agricultural Sciences and Natural Resources • Oklahoma State University

<http://pested.okstate.edu>



December, 2018

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REMINDER RENEW LICENSES AND RECERTIFY

It is that time of year to double check your certifications and business license renewals.

Applicators in categories A Aerial, 1A Ag Plant, 7b Structural, and 10 Demonstration and Research must make sure they have recertified by either CEUs or retested in the appropriate category before December 31st to stay certified.

If you recertified by CEUs remember to pay your \$50 renewal fee to stay certified for the next cycle.

All business licenses for any category should be renewed before December 31, 2018 to avoid delays in 2019. Reminder the license fee doubles to \$200/category if you do not renew by the December 31, 2018 and pay them in 2019.

LAST TEST HELP SESSIONS FOR 2018

The OSU Pesticide Safety Education Program will conduct the last test help workshops for 2018 in December. The workshops will be held December 5th in Oklahoma City and December 13th in Tulsa.

The Tulsa session will be at the Tulsa County Extension Office at 4116 E. 15th. The Oklahoma

City Test help session will at the Oklahoma County Extension Office 2500 NE 63rd.

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!

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

BEYOND THE LABEL: EXPERTS GIVE 5 ADDITIONAL CAUTIONS WITH DICAMBA

Four extension weed specialists (from Purdue University, University of Illinois, and Ohio State University) have released a bulletin with five additional suggestions to reduce off-site movement of dicamba. This is in response to the EPA's label for dicamba use that was released at the end of October.

In addition to the eight label restrictions the EPA detailed in its updated label for dicamba use, [the bulletin](#) provides five additional recommendations, citing, "one can do everything "per the label" but still have offsite movement."

1. Do not spray when the forecast indicates wind gusts will exceed 10 mile per hour. It is impossible to predict when a gust of this magnitude will happen nor how long it will last. Gusts that reach 30 mph can move spray particles and vapor for great distances.
2. Reduce boom heights to the 24-inches above the target height limit specified on the label. Simply reducing the boom height from 48 to 24 inches has been shown to reduce the distance traveled by drift particles by 50%. One of the most effective ways to safely lower the boom height without running the boom into the ground is to reduce sprayer travel speed. Also remember that any travel speed over 15 mph is off-label. The labels also now recommend that travel speeds be reduced to 5 mph when making applications on the field edges.
3. Avoid application when temperature exceeds 80 degrees. Assuming that these dicamba products have some potential for volatility, the risk of this occurring increases with temperature.
4. Consider applying dicamba only preplant, preemergence, or very early postemergence. Over 90% of the offsite movement complaints resulted from postemergence applications. Our assumption is that applications earlier in spring will have less likelihood to cause problems even where dicamba moves, due to the absence in many cases of any developed vegetation to injure. Temperatures are also likely to be lower when applied preplant/preemergence versus postemergence, possibly reducing the risk of movement via volatility.
5. Have conversations with neighbors to know what crops and technologies are being planted around Xtend soybean fields. Many offsite movement cases in 2018 occurred where neighbors planted Xtend and non-Xtend soybean adjacent to each other. Knowing what sensitive crops are in the

vicinity of your Xtend fields will enable better decisionmaking about use of dicamba in a given field.

[Click here for the full bulletin](https://www.agprofessional.com/article/beyond-label-experts-give-5-additional-cautions-dicamba)(AGPRO November 13, 2018)
<https://www.agprofessional.com/article/beyond-label-experts-give-5-additional-cautions-dicamba>

NO TROPICAL VACATION

At NPMA PestWorld 2017 in Baltimore, researchers from the University of Florida discussed how consumers and PMPs, especially those living and working in warmer regions of the United States, now may have to deal with two species of bed bugs. University of Florida researchers recently discovered tropical bed bugs (*Cimex hemipterus*) on the eastern coast of Florida. At PestWorld, they reviewed how these pests could lead to changes in how humans deal with bed bugs, including how PCOs manage and control them.

HISTORY. The common and tropical bed bugs are the two primary bed bug species that feed on humans, and both are distributed globally. Tropical bed bugs, however, prefer warmer climates. Documentation from the 1960s showed that tropical bed bugs were almost exclusively found in areas 30 degrees north and south of the equator.

“But then again, most of this was done before we heated and air conditioned buildings,” said Brittany Campbell, staff entomologist for the National Pest Management Association (NPMA) and University of Florida doctoral student. “So, we have no idea how far the spread of the tropical bed bug will be.”

Earlier, in the 1930s and ’40s, the first record of tropical bed bugs in the United States occurred when entomology professors from the University of Florida had students studying entomology collect bed bug samples. The tropical bed bugs collected came from five different areas throughout Florida. “We know we had tropical bed bugs back then; what we don’t know now is if they disappeared completely,” said Campbell.

While tropical bed bugs went undetected for more than 60 years, the pests were rediscovered in Florida in 2015 by the University of Florida’s research team.

RECURRENCE. In 2015, Dr. Phil Koehler’s team received a sample of bed bugs at their University of Florida lab. “Instantly I knew these bugs looked different than the common bed bug I was accustomed to,” said Campbell.

The sample came from a house located in Brevard County. Upon closer examination, the researchers realized they had a sample of tropical bed bugs, a species that hadn’t been seen for decades. “We wanted to share this to raise awareness of this new bed bug species that had been reintroduced into the state of Florida,” said Campbell, who began writing a paper on the subject in 2016.

She contacted pest control firms operating throughout Florida to see if they had any recent experiences with tropical bed bugs. She received around 50 samples of bed bugs from Florida-based pest control companies. After examining them all, the research group determined that only the original sample from Brevard County contained tropical bed bugs.

During this time, Campbell’s research and the revelation of a new bed bug species began to receive national media attention. “It wasn’t surprising, because as soon as you start talking about bed bugs and a new invasive species that can be reintroduced, or potentially was already in small populations in Florida, it gets a lot of attention because bed bugs tend to freak people out,” said Campbell. “There were a lot of crazy stories that said they could spread more quickly and reproduce at really fast rates; there were some crazy numbers out there. But that’s actually not something to be alarmed about. We don’t really see this species reproducing any more quickly than any other species.”

However, Campbell’s research revealed that tropical bed bugs could potentially spread to parts of Texas, Louisiana and all of Florida. All these areas fall within 20 to 30 degrees north of the equator. “I don’t think it’s something that we should

necessarily be alarmed about,” said Campbell. “I just want to make (PMPs) aware that there is this species. Currently, they don’t seem to be dominant in the state of Florida.”

STUDY. After receiving the sample of tropical bed bugs, Koehler’s team visited the home where the pests were found. The team took several live samples back to their lab for testing.

“We wanted to establish a tropical bed bug colony, so we could begin to conduct research on this species,” said Campbell. “In the United States, we really haven’t done a lot of research. In other tropical areas, some research has been done with tropical bed bugs, but there’s still a lot of unknown research about this species.”

Campbell and other team members collected eight bed bugs that day and began growing a colony of tropical bed bugs in the lab. “I would say, by now, we have thousands of tropical bed bugs in our lab at the University of Florida,” she said.

One of the primary goals of breeding this colony was to determine whether tropical bed bugs could hybridize with common bed bugs. But first, Campbell wanted to devise an easy way to tell the difference between the two species.

While one major difference is that tropical bed bugs are often darker in color, Campbell said this couldn’t be a true identifier because all bed bugs become darker in color after feeding.

“The body part you’re really going to focus on is the pronotum,” Campbell said. The pronotum is located behind the head and can be roughly referred to as the bed bug’s “neck.” Campbell notes the common bed bug has a much more pronounced and U-shaped pronotum than the tropical bed bug. However, she added that unless you view these bed bugs under a microscope, you would have a hard time telling them apart.

Campbell then took measurements of each species, looking for a measurement that would be different enough to act as a distinguishing characteristic. She discovered that tropical bed bugs are often smaller in size for both males and females compared to the

common species. The pronotum of tropical bed bugs is also much smaller in almost every life cycle stage.

Once the size differences were determined, the team went back to see if tropical and common bed bugs could breed and create a hybrid species. In their University of Florida lab, they attempted to mate the two. Campbell said that hasn’t happened yet, however, and it appears that they may never be able to because of genetic variances between the species.

“The tropical bed bug species that we have, if we look at their DNA, they are very different,” said Campbell. “There are basically 47 different steps genetically between the different species, showing that these are two entirely different species.”

TREATMENT OPTIONS. Campbell’s next step was to find a way to control and eliminate tropical bed bugs using insect growth regulators (IGRs). She decided to test the bed bugs against two different chitin synthesis inhibitors (CSIs), which affect the molting process and the formation of chitin in the exoskeleton. She tested novaluron and lufenuron by applying a small amount to the abdomen of individual tropical bed bugs.

“It actually worked way better than I ever thought it would,” said Campbell. “One of the effects was that the bed bugs would outright die. Their exoskeletons would become black and crusty. And sometimes, in extreme cases, their guts would explode out of their abdomens.”

She added, “Another result that I saw was the sublethal effect. Sometimes the CSIs would not outright kill the bed bugs, but they would prevent the bed bugs from being able to walk well. The bed bugs that were treated with the CSI could not even grip a surface. If a bed bug can’t walk in someone’s home, they can’t go host searching and ultimately they can’t reach a host to take a blood meal. That’s going to be just as important as killing these bed bugs.”

TREATMENT VS. PREVENTION. With the reemergence of the tropical bed bug, Koehler said PCOs need to make a clear distinction between bed bug guarantees and warranties. He said companies

should offer two different services: one for bed bug elimination, which would come with a guarantee that your service will eliminate bed bugs for a set period of time, and another prevention service with a legally binding warranty saying that if re-infestation occurs over a set period of time, the company will compensate the customer with no cost to the buyer.

“I’m kind of challenging the industry to take a look at two different services instead of one, which is not just an elimination service, but also a prevention service,” Koehler said. “Each service would use different methods, be invoiced separately or be invoiced together as a package when you do the process.”

Koehler compared bed bug IPM to a food pyramid. The top features food that should be eaten minimally, while the bottom contains what should be eaten most often. “Bed bug education and prevention should be at the bottom of the pyramid and treatment or elimination of bed bugs from people’s homes should be the least amount of work that you do,” he said. “Right now, the pyramid is inverted. Most of what you do is treatment and elimination and there’s very little prevention that’s part of your program. And we’ve been backwards on that for most of the bed bug work that’s been done in the past 10 years or so.”

He added, “You have to remember that times are changing. Bed bug IPM can be put together for your company to really profit from being able to sell a service to all of your customers, not just the ones that need a treatment or elimination. It’s going to be based on prevention.” (PCT Online, November 16, 2018) <https://www.pctonline.com/article/tropical-bed-bugs-no-vacation/>

STATES UNTANGLE DICAMBA RULES

Just how complex will dicamba use be in 2019?

So complex that the three new dicamba labels released by EPA last week are each around 40

pages long and accompanied by nearly 200 pages of documents detailing the herbicides' registration requirements and their potential impacts on the general population, farmers and endangered species.

States are working overtime to interpret the new XtendiMax, Engenia and FeXapan labels and struggling to take the proper first steps to prepare for 2019.

Indiana's pesticide regulators decided to drop all state-mandated dicamba training for its applicators in an effort to cut down on the state dollars and resources devoted to dicamba. Illinois agencies are knocking on EPA's door, asking for clarification on the new applicator requirements, which could mean up to 5,000 applicators in the state are not qualified to apply these herbicides in 2019. And the Arkansas State Plant Board has voted to consider allowing dicamba use in 2019 with a June 15 cut-off.

All are driven by a ticking clock -- states have only a few short months to prepare thousands of applicators and farmers for the 2019 spray season -- and the promise of a heavy workload ahead.

"Last year, we started dicamba training on Nov. 4," said Jean Payne, president of the Illinois Fertilizer and Chemical Association (IFCA). "We already had everything lined up ready to go, and it took us all winter doing 10 classes every week to get 11,000 people trained. And those 11,000 people are out there again, waiting, and we're behind."

INDIANA LOOKS TO CONSERVE STATE RESOURCES

Indiana's Office of the State Chemist spent roughly \$1.2 million beyond their normal budget dealing with dicamba in 2018, between training applicators, responding to injury complaints, doing lab analysis, talking to media and developing policy and educational materials, said Dave Scott, pesticide program administrator for the Office of Indiana State Chemist. That amount doesn't cover the expenses of Purdue's Cooperative Extension service, which helped train applicators and respond to complaints, he added.

"It took up three-quarters of almost everyone's time here," he said. "We've never spent three-quarters of our time on any one product ever, until dicamba."

As a result, the agency decided to end the state-led dicamba training supplied to all Indiana dicamba applicators last year in an effort to reduce off-target injury problems.

"Our hope was if we provided some unvarnished training that was completely consistent for all three products, and if we were very specific about how to interpret the restrictions, that additional training would significantly reduce the number of misuse complaints that were filed," Scott said. "But that didn't happen."

Instead, state investigators saw dicamba injury complaints increase slightly in Indiana, from 133 in 2017 to 141 in 2018.

"I was really satisfied with our training, so I don't think it was a training deficiency or training delivery or availability issue," Scott said. "It seems more like there may be some inherent challenges to the use of these products."

So, for 2019, Indiana applicators seeking their mandatory annual dicamba training will have to turn to the registrants of the three herbicides -- BASF, Bayer and Corteva, Scott said.

In the meantime, Indiana's Pesticide Review Board will meet and try to decide what additional restrictions might help reduce off-target dicamba injury next year. Their options include changing enforcement strategies for applicators who cause off-target pesticide injury or adding 24(c) label restrictions -- if EPA permits this practice (see story here: <https://www.dtnpf.com/...>).

Scott said the new labels still have much of the same vague language that made them so hard to enforce for state regulators in 2018. For example, there is no definition for "neighboring" or "adjacent" fields for the prohibitions on spraying when wind is blowing toward a sensitive crop -- even though state regulators asked EPA to pick a specific distance.

Nor are many of the restrictions -- such as not spraying during a temperature inversion or 45 days after soybean planting -- any more enforceable, Scott said.

"There is no way to verify these," he said. "These labels are still fraught with enforceability challenges."

In addition to interpreting and enforcing the new 2019 labels, Scott estimates it will take several more months to finish processing the 2018 complaints -- possibly up until dicamba spraying begins again in 2019.

"That's what happened last year, after all," he said.

ILLINOIS EYES CERTIFICATION REQUIREMENTS ANXIOUSLY

The Illinois Fertilizer and Chemical Association is seeking clarification from EPA on the agency's statement that "only certified applicators may apply dicamba over the top" and not those "working under the supervision of a certified applicator."

Every state has its own system of certification, but in Illinois and many other states, each commercial retailer facility has a single commercially certified applicator who oversees a team of licensed -- but not necessarily certified -- spray operators, IFCA's Payne said.

"We are in limbo," Payne said, as the state waits to hear if spray operators that have already passed a standard state pesticide competency exam could be considered "certified applicators" permitted to apply dicamba.

"If not, we've got 5,000 people to put through the state commercial applicator certification program before we even start worrying about the requirement for dicamba-specific training," she said.

The certification requirement will also apply to the employees of farmers with private applicator licenses, and possibly those who mix or load dicamba on retail or farm operations.

"That's a whole other suite of people -- people who work in chemical sheds and do the mixing or haul it out to the field to load it," Payne said. "If they truly have to go through a commercial certification testing, we could have a real revolt on our hands with employees in the ag retail industry."

Both Payne and Scott expressed skepticism that changes to applicator certifications will have any impact on off-target dicamba injury.

"I think spray operators have been unfairly characterized as not knowing what they're doing when there are clearly issues beyond their control with regard to the [postemergence] application of dicamba," Payne said. "Illinois ended up with 330 dicamba complaints in 2018 and 246 in 2017. Prior to that, since 1989, we have had less than 100 ag-related pesticide complaints for almost 30 years."

ARKANSAS MOVES AHEAD

In a sharp change from last year, the Arkansas State Plant Board has tentatively voted to allow postemergence use of the three dicamba herbicides in the state in 2019. The board agreed to advance a farmer-led rulemaking petition that would allow dicamba use with a June 15 cutoff date and special permits required for any applications after that date.

The petition also asked for a 1/4-mile downwind field buffer for dicamba applications and a 1-mile buffer around certified organic farms.

The Plant Board's Pesticide Committee will meet on Nov. 26 to "further refine usage restrictions" based on the petition, the Arkansas Agriculture Department said in a press release. "The Pesticide Committee will present its recommendation for use of dicamba during the 2019 crop season at the Plant Board's next meeting, scheduled for 1 p.m. on Thursday, Dec. 6," the release stated.

Last year, the Plant Board banned over-the-top use of dicamba in the state from April 16 to Oct. 31, 2018, after the state received nearly 1,000 complaints of off-target dicamba injury to soybeans and other vegetation in 2017. That complaint load dropped substantially this year, but the Plant Board

still received around 200 complaints of dicamba-injured plants and trees this past summer.

(Progressive Farmer November 8, 2018)

<https://www.dtnpf.com/agriculture/web/ag/news/crops/article/2018/11/08/states-struggle-interpret-react-new-2>

TRUMP ADMINISTRATION REFUSES TO BAN WILDLIFE-KILLING M-44 'CYANIDE BOMBS'

The U.S. Environmental Protection Agency (EPA) has refused to ban M-44s, commonly known as cyanide bombs, which cause agonizing deaths for thousands of animals every year.

The agency's decision comes in response to a 2017 petition authored by the Center for Biological Diversity and WildEarth Guardians and signed by several other wildlife conservation groups.

The devices are used to kill coyotes, foxes and wild dogs, purportedly to address conflicts with livestock. But they also pose serious risks of accidental injury and death for people, family pets and imperiled wildlife.

"Cyanide traps are indiscriminate killers that just can't be used safely," said Collette Adkins, an attorney and biologist at the Center for Biological Diversity. "We'll keep fighting for a permanent nationwide ban, which is the only way to protect people, pets and imperiled wildlife from the EPA's poison."

The EPA has registered sodium cyanide for use in M-44s by Wildlife Services—the secretive U.S. Department of Agriculture wildlife-killing program—as well as by certain state agencies in South Dakota, Montana, Wyoming, New Mexico and Texas.

The devices spray deadly sodium cyanide into the mouths of unsuspecting coyotes, foxes and other carnivores lured by smelly bait. Anything or anyone that pulls on the baited M-44 device can be killed or severely injured by the deadly spray.

M-44s temporarily blinded a child and killed three family dogs in two separate incidents in Idaho and Wyoming in 2017. A wolf was also accidentally killed by an M-44 set in Oregon last year. Idaho currently has a moratorium on M-44 use on public lands, resulting from the tragedies.

"The government continues to prioritize the minority anti-wildlife ranching industry over making public lands safe for people, imperiled wildlife and companion animals," said Bethany Cotton, wildlife program director for WildEarth Guardians. "These dangerous, indiscriminate devices have absolutely no place on public lands, especially given no evidence exists that they actually reduce conflict."

According to Wildlife Services' own data, M-44s killed 13,232 animals, mostly coyotes and foxes, in 2017. Of these more than 200 deaths were nontarget animals, including a wolf, family dogs, opossums, raccoons, ravens and skunks.

Unfortunately these numbers are likely a significant undercount of the true death toll, as Wildlife Services is notorious for poor data collection and an entrenched "shoot, shovel, shut up" mentality. (EcoWatch, November 26, 2018)

<https://www.ecowatch.com/trump-administration-m-44-cyanide-bombs-2621562126.html>

LEGAL BATTLE RAGES ON OVER US EPA'S APPROVAL OF MONSANTO'S DICAMBA HERBICIDE

Bayer-owned Monsanto is urging a federal appeals court to toss out a lawsuit challenging the US EPA's approval of its dicamba herbicide. It argues that the

agency's new registration renders the litigation pointless.

The company contends that there are clear differences between the 2018 registration and the 2016 registration targeted by the lawsuit and says that environmentalists who filed the original litigation are inaccurately characterizing the EPA's actions.

"Once those mischaracterizations are debunked, it is apparent that this case is moot," the Bayer legacy business says in its November 20th filing with the US Court of Appeals for the Ninth Circuit.

The underlying lawsuit aimed to reverse the EPA's 2016 approval of Monsanto's XtendiMax, a dicamba-based herbicide registered for use on soybeans and cotton that have been genetically modified to tolerate the potent pesticide. The complaint - filed by the Center for Food Safety (CFS) and other environmental groups - alleges that the EPA had failed to fully consider the environmental impacts of the new herbicide and had not assessed the potential harms to endangered species.

The 2016 registration was set to expire in November 2018. Last month, the EPA issued a new, two-year approval of the Bayer business's herbicide that includes additional restrictions on use intended to mitigate concerns about potential harm from dicamba drift to non-target crops.

A three-judge panel of the Ninth Circuit heard oral arguments in August and appeared curious about the potential for the case to become moot but did not signal how it would proceed if the EPA had issued a new registration.

The CFS-led coalition says that the court should still rule on their complaint, arguing that the new registration relies on the same legal reasoning that made the earlier approvals "fatally flawed".

The Bayer business and the EPA contend that the new registration is based on a completely different record and say that the complaint should be dismissed as the 2016 registration essentially no longer exists.

"In granting the 2018 registration, EPA examined extensive new evidence bearing directly on the gravamen of petitioners' concerns," according to Monsanto.

The company says that while the agency had evaluated only two dicamba spray drift and volatility field trials for the 2016 registration, it has since considered 16 new field trials from multiple sources, including academics and registrants.

The EPA evaluated 2017 and 2018 incident data and feedback from state agencies, academics, growers, farm groups and NGOs and updated the environmental, human health and endangered species assessments for the 2018 registration, Monsanto says in its brief with the Court.

The new registration imposes "substantial new conditions of use", the Bayer business adds, noting revised buffer zones, limits on the number of applications and restrictions on when the herbicide could be sprayed.

"EPA has weighed the benefits and costs and determined that the public interest is advanced by the 2018 registration and that, with the new conditions imposed, the approved uses of this herbicide will not affect listed species or their habitats," Monsanto concludes. "Petitioners' request that this Court override that decision before any court has examined its merits is irresponsible." (Pesticide & Chemical Policy/AGROW, November 26, 2018)

MISSOURI FARMER CHARGED WITH ILLEGAL USE OF DICAMBA

A southeast Missouri farmer has been indicted on federal charges of illegally applying dicamba and damaging crops in neighboring fields.

A 53-count federal indictment was announced Tuesday against Bobby David Lowrey, 51, of Parma. He is accused of illegally applying dicamba on his cotton and soybean crops outside of Environmental Protection Agency guidelines, and lying to investigators when confronted about it.

Lowrey does not have a listed attorney who can speak on his behalf. A phone number for his home is no longer in service.

"Although weed killers like Dicamba have been around for decades, it is critical that applicators follow manufacturer instructions when applying them," EPA Special Agent in Charge Jeffrey Martinez said in a statement. "The misuse of this product has resulted in significant crop damage at neighboring farms."

The indictment said crops planted by Lowrey in 2016, which cover 6,700 acres, were modified to be resistant to dicamba. Federal prosecutors say Lowrey didn't follow the rules and then lied when the Missouri Department of Agriculture investigated after neighboring farmers reported crop damage. The indictment alleges Lowrey applied dicamba to cotton after planting and over the top on soybeans and then presented false spray records to investigators.

Lowrey faces 49 counts of misapplication of a pesticide, three counts of obstruction of justice, and one count of making a false statement. He could face up to 20 years in prison and a \$250,000 fine if convicted. (AGPRO, November 21, 2018)
<https://www.agprofessional.com/article/missouri-farmer-charged-illegal-use-dicamba>

TRAVEL COMPANIONS

Bed bugs just don't "drop in" or appear out of thin air in a home or place of business; they are introduced to living and work spaces.

One of the most common ways people pick up and transport bed bugs is when they travel. And it is not the stereotypical "flea bag" hotel that most would

assume is infested with bed bugs. These nasty blood-feeders can be found in budget motels and in presidential suites of five-star hotels.

McNeely Pest Control in Winston-Salem, N.C., takes customer education seriously and so do its clients.

“We see a very keen interest from customers in learning more about how they can prevent bed bugs from infesting their home or business,” says McNeely Pest Control Vice-President Frank Fowler. “A lot of the interest comes from a previous experience with bed bugs because once you’ve had them, you don’t want them again.”

The company shares the following checklist with its residential and commercial clients to help lessen the chance they will bring bed bugs back to their home or office.

- There are no socioeconomic boundaries for the presence of bed bugs.
- Before leaving home, place multiple large size plastic bags in laundry area and purchase several “No Pest Strips” (available at home improvement stores). Also have change of clothes set in laundry.
- Enjoy your travel and avoid unpacking and placing your clothing in dressers and nightstands, if possible.
- Upon your return home, DO NOT take your luggage and clothing into your bedroom to unpack.
- Take luggage directly to the laundry room. Clothing that can be washed – place in the dryer on hot cycle for 20-30 minutes, then wash and dry. If you have clothing to dry clean, place that clothing in one of your large plastic bags and seal to deliver to dry cleaners. If there is clothing or items that you do not wash you may place clothing in dryer on hot cycle for 20-30 minutes. An alternative to heating items in dryer would be to place the items in a chest freezer for approximately one week and then remove. Change from travel clothing into clothing that was left in laundry room.

- Following handling of clothing place luggage in large plastic bags and place a “no pest strip” in each bag and seal bags. Leave luggage in bag for a minimum of one week prior to removal, airing out, and then storing. Always be sure to read and follow label instructions.

Following these procedures lessens the likelihood of your customers bringing bed bugs into a home following a vacation or business trip.

(PCT Online, November 19, 2018)

<https://www.pctonline.com/article/travel-companions-bed-bugs/>

ROOTWORM RESISTANCE TO BT PYRAMIDS IS ON THE RISE - - WITH NO RELIEF IN SIGHT

Few corn hybrids are fully protected from the western corn rootworm anymore -- not even pyramided Bt corn hybrids.

In October, Corteva Agriscience informed EPA that the company has confirmed resistance to Cry34/35Ab1 (Herculex RW) in rootworm populations in the northeastern Iowa county of Delaware.

Although the company called it the "first case" of such resistance, Iowa State University entomologist Aaron Gassmann documented low levels of rootworm resistance to this same trait in Iowa in 2016. At the time, he called it "an early warning" for industry and farmers to improve their stewardship of the technology -- or risk losing it soon.

Now, two years later, with no major changes to Bt management by farmers or industry, the problem has deepened.

Cry34/35Ab1 is the underpinning of many popular pyramided Bt corn hybrids, which offer multiple belowground Bt traits targeting the rootworm. Because the other Bt traits in those pyramids,

namely Cry3Bb1 and mCry3A, are already compromised by resistant rootworm populations, Cry34/35Ab1 has been the only effective Bt trait remaining in many cornfields in intensive corn-producing states like Iowa for several years now.

"There is so much pressure being put on that trait in Iowa," said Evan Sivesind, program manager for the Iowa Pest Resistance Management Program (IPRMP). "It is really what is being leaned on by anyone who grows Bt corn here."

This latest resistance report is unlikely to be the last, he added. "Evolution is going to proceed," he said. "That's why managing Bt resistance is not about eliminating resistance, it's about minimizing it as much as possible to preserve current management options as long as possible."

For years, industry, government and academic scientists have promoted the same group of resistance prevention strategies to achieve this: crop rotation, trait rotation and rotation to non-Bt hybrids, with use of a soil insecticide.

But there is little evidence that growers are adopting them, Sivesind acknowledged. It is the goal of IPRMP to figure out why and change that dynamic - through education, but also through addressing the economic and emotional hurdles that come with changing a crop production practice, he said.

"It's hard to make people do any long-term management that comes with increased costs upfront," Sivesind said. "It's like ignoring a roof leak -- it will save you money this year, but it will cost you more three years down the road. We need better strategies for making adoption of these best management practices more feasible for growers, especially in tough economic times."

SAME SONG, DIFFERENT TRAITS

Cry34/35Ab1 showed the first official signs of weakening a few years ago, and Gassmann documented partial resistance to it in some Iowa fields in 2016

See the DTN story here: <https://www.dtnpf.com/...>

The trait is usually offered in pyramids like SmartStax, QROME, Intrasect Xtreme, AcreMax Xtreme and Agrisure 3122, along with another Bt rootworm trait, usually Cry3Bb1 or mCry3A.

Since resistance to Cry3Bb1 and mCry3A has been documented in the Corn Belt for nearly a decade, many rootworm populations are only controlled by the Cry34/35Ab1 trait. And because the stack contains multiple belowground Bt traits, the refuge component is often only 5%, as compared to 20% required for single Bt hybrids used in the past, which puts additional selection pressure on Cry34/35Ab1.

Syngenta's pyramided Duracade hybrids, which contain eCry3.1Ab, paired with mCry3A, are running into similar problems.

Two years ago, scientists from Iowa and Minnesota documented field resistance to eCry3.1Ab, likely because of its similarity to other Cry proteins on the market, rather than overuse. Gassmann and other researchers have found that rootworm populations with resistance to Cry3Bb1 and mCry3A are likely to be already resistant to eCry3.1Ab, even if they have never encountered the trait before.

THE BATTLE TO CHANGE MANAGEMENT

Most growers know the practices that can help slow resistant rootworm populations from taking over, Sivesind said.

They can rotate to a non-host crop, usually soybeans, switch between different rootworm Bt traits, or better yet -- switch to a non-Bt hybrid and use a soil insecticide.

The problem is those options usually appear economically unappealing or downright difficult to adopt to growers, Sivesind said.

Commodity prices and market demand often means corn pencils out best, year after year, in parts of Iowa, leading to continuous corn production.

"We can say grow oats, but if there's no good place for them to sell oats, that's no help," Sivesind noted.

Switching to different traits is also tricky since licensing agreements allow different seed companies to use the same four belowground Bt traits labeled under different brand names and numbers.

Michigan State University's Handy Bt Trait table can help growers figure out which traits their hybrids actually have and what they do:

<https://www.texasinsects.org/...>

Finally, switching to a non-Bt corn hybrid and using soil insecticide can also be difficult. Many growers no longer have the equipment needed to add soil insecticides during planting. And although he has heard anecdotal reports of growers buying and using more soil insecticides, there is no way to be sure they aren't just using them on top of Bt hybrids -- which is not a recommended resistance management practice, Sivesind said.

Nor are non-Bt corn hybrids of the same genetic caliber always readily available to growers each year. For seed companies, the process of turning out new, un-traited elite hybrids takes time and persistence.

"These are large companies and this is a multi-year process to decide on new hybrids, contract with growers to grow them, produce them and sell them," Sivesind said.

Iowa Pest Resistance Management Program (IPRMP) is hoping to knock down some of these barriers in the state's farming communities. The group, which is funded by state commodity groups and industry, quizzed Iowa corn growers on their Bt use and decision making this year via statewide surveys. (IPRMP is also tackling weed resistance and the growing phenomenon of soybean aphids resistant to pyrethroids.)

Sivesind said he hopes the latest news on resistance to Cry34/35Ab1 can serve as a "wake up call" to growers that Bt rootworm technology may not last as long as they need it to -- even if it seems to be working for the moment.

"We need to slow this down as much as possible and give industry five to ten years buffer to develop new traits," he said. "The worst thing will be if [Bt pyramids] burn out in the next couple of years, and there is a long gap with no new options available on the market."

"But it's hard to get people to change something that's working," he added. "And that's what we need to do -- fix things before they break. And that has to become the usual decision-making process, to work in diverse practices, rather just pushing on the same one." (Progressive Farmer, November 15, 2018)

<https://www.dtnpf.com/agriculture/web/ag/news/crops/article/2018/11/15/rootworm-resistance-bt-pyramids-rise-2>

OSU PESTICIDE EDUCATION TWITTER ACCOUNT

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

This will be a platform to communicate information that occurs between the releases of the monthly newsletter.

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

CEU Meetings

Date: December 4-5, 2018

Title: Winfield United 2018 Winter Conference

Location: Renaissance Waterford Hotel OKC

Contact: Dennis Christie (405) 203-1751

CEU's: Category(s):
4 1A

Date: December 4, 2018

Title: Winfield CEU Meeting

Location: Overton Convention Center Lubbock TX

Contact: Martyn Hafley (817) 313-4416

www.winfieldacademy.com

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

Date: December 5, 2018

Title: Winfield CEU Meeting

Location: MPEC Center Wichita Falls TX

Contact: Martyn Hafley (817) 313-4416

www.winfieldacademy.com

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

Date: December 5, 2018

Title: KPCA/MPMA Winter Conference

Location: Stoney Creek Hotel & Conference Center

Independence MO

Contact: Spencer Duncan (785) 271-9220

www.kpcapestworld.com

CEU's: Category(s):
7 7B

Date: January 9, 2019

Title: 2019 Annual Oklahoma-Arkansas Turfgrass Short Course

Location: OSU Botanic Garden Education Center Stillwater OK

Contact: Dennis Martin (405) 744-5419

CEU's: Category(s):
6 1A
6 10

Date: January 21-23, 2019

Title: 2019 OAAA Conference and Tradeshow

Location: Embassy Suites Norman OK

Contact: Sandy Wells (405) 341-3548

CEU's: Category(s):
4 A
6 1A
3 2
3 3A
3 5
3 6
6 10

Date: January 23-24, 2019

Title: Red River Crops Conference

Location: Childress Event Center Childress TX

Contact: Gary Strickland (580) 477-7962

CEU's: Category(s):
4 1A
4 10

ODAFF Approved Online CEU Course Links

PestED.com

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

CEU School

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

Technical Learning College

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

Green Applicator Training

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

All Star Pro Training

www.allstarce.com

Wood Destroying Organism Inspection Course

www.nachi.org/wdocourse.htm

CTN Educational Services Inc

http://ctnedu.com/oklahoma_applicator_enroll.html

Pest Network

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

Univar USA

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

Southwest Farm Press Spray Drift Mgmt

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

SW Farm Press Weed Resistance Mgmt in Cotton

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

Western Farm Press ABC's of MRLs

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

Western Farm Press Biopesticides Effective Use in Pest Management Programs

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

Western Farm Press Principles & Efficient Chemigation

<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 December are as follows:

December				
3	OKC			
4	Goodwell			
6	Tulsa			
10	OKC			
12	Lawton			
13	Enid			
17	OKC			
20	Tulsa			

Altus: SW Research & Extension Center
16721 US HWY 283

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

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

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

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

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

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

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

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

**Pesticide Safety
Education Program**