

# PESTICIDE REPORTS

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



January, 2017

CHEM

- 1 NEWSLETTER RENEWAL
- 1 2017 TEST HELP SESSIONS
- 2 EPA REQUIRES STRONGER STANDARDS FOR APPLYING THE RISKIEST PESTICIDES
- 3 EPA TAKES ACTION TO PREVENT POISONINGS FROM HERBICIDE
- 4 EPA PROHIBITS 72 INERT INGREDIENTS FROM USE IN PESTICIDES
- 4 TDA ISSUES STATEMENT ON AMARILLO PESTICIDE INCIDENT
- 5 EPA REJECTS REQUEST TO DELAY PESTICIDE SAFETY RULE
- 6 ADVISORY PANEL DIVIDED OVER US EPA GLYPHOSATE ASSESSMENT
- 8 ANTS COMMUNICATE VIA MOUTH-TO-MOUTH FLUID EXCHANGE
- 9 COMMUNITY-WIDE IPM CAN CONQUER COCKROACHES IN APARTMENTS
- 12 ENVIROS PRESS US EPA ON PESTICIDE MIXTURES
- 13 CEU MEETINGS
- 14 ONLINE CEU LINKS
- 14 ODAFF TEST SESSION INFORMATION
- 15 Renewal Form

## NEWSLETTER RENEWAL

It is time to renew your subscription to the *Pesticide Reports* newsletter. To do so, complete the instructions at the end of this edition. Either e-mail or mail your renewal to us. If you do not respond we will have to drop you from the mailing list.

**OSU Extension personnel are automatically renewed and do not have to send back the renewal form.**

## 2017 TEST HELP SESSIONS

The OSU Pesticide Safety Education Program will conduct the first test help sessions for 2017 in late January and the first of February. The workshops will be held January 31<sup>st</sup> in Tulsa and February 1<sup>st</sup> in Oklahoma City.

The Tulsa session will be at the Tulsa County Extension Office at 4116 E. 15<sup>th</sup>. **The Oklahoma City Test help session will be in a new location 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 405-744-5385.

**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 2017. Please go to the website below for the 2017 dates.

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

**EPA REQUIRES STRONGER STANDARDS FOR APPLYING THE RISKIEST PESTICIDES**

Today, the U.S. Environmental Protection Agency (EPA) is finalizing standards for applicators who apply restricted-use pesticides that are not available for purchase by the general public, and require special handling.

“We are committed to keeping our communities safe, protecting our environment and protecting workers and their families,” said Jim Jones, EPA Assistant Administrator for the Office of Chemical Safety and Pollution Prevention. “By improving

training and certification, those who apply these restricted use pesticides will have better knowledge and ability to use these pesticides safely.”

Today's action will reduce the likelihood of harm from the misapplication because the pesticides may only be applied by a certified applicator or someone working under their direct supervision. EPA's stricter standards would require all people who are certified to apply restricted use pesticides to be at least 18 years of age. These certifications must be renewed every five years.

EPA is requiring specialized licensing for certain methods such as fumigation and aerial application that can pose greater risks if not conducted properly. For further protection, those working under the supervision of certified applicators will now receive training to use pesticides safely and to protect their families from “take-home” pesticide exposure.

EPA expects the benefits of this rule to include fewer acute pesticide incidents to people, reduced chronic exposure and reduced incidents of ecological harm from pesticide use.

States and Tribes with an EPA-approved program may issue licenses to pesticide applicators who can demonstrate the ability to use these products safely.

The final action also updates requirements for state programs and for applicators obtaining licenses. Many states already have in place some of the stronger requirements of today's action.

The final rule includes flexibility for states to continue portions of their existing programs that are equivalent to the revised rule. EPA will work with states to review and approve updated certification plans.

Learn more: <https://www.epa.gov/pesticide-worker-safety/revised-certification-standards-pesticide-applicators>

(EPA, December 12, 2016)

<https://www.epa.gov/pesticides/epa-requires-stronger-standards-applying-riskiest-pesticides>

## **EPA TAKES ACTION TO PREVENT POISONINGS FROM HERBICIDE**

The U.S. Environmental Protection Agency (EPA) is finalizing safety measures to stop poisonings caused by ingestion of the herbicide paraquat, which can also cause severe injuries or death from skin or eye exposure.

Since 2000, there have been 17 deaths – three involving children – caused by accidental ingestion of paraquat. These cases have resulted from the pesticide being illegally transferred to beverage containers and later mistaken for a drink and consumed. A single sip can be fatal. To prevent these tragedies, EPA is requiring:

- new closed-system packaging designed to make it impossible to transfer or remove the pesticide except directly into the proper application equipment;
- special training for certified applicators who use paraquat to emphasize that the chemical must not be transferred to or stored in improper containers; and
- changes to the pesticide label and warning materials to highlight the toxicity and risks associated with paraquat.

In addition to the deaths by accidental ingestion, since 2000 there have been three deaths and many severe injuries caused by the pesticide getting onto the skin or into the eyes of those working with the herbicide. To reduce exposure to workers who mix, load and apply paraquat, EPA is restricting the use of paraquat to certified pesticide applicators only.

Uncertified individuals working under the supervision of a certified applicator will be prohibited from using paraquat.

Paraquat is one of the most widely used herbicides in the U.S. for the control of weeds in many agricultural and non-agricultural settings and is also used as a defoliant on crops such as cotton prior to harvest.

EPA proposed similar measures last March and took public comment.

Actions on specific pesticides are one way that EPA is protecting workers from pesticide exposure. EPA's Final Certification and Training and Worker Protection Standard rules will also protect pesticide applicators and farmworkers.

Learn more about paraquat and the new measures to reduce risk: <https://www.epa.gov/ingredients-used-pesticide-products/paraquat-dichloride>

Learn about EPA's Certification and Training Rule: <https://www.epa.gov/pesticide-worker-safety/revised-certification-standards-pesticide-applicators>

Learn about EPA's Worker Protection Standard: <https://www.epa.gov/pesticide-worker-safety/revisions-worker-protection-standard>

To view the docket on [www.regulations.gov](http://www.regulations.gov): EPA-HQ-OPP-2011-0855-0112

(EPA December 15, 2016)

<https://www.epa.gov/pesticides/epa-takes-action-prevent-poisonings-herbicide>

# EPA PROHIBITS 72 INERT INGREDIENTS FROM USE IN PESTICIDES

The U.S. Environmental Protection Agency (EPA) is taking action to remove 72 ingredients from its list of ingredients approved for use in pesticide products.

Manufacturers wishing to use these ingredients in the future will have to provide EPA with studies or information to demonstrate their safety. EPA will then consider whether to allow their use.

EPA is taking this action in response to petitions by the Center for Environmental Health, Beyond Pesticides, Physicians for Social Responsibility and others. These groups asked the agency to issue a rule requiring disclosure of 371 inert ingredients found in pesticide products. Instead, EPA will evaluate potential risks of inert ingredients and reduce risks, as appropriate.

Many of the 72 inert ingredients removed with this action are on the list of 371 identified by the petitioners as hazardous. EPA is taking this action after considering public comments on its October 2014 proposal. EPA's list of approved inert ingredients will be updated after the Federal Register publication.

Most pesticide products contain a mixture of different ingredients. Ingredients that are directly responsible for controlling pests such as insects or weeds are called active ingredients. An inert ingredient is any other substance that is intentionally included in a pesticide that is not an active ingredient.

The list of 72 chemicals is available at <https://www.regulations.gov/document?D=EPA-HQ-OPP-2014-0558-0056>.

For EPA's current approach on inert ingredients and the May 22, 2014, response to the petitioners: <https://www.regulations.gov/document?D=EPA-HQ-OPP-2014-0558-0003>

For general information on inert ingredients:

<https://www.epa.gov/pesticide-registration/inert-ingredients-overview-and-guidance> . (EPA December 220, 2016)  
<https://www.epa.gov/newsreleases/epa-prohibits-72-inert-ingredients-use-pesticides>

## TDA ISSUES STATEMENT ON AMARILLO PESTICIDE INCIDENT

In response to the pesticide poisoning deaths of four children in Amarillo, Texas Agriculture Commissioner Sid Miller reminded consumers of the dangers of restricted use pesticides and the importance of hiring licensed pesticide applicators to avoid similar accidents.

“The deaths of these children are a terrible tragedy and my prayers go out to this family and their loved ones,” Commissioner Miller said. “Unfortunately, this tragic situation only serves as a reminder to all Texans to be extremely cautious around any pesticide and to rely upon a state-licensed structural pesticide professional for your pest control needs. There is a system in place to ensure your family's safety, but it begins with consumer awareness and education.”

According to reports, the pesticide applied under the Amarillo house was pelleted aluminum phosphide fumigant, a powerful agricultural pesticide that was never meant for consumer or residential use. The product is clearly labeled as limited for use only by a licensed professional applicator. The label contains skull and crossbones, a commonly recognized symbol for poison.

In Texas, all pest control is regulated by the Texas Department of Agriculture. Regulations cover both agricultural and structural pest control. Agricultural pesticide regulation pertains to crops, livestock and in some cases, lawn and ornamental

## EPA REJECTS REQUEST TO DELAY PESTICIDE SAFETY RULE

EPA's farmworker protection rule will go into effect Jan. 2 as scheduled, the agency said today.

The National Association of State Departments of Agriculture (NASDA) and American Farm Bureau Federation (AFBF) [petitioned EPA last week](#) to delay implementation by a year. EPA said it would respond officially to the petition in the new year.

The groups said EPA had failed to provide state lead agencies, or SLA's, with needed training materials and guidance, and had not properly alerted Congress to the presence of the "designated representative" provision in the rule.

That provision allows farmworkers to choose a third party to receive pesticide use records from a farm. Farm groups and their members are worried that anti-pesticide groups could gain access to the records and "make it seem as if (the farmers) are doing something illegal," said Paul Schlegel, director of environment and energy policy at AFBF.

Dudley Hoskins, public policy counsel at NASDA, said that "the materials and resources that states need to facilitate implementation and do outreach just aren't there."

The rule includes a host of [new requirements](#) to protect the nation's 2 million farmworkers, including annual training (instead of every five years) for the workers themselves; mandatory posting of no-entry signs for the most hazardous pesticides; and new no-entry "application exclusion zones" of up to 100 feet to protect workers from spray drift.

At its annual meeting in September, NASDA approved an "action item" urging EPA to delay implementation until the 43 states that have authority to implement pesticide laws have adequate resources to do so. The petition, AFBF's Schlegel

shrubs. Structural pest control is the application of pesticides in and around buildings including dwellings, buildings where food is prepared, stored or purchased, and other public buildings like schools and healthcare facilities. The science of structural pest control is highly regulated because of its close proximity to people and pets. Before an individual can be licensed, they must pass a criminal background check, receive training and pass a test. Even then they may only operate under the supervision of an experienced certified applicator. Pest control companies are also required to be licensed, insured and are subject to periodic inspections. All pest control applicators are required to take annual training to ensure they are up to date on the latest scientific research regarding pesticide application and possible issues.

Commissioner Miller also made a distinction between restricted-use pesticides and consumer household pesticides.

"We all buy pesticides at our local hardware store to use in our homes and gardens," Commissioner Miller said. "To be clear, these are NOT restricted-use pesticides like the one that caused the tragic deaths in Amarillo. However, even when using these consumer-grade pesticides, please read the instructions carefully, follow directions and look for safety information on the label."

"Obviously, we encourage everyone to use a licensed, trained and insured pest control professional for their pest control needs," said Don Ward, Executive Director of the Texas Pest Control Association. "However, if you need to do it yourself, please read the label on the product to ensure that it is safe for home use and only use it according to the label." (PCT Online, January 4, 2017) <http://www.pctonline.com/article/tda-amarillo-pesticide-response/>

said, was basically a “last-ditch effort to get any sort of relief.”

But Virginia Ruiz, director of occupational and ecological health at Farmworker Justice, said she was “bewildered” by the petition, given the long history behind the rule, which was [published in November 2015](#).

“They’re not drastic changes,” she said, calling the rule “a step in the right direction to making the agricultural workplace safer.”

She said it’s important for workers, who often do not speak English and are afraid that asking for information might threaten their employment, to be able to designate someone else to receive pesticide use information.

“Workers have the right to access that information already,” she said. “We’ve seen a couple of cases where workers were impeded in accessing important exposure information that would have helped them get medical treatment.”

Schlegel, however, said AFBF supports the right of health care providers to have access to information. “That’s dealt with in a separate part of the regulation,” he said. “We’ve never contested that.”

Instead, he said, AFBF objects to third parties gaining access to records that “they can do whatever they want with” and do not have to share with the workers.

He said AFBF also is unsure about farmers’ legal obligations to provide information when workers use falsified documents to gain employment. “Is the farmer legally obliged to surrender those records?” he asked, saying AFBF has not gotten an adequate response to that question from EPA.

Ruiz also questioned the farm groups’ request for a delay by pointing out that EPA had awarded NASDA’s research foundation a pesticide safety grant but that the foundation “refused to accept it.”

NASDA CEO Barbara Glenn said the research foundation (NASDARF) made a “business decision” in May [to reject two cooperative](#)

[agreements](#) regarding pesticide safety - one to coordinate meetings and workshops and the second to distribute funding to train applicators.

The foundation’s board decided that accepting the awards “wasn’t in NASDARF’s best interests,” she said.

Schlegel said he “suspects” the new administration will have the flexibility to extend the rule’s deadlines but that he is not optimistic about the chances of that happening.

(Agri-Pulse December 29, 2016) <http://www.agri-pulse.com/EPA-rejects-request-to-delay-pesticide-safety-rule-12292016.asp>

## **ADVISORY PANEL DIVIDED OVER US EPA GLYPHOSATE ASSESSMENT**

A US EPA advisory committee last week offered a mixed review of the Agency’s conclusion that the herbicide, glyphosate, is not a human carcinogen and did little to quell controversy surrounding the active ingredient. Several members of the FIFRA Scientific Advisory Panel (SAP) voiced support for the EPA’s findings but others suggested that there was ample room to question the Agency’s review of glyphosate’s carcinogenicity. “Rarely does a panel disagree as much as this one,” said SAP member Kenneth Portier, vice-president of the American Cancer Society’s Statistics and Evaluation Center.

The 15 -member panel of scientists was asked by the EPA to review its assessment of glyphosate’s carcinogenicity with specific instructions to review the Agency’s consideration of more than 250 studies and examine the data used for each line of evidence and weight-of-evidence analysis.

At the start of the four-day meeting, EPA Office of Pesticide Programs (OPP) director Jack Housenger urged the panel to provide clear advice and help the Agency “put this chemical to bed.”

But that appears unlikely and the meeting highlighted how the EPA's work is being affected by controversy from last year's decision by the UN WHO's International Agency for Research on Cancer (IARC) to declare glyphosate a probable human carcinogen. The IARC said that its conclusions were based on "convincing evidence" that glyphosate could cause cancer in laboratory animals and limited evidence of carcinogenicity in humans for non-Hodgkin lymphoma from agricultural exposure studies from the US, Canada and Sweden.

The declaration ran counter to other assessments, however, and the EPA's own review also did not agree with the IARC. Dr Monique Perron, a toxicologist with the OPP, told attendees that the EPA's review had some "fundamental differences" compared to the IARC. The latter reviewed "only published literature" she said. "We have a very extensive database of our own that we can't ignore." The EPA's database includes an array of unpublished studies submitted by pesticide registrants. Dr Perron said that the additional data used by the Agency for its assessment "has either been reviewed internally or through a peer review process."

Several members of panel said that the EPA's conclusions looked sound and well-supported by the record. "I'm a little surprised there's this controversy," said Marion Ehrich, co-director of the Laboratory for Neurotoxicity Studies at the Virginia-Maryland Regional College of Veterinary Medicine. "I thought EPA did a pretty good job."

But other panelists raised concern about the potential of glyphosate to promote potentially cancerous stomach lesions as well as worry that epidemiological studies collectively suggested evidence between exposure to the herbicide and non-Hodgkin lymphoma.

Suggestive evidence of the non-Hodgkin link warrants a rethink by the Agency, according to Lianne Sheppard, assistant chair of the Department of Environmental and Occupational Health Sciences at the University of Washington. "It's clear to me that we can't conclude -- as the Agency has done --

that it's not carcinogenic," she said. "That is completely inappropriate based on their criteria."

US FDA research microbiologist Barbara Parsons said that she was "hung up" on the data that links glyphosate exposure to cancer in rats. "There is sufficient evidence to say that glyphosate is a high-dose rodent carcinogen," said Dr Parsons, who noted that she does not support the EPA's conclusion as "an appropriate descriptor."

Environmentalists at the SAP meeting were similarly unconvinced and pressed the panel to disagree with the EPA, suggesting that the Agency was over-reliant on industry studies and ignoring animal studies that raised concern about glyphosate's carcinogenicity.

But their complaints were countered by presentations from industry interests, led by scientists from Monsanto, who highlighted studies touting the safety and benefits of glyphosate.

Industry representatives said that the IARC is an outlier, noting that virtually every other review of glyphosate, including recent assessments by the European Food Safety Authority, the Joint FAO/WHO Meeting on Pesticide Residues and the Canadian Pest Management Regulatory Authority, has found little worry about cancer risks from the herbicide.

The panel has 90 days to compile and submit its recommendations to the EPA. The Agency intends to complete its registration review of glyphosate in 2017. The review started in 2009 and is some two years behind schedule. (Pesticide & Chemical Policy/AGROW, December 21, 2016)

## ANTS COMMUNICATE VIA MOUTH-TO-MOUTH FLUID EXCHANGE

Liquids shared mouth-to-mouth by social insects contain proteins and small molecules that can influence the development and organization of their colonies, according to new findings published in eLife.

The study from the University of Lausanne, Switzerland, suggests Florida carpenter ants can collectively influence their communities by shifting the cocktail of proteins, hormones and other small molecules that they pass mouth-to-mouth to one another and their young through a process called trophallaxis.

"Food is passed to every adult and developing ant by trophallaxis. This creates a network of interactions linking every member of the colony," says senior author Laurent Keller, Professor in the Department of Ecology and Evolution.

"A lot of researchers consider trophallaxis only as a means of food-sharing," adds Professor Richard Benton of the Center for Integrative Genomics, also a senior author of the study. "But trophallaxis occurs in other contexts, such as when an ant is reunited with a nest-mate after isolation. We therefore wanted to see if the fluid exchanged by trophallaxis contains molecules that allow ants to pass other chemical messages to each other, and not just food."

To answer this question, the team, led by first author and postdoctoral researcher Dr Adria LeBoeuf, analysed fluid from pairs of ants engaged in trophallaxis. Surprisingly, they identified a large number of proteins that appear to be involved in regulating the growth of ants, along with high levels of juvenile hormone, an important regulator of insect development, reproduction, and behaviour.

To see what effect this hormone has on the growth of larvae fed by trophallaxis, the scientists added it to the food of larvae-rearing ants and discovered that the hormone made it twice as likely that the larvae would survive to reach adulthood.

"This indicates that juvenile hormone and other molecules transferred mouth-to-mouth over this social network could be used by the ants to collectively decide how their colony develops," says LeBoeuf. "So, when the ants feed their larvae, they aren't just feeding them food, they are casting quantitative ballots for their colony, administering different amounts of growth-promoting components to influence the next generation.

"The effects of juvenile hormone that we see are consistent with previous studies in other ants and in bees where larvae treated with an analogue of this hormone tend to develop into larger workers and even queens."

Along with growth proteins and juvenile hormone, the team also identified small molecules and chemical signals in the carpenter ants' trophallactic liquid that help them recognize their nest-mates. They demonstrated for the first time the presence of chemical cues in the fluid that are known to be important in providing ants with a colony-specific odour that allows them to distinguish family from non-family members.

"Overall, we show that liquid transmitted among ants contains much more than food and digestive enzymes," adds LeBoeuf. "Our findings suggest that trophallaxis underlies a private communication channel that ants use to direct the development of their young, similar to milk in mammals."

"More generally, this opens the possibility that the oral exchange of fluids, such as saliva, in other animals might also serve previously unsuspected roles."

Source: The paper 'Oral transfer of chemical cues, growth proteins and hormones in social insects' can be freely accessed online at <http://dx.doi.org/10.7554/eLife.20375>

(PCT Online, December 2, 2016)  
<http://www.pctonline.com/article/ants-communicate-via-fluid-exchange/>



# COMMUNITY-WIDE IPM CAN CONQUER COCKROACHES IN APARTMENTS

Many pest problems occur in homes. Among them, cockroaches and rodents are two of the most frequently reported pest problems. The German cockroach, *Blattella germanica* (L.), is a carrier of varied pathogens (Elgderi et al. 2006). Rodents cause property damage and food contamination. Both cockroaches and rodents produce allergens that are an important trigger for indoor allergy and asthma (Rosenstreich et al. 1997, Huss et al. 2001, Berg et al. 2008, Matsui 2009). In addition, bed bugs emerged as a new problem in many communities the past 10 to 15 years.

Historically, conventional insecticide spray treatments caused development of insecticide resistance among cockroach populations. Resistance to pyrethroids and other pesticides such as DDT, diazinon, and malathion have been reported in previous studies (Collins 1973, Umeda and Hirano 1988, Scott et al. 1990). Compared to conventional chemical treatments, gel baits and Integrated Pest Management (IPM) are preferred for cockroach management in apartments nowadays. In a study by Sever et al. (2007), the median cockroach count from sticky traps in apartments treated by researchers using gel bait decreased from 426.5 to 0 in six months. In contrast, the median cockroach count decreased from 308.5 to 56 in apartments treated by commercial contractors using hydramethylnon gel baits, insect growth regulators and pyrethroids; and increased from 205.5 to 285 in the non-treated control group. In a study conducted by Wang and Bennett (2006), IPM and bait-only treatments reduced cockroach trap counts during a short period (16 weeks) by 100% and 94.6%, respectively.

In spite of the highly effective cockroach management tools and methods that are available, German cockroach infestations remain prevalent in apartment buildings. Why are they so prevalent? How do we achieve a high level of elimination? In this study we investigated the prevalence of pests and evaluated a community-wide cockroach IPM program in a low-income community over a seven-month period.

**MATERIALS AND METHODS.** The study site was an apartment complex managed by New Brunswick Housing and Redevelopment Authority (New Brunswick, N.J.). The occupants consisted of low-income families or seniors. The complex contained 258 units within 40 buildings. As with many other low-income communities in New Jersey, this community had disproportionately higher pest infestations. The existing pest control provider hired by the housing authority came once a month to control pests based on a list of resident complaints provided by the management office. They would apply gel baits in kitchen cabinets for cockroach control and place glueboards for rodent control. If residents were not at home at the time of the visit, the pest control technician would not enter the apartments. Based on our conversation, only about two tubes (60 grams) of cockroach bait was used per month. About two technicians spent half to one day a month to service the whole complex. We conducted community-wide household pest surveys in October 2015 and May 2016. A total number of 225 and 205 apartments were accessed during the two surveys, respectively. Some apartments were not accessed because they were vacant, had private locks installed by tenants, or the tenant refused our access. During the initial survey, tenants who had ongoing indoor pest issues were asked the following questions: 1) Do you see any of the following pests in your apartment (rodents, cockroaches, bed bugs)? 2) Have you used pesticides to control pests in the past half year? 3) Are you satisfied with the pest control service provided by housing? To evaluate the program's effectiveness, we asked the same questions to the same group of residents at the end of the study if the residents were at home. We also visually assessed the sanitation level (clean, normal, dirty) and clutter level (low, medium, high) in the kitchen of each these apartments in October 2015 and May 2016.

We inspected signs of bed bug infestation in bedrooms and living rooms. Apartments with bed bug infestations were recorded. If signs were present but no live bugs were found, ClimbUp insect interceptors (Susan McKnight, Inc., Memphis, Tenn.) were installed under bed and sofa legs, and inspected approximately two weeks later.

Trapper monitor & insect traps (1/3 of the whole piece) (Bell Laboratories, Madison, Wis.) were

placed in every apartment with confirmed or suspected cockroach infestation. Six traps (labeled as 1-6) were placed in certain locations in the kitchens and bathrooms and checked 1-4 days later, depending on our schedule and availability of housing staff for assistance in accessing the apartments. The locations of the six monitoring traps were: 1) kitchen cabinet under the sink, 2) kitchen cabinet above the sink, 3) under the stove, 4) behind the refrigerator, 5) on the kitchen floor next to the heater or trash can, and 6) behind toilet in the bathroom. All cockroach trap counts were adjusted to one-day counts during analysis.

**IPM IMPLEMENTATION.** We provided one-page brochures on cockroach prevention and control, pesticides and human health and home pest control. During home visits, we orally instructed residents to clean the floors, reduce clutter, put away pet food during the night, and stop using pesticides by themselves.

All infestations with 10 or more cockroaches in monitoring traps during the first survey were treated with Advion cockroach gel bait (Syngenta Crop Protection, Greensboro, N.C.) and Borid boric acid dust (FMC Corporation, Philadelphia). Cockroach bait was applied mostly in kitchens and bathrooms where most cockroach activities were present. Boric acid dust was applied using a duster behind the refrigerator, stove and toilet. The average amount of bait and boric acid dust applied per apartment during the initial treatment was 20 grams and 6 grams, respectively. The amount of insecticide used was based on the severity of the infestations. We swept the area around the refrigerator using a broom before applying boric acid dust if it was dirty.

For light infestations (with 10 or fewer cockroaches in monitoring traps), we used mass trapping instead of bait and insecticide dust. Six traps were placed in the same locations as the monitoring traps, and four more traps were added to the kitchen counter, closet in the living room beside the kitchen, and refrigerator.

We monitored the results by visiting each cockroach-infested apartment approximately every two weeks. On the first day, traps were placed following the same protocol as before. On the second day (or fourth day based on previous visit date), traps were examined and discarded.

Additional treatments (baiting, dusting, placing new traps) were made depending on trap counts. If trap count was zero, then the traps were left continuously in the apartments for detecting very low level infestations. Cockroach elimination was considered achieved when there were no cockroaches in traps during a one-month trapping period. The follow-up monitoring and re-treatment lasted 25 weeks. All treatments were carried out by licensed Rutgers University researchers.

The existing pest control provider hired by the housing authority provided bed bug and rodent control. The contractor visited the infested apartments on a monthly basis based on the list provided by the housing staff. They used Transport Mikron (active ingredient: acetamiprid, bifenthrin) to treat bed bugs and rodent bait or glueboards for rodents. We advised the housing authority to request that the contract adopt more effective IPM strategies for managing bed bugs and rodents. A short list of cost-effective, non-chemical and chemical bed bug control methods was provided to the contractor. But these recommendations were not adopted based on our observations.

**RESULTS.** Based on interviews and examination of monitoring traps at 0 month, German cockroaches are the No. 1 pest. A total of 62 apartments (28%) had German cockroaches. Rodents and bed bugs were the second and third most common household pests. Residents from 24 apartments (11%) reported rodent issues. A total number of 17 apartments (8%) were infested with bed bugs. Considering the fact that many tenants were not home during our visit, the actual rodent infestation rate should be higher. During our cockroach treatments, rodent infestations were either found by the sticky traps or through complaints by the residents in 14 out of 64 (22%) treated apartments. Among those 14 apartments, 11 were not found during our first survey. Ants were extremely common indoor insects based on examination of cockroach traps, but only seven residents (3%) mentioned ant issues in our survey. It was apparent that residents were not concerned about ants as much as other pests. Only one resident complained about termite issues in his house.

A total of 64 apartments were treated for cockroaches. This includes the initial 62 identified

apartments and two more apartments that were subsequently added during the treatment process upon request by tenants at week 9 and 19. After our treatment, the average cockroach count (one-day trapping period) per apartment decreased rapidly (*see Fig. 1*). The mean count was reduced by 64, 84, 96, 97, and 100% at week 2, 4, 7, 9, and 29, respectively. During the 7-month period, an average amount of 35 grams of bait (1.2 tubes) and 35 grams of dust were used in each treated apartment. The average time spent per apartment per visit (including the time between apartments) ranged from 11 to 14 minutes (two researchers worked together most of the time) and was relatively constant throughout the study period.

During our 7-month survey, 16 apartments were identified with cockroach infestations. Among them, 10 were newly found infestations and six were treated by us but were never eliminated. Out of the 10 new infestations found during the 7-month survey, five of them were not accessible during the 0 month survey. Therefore, the initial survey failed to identify 7% (5 out of 69) of the infested apartments. Among the 64 units that were treated, cockroaches were eliminated in 46 apartments, 8 apartments still had cockroaches, and 12 apartments were not inspected during the final survey due to lack of access. The confirmed elimination rate was 85% (44 out of 52).

After 7 months, 9 apartments had bed bug infestations (47% reduction), and 20 apartments had rodent infestations (17% reduction). These numbers suggest that the bed bug and rodent control methods were ineffective.

We were able to interview the same 21 residents both at 0 and 7 months. At 0 month, 91% of the residents treated cockroaches using over-the-counter pesticides including sprays, insect bombs, baits, and dusts; only 29% of the residents were satisfied with the existing pest control service provided by the management office. At 7 months, 14% of the residents still saw traces of cockroach activity, only 19% of them used pesticides by themselves after we initiated the IPM program, and 91% of the residents were satisfied with our cockroach control service (*see Fig. 2*).

We compared the sanitation and clutter levels at 0 and 7 months in the 21 apartments. Five apartments showed some improvement in sanitation or clutter levels, 5 apartments became worse, 9 apartments were similar as before, and 2 apartments were not evaluated. Overall, the education did not significantly improve the sanitation and clutter level in the residents' apartments.

**DISCUSSION.** The community-wide cockroach IPM program reduced cockroach counts by 96% at the fourth visit (7 weeks after initial treatment), which is similar to previous studies in low-income communities (Wang and Bennett 2006, Wang et al. 2013). By providing effective pest control the percentage of residents who used pesticides reduced by 79% (from 91% to 19%), resident satisfaction increased by two times.

However, complete cockroach elimination for the whole community is hard to achieve. After 7 months, cockroaches were never eliminated in a few apartments, and new infestations were found. Lack of cooperation was the major obstacle in eliminating cockroach infestations on a community-wide scale. Below are some factors that contributed to the failure in cockroach elimination:

**NO ACCESS TO APARTMENTS.** During our treatment, 12 out of 64 apartments were not accessible for at least one visit. Failing to access apartments caused a delay in our treatments.

Lack of housekeeping cooperation. Despite our education on the importance of cleaning, some apartments were still dirty and cluttered at the end of the treatment. In a few apartments, structural damage, such as broken cabinets or leaking pipes, provided an ideal environment for cockroaches. They were sometimes not repaired in a timely manner.

**MISSING MONITORING TRAPS.** Disturbed or lost monitoring traps were a common problem. Disturbed traps were usually found relocated, flipped, flattened, or wet. According to tenants' reports, some traps were thrown away because children and pets played and chewed on them, or live mice were caught in them. When using sticky traps as monitoring tools in apartments such factors

should be considered when deciding where to place them.

**CONCLUDING REMARKS.** While pest management faces many challenges in low-income communities, most roach infestations (85%) were able to be eliminated by adopting a community-wide IPM program in a 7-month period in our study. The majority of the cockroach populations (97%) were eliminated after just four visits. Follow-up monitoring is critical in confirming elimination success. A community-wide pest survey is valuable for identifying new and missed infestations.

The low elimination rates in rodent and bed bug infestations suggest the pest control provider should adopt similar IPM strategies as our cockroach control program. Implementation of a more effective IPM program changed residents' behavior and attitude towards pest control. On the other hand, the effect of education on sanitation and clutter was not as effective, suggesting other measures must be taken to change residents' behavior towards sanitation and clutter.

(PCT Online, December 21, 2016)

<http://www.pctonline.com/article/community-wide-ipm-roaches-apartments/>

## **ENVIROS PRESS US EPA ON PESTICIDE MIXTURES**

Environmentalists are pressuring the US EPA to tackle the issue of pesticide mixtures, suggesting that the Agency is abdicating its responsibility to address the potential synergistic effects of pesticide products.

A coalition of 15 organisations, led by the Center for Biological Diversity (CBD), sent a letter last month urging the Agency to require agrochemical companies to provide data on pesticide synergy as part of the registration process. "The bottom line is whether the application of multiple ingredients can have a synergistic effect for certain combinations of pesticides," the coalition says. "Without expressly requiring applicants to provide information on synergy, it is highly likely that the EPA is

underestimating the negative impacts on the environment of pesticide exposure in its analyses."

Absent new requirements, the EPA "cannot comply" with its duty under federal pesticide law to ensure that approval of pesticides will not cause harm to the environment and public health, the groups contend.

The December 21st letter is a follow-up by the coalition to a petition submitted to the EPA by the CBD in June 2016. The petition calls on the EPA to craft regulations to address synergies in pesticide products, but the Agency has yet to fully respond to the environmentalists' demands.

The coalition sent the petition in the wake of controversy around the synergistic effects of Dow AgroSciences' herbicide, Enlist Duo (2,4-D choline + glyphosate). A federal court remanded the Enlist Duo registration back to the EPA at the Agency's request to address the product's synergistic effects. In November, the EPA concluded that it had no concerns about the issue, but the environmentalists are unconvinced and want the Agency to also consider tank mixing of pesticide products.

"Many pesticide products on the market are likely more harmful than the EPA has previously assumed because some of the most common combinations of ingredients cause synergistic effects, and most pesticide product labels do not meaningfully limit tank mixtures or co- application," the groups say. "Therefore, it is imperative that the EPA consider synergistic effects of pesticide products during its registration and registration review process, and include protective label restrictions to eliminate or mitigate adverse, synergistic environmental impacts." (Pesticide & Chemical Policy/AGROW, January 3, 2017)

## CEU Meetings

Date: January 10-11, 2017

Title: 2017 Oklahoma-Arkansas Turfgrass Short Course

Location: OSU Botanical Garden Education Center Stillwater OK

Contact: Dr. Dennis Martin 405-744-9709

Course #: OK-16-219

www.turf.okstate.edu

CEU's:                   Category(s):

6                           3A

6                           10

Date: January 16-18, 2017

Title: 2017 OAAA Annual Program

Location: Embassy Suites Norman OK

Contact: Sandy Wells 405-341-3548

Course #: OK-16-2218

CEU's:                   Category(s):

11                         A

8                         1A

3                         2

3                         3A

2                         3C

2                         5

3                         6

8                         10

1                         12

Date: March 28, 2017

Title: Ensystex 2017 OK CEU Workshop

Location: Holiday Inn Express 102 St Tulsa

Contact: Donald Stetler Jr. (281) 217-2965

Course #: OK-16-205

www.ensystex.com

CEU's:                   Category(s):

2                           3A

3                           7A

1                           7B

Date: March 29, 2017

Title: Ensystex 2017 OK CEU Workshop

Location: Holiday Inn Express Midwest City Ok

Contact: Donald Stetler Jr. (281) 217-2965

Course #: OK-16-205

www.ensystex.com

CEU's:                   Category(s):

2                           3A

3                           7A

1                           7B

Date: February 14, 2017

Title: Ensystex 2017 OK CEU Workshop

Location: La Quinta Paris TX

Contact: Donald Stetler Jr. (281) 217-2965

Course #: OK-16-205

www.ensystex.com

CEU's:                   Category(s):

2                           3A

3                           7A

1                           7B

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

Wood Destroying Organism Inspection Course

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

CTN Educational Services Inc

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

Pest Network

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

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.oda.state.ok.us/cps-ceuhome1.htm>

## ODAFF Test Information

Pesticide applicator test sessions dates and locations for January/February are as follows:

January		February	
10	McAlester	2	Enid
10	OKC	7	McAlester
11	Lawton	7	OKC
12	Tulsa	9	Tulsa
17	Ardmore	14	Altus
23	OKC	21	Ardmore
26	Tulsa	23	Tulsa
		27	OKC

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 33<sup>rd</sup> St. Edmond  
OK (New Location)

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

**RENEWAL FORM TO REMAIN ON OR BE ADDED TO  
*PESTICIDE REPORT's* MAILING LIST**

**PLEASE PRINT - THANK YOU!**

**Name** \_\_\_\_\_

**Company/Business Name** \_\_\_\_\_

**Address** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip Code** \_\_\_\_\_

**E-Mail** \_\_\_\_\_

**Please send to:** Charles Luper or Kevin Shelton  
Pesticide Safety Education Program  
127 NRC  
Oklahoma State University  
Stillwater, OK 74078-3033

or E-mail us at: [Sharon.hillock@okstate.edu](mailto:Sharon.hillock@okstate.edu). Please type Pesticide Report in the subject box.

If this is not returned your name will be removed from the *Pesticide Report's* mailing list.

**Oklahoma State University EXTENSION personnel ARE NOT TO RETURN this form.**