



Chemically Speaking

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USDA Releases 2017 Annual Pesticide Data Program Summary

The U.S. Department of Agriculture (USDA) today published the 2017 Pesticide Data Program (PDP) Annual Summary. The Summary shows more than 99 percent of the samples tested had pesticide residues well below benchmark levels established by the Environmental Protection Agency (EPA).

Each year, USDA and EPA work together to identify foods to be tested on a rotating basis. In 2017, tests were conducted on fresh and processed foods including fruits and vegetables as well as honey, milk and bottled water. USDA's Agricultural Marketing Service (AMS) partners with cooperating state agencies to collect and analyze pesticide residue levels on selected foods. For over 25 years, USDA has tested a variety of commodities including fresh and processed fruits and vegetables, dairy, meat, poultry, grains, fish, rice, specialty products and water.

USDA tests a wide variety of domestic and imported foods, with a strong focus on foods that are consumed by infants and children. EPA relies on PDP data to conduct dietary risk assessments and to ensure that any pesticide residues in foods remain at levels that EPA has determined to be safe. USDA uses the data to help U.S. farmers improve agricultural practice and to enhance the department's [Integrated Pest Management Program](#).

The annual pesticide residue results are reported to the Food and Drug Administration (FDA) and EPA in monthly reports as testing takes place throughout the year. FDA and EPA are immediately notified if a PDP test discovers residue levels that could pose a public safety risk.

The 2017 data and summary can be found on the [Pesticide Data Program page](#) on the AMS website. Printed copies may be obtained by contacting the USDA AMS, Science and Technology Program, Monitoring Programs Division by e-mail at amsmpo.data@ams.usda.gov.

For more information about pesticides and food, please visit the [EPA website](#) and the [FDA website](#). (NPSEC News, 12/21/18)

Special Collection: Pesticide Exposure in Non-Honey Bees

Bees are essential pollinators of a variety of plants, including many used for human food. In recent years, there have been declines in bee populations due to a variety of factors. One of those factors is pesticides.

While honey bees (genus *Apis*) tend to get a lot of attention in the media and research, non-honey bees are also important pollinators and could face similar threats from pesticides as honey bees do. However, not as much is known about how pesticides affect non-*Apis* bees, such as bumble bees, solitary bees, and stingless bees.

In order to help fill the knowledge gap, a workshop was held that brought together experts in non-*Apis* bees from academia, regulatory bodies, and industry. These experts sought to answer questions such as:

- What is currently known about non-*Apis* species and how their life history traits differ from honey bees in relation to exposure to pesticides?
- What are dominant exposure routes and secondary exposure routes to pesticides for solitary bees and social non-*Apis* bees?
- Is the honey bee a good surrogate for evaluating exposure for other bees?
- What research needs to be conducted?

The logistical details, discussions, and synthesized outcomes of the workshop have been compiled into a special collection of papers published in *Environmental Entomology*, including a preface paper that expounds on the reasons for the workshop and the collection.

The papers are freely available to read and download.

[Preface: Workshop on Pesticide Exposure Assessment Paradigm for Non-*Apis* Bees](#)

Richard Bireley, Shannon Borges, Karina Cham, David Epstein, Kristina Garber, Connie Hart, Wayne Hou, Alessio Ippolito, Jens Pistorius, Veronique Poulsen, Keith Sappington, and Thomas Steeger

[Workshop on Pesticide Exposure Assessment Paradigm for Non-*Apis* Bees: Foundation and Summaries](#)

Natalie K. Boyle, Theresa L. Pitts-Singer, John Abbott, Anne Alix, Diana L. Cox-Foster, Silvia Hinarejos, David M. Lehmann, Lora Morandin, Bridget O'Neill, Nigel E. Raine, Rajwinder Singh, Helen M. Thompson, Neal M. Williams, and Thomas Steeger

[Pesticide Exposure Assessment Paradigm for Solitary Bees](#)

Fabio Sgolastra, Silvia Hinarejos, Theresa L. Pitts-Singer, Natalie K. Boyle, Timothy Joseph, Johannes Lückmann, Nigel E. Raine, Rajwinder Singh, Neal M. Williams, and Jordi Bosch

[Pesticide Exposure Assessment Paradigm for Stingless Bees](#)

Karina O. Cham, Roberta C. F. Nocelli, Leandro O. Borges, Flávia Elizabeth C. Viana-Silva, Carlos Augusto M. Tonelli, Osmar Malaspina, Cristiano Menezes, Annelise S. Rosa-Fontana, Betina Blochtein, Breno M. Freitas, Carmen Silvia S. Pires, Favízia F. Oliveira, Felipe Andres L. Contrera, Karoline R. S. Torezani, Márcia de Fátima Ribeiro, Maria A. L. Siqueira, and Maria Cecília L. S. A. Rocha

[Comparison of Pesticide Exposure in Honey Bees \(*Hymenoptera: Apidae*\) and Bumble Bees \(*Hymenoptera: Apidae*\): Implications for Risk Assessments](#)

Angela E. Gradish, Jozef van der Steen, Cynthia D. Scott-Dupree, Ana R. Cabrera, G. Christopher Cutler, Dave Goulson, Olaf Klein, David M. Lehmann, Johannes Lückmann, Bridget O'Neill, Nigel E. Raine, Bibek Sharma, and Helen Thompson

[Non-*Apis* Bee Exposure Workshop: Industry Participants' View](#)

Silvia Hinarejos, John Abbott, Anne Alix, Sharma Bibek, Ana Cabrera, Timothy Joseph, Bridget O'Neill, Rajwinder Singh, and Helen Thompson (NPSEC News, 12/21/18)

EPA Re-Registers Dicamba Through 2020

On October 31, EPA extended the registration of Xtendimax with Vaporgrip, Engenia, and Fexapan

through December 20, 2020. Details are at: <https://www.epa.gov/ingredientsused-pesticide-products/registrationdicamba-use-dicamba-tolerant-crops>.

New Dicamba Product labels: [Xtendimax with Vaporgrip](#) (Updated November 1, 2018), [Engenia & Fexapan](#).

Dicamba federal register documents: EPA has also posted several documents on the regulations.gov website pertaining to dicamba: <https://www.regulations.gov/docket?D=EPA-HQ-OPP-2016-0187>. Under “Supporting Documents” there are two documents: 1) Dicamba Pesticide Use Limitation Areas – County list; and 2) The Scientific Basis for Understanding the Off-Target Movement Potential of Xtendimax, which is a 46 page document from Monsanto that explains why (a) vapor drift occurring due to volatilization should not result in impacts off the treated field; and (b) spray drift will not occur past the label’s required buffer distances in amounts that would have an adverse effect on plant height. Also, under the “Comments Section,” there is a post from October 31, 2018 titled “Dicamba 2018 Comments,” which is 553 pages of documents that EPA received from stakeholders asking them to re-reregister, not re-register, etc.

Dicamba lawsuit: The National Family Farm Coalition, Center for Food Safety, Center for Biological Diversity (CBD) and Pesticide Action Network (PAN) North America filed a lawsuit against EPA in 2017 claiming that the 2016 registration of the three new dicamba herbicides violated the Endangered Species Act and FIFRA. See [“Ninth Circuit Dicamba Battle”](#) for more details. If the Ninth Circuit Court of Appeals rules in favor of the plaintiffs, EPA would have to suspend the registration of the three new dicamba products. A decision may not occur until this coming spring but could happen in the coming weeks. (WSSA Newsletter, 1/19)

National Survey of Common and Troublesome Weeds

The 2018 survey results for weeds in aquatic and non-crop areas is posted at <http://wssa.net/wssa/weed/surveys/>. The most troublesome weed in the three aquatic areas was hydrilla and most troublesome in the four non-crop areas was cogongrass. Not surprisingly, both those weeds are on the federal noxious weed list. What was surprising is that hydrilla was also the most common aquatic weed in the U.S. What can the Animal and Plant Health Inspection Service (APHIS) do to help get these weeds under control? Likewise, cogongrass is listed as the 6th most common non-crop weed. The most common non-crop weeds are the *Bromus spp.*, in particular downy brome (cheatgrass). The 2019 weed survey will focus on weeds in broadleaf crops, fruits and vegetables. (WSSA Newsletter, 1/19)

Frogeye Leaf Spot on Soybean - South Dakota, USA: Strobilurin Resistance

South Dakota State University [SDSU] and University of Kentucky plant pathologists have confirmed that *Cercospora sojina* that causes soybean frogeye leaf spot has shown resistance to QoI fungicides (quinone outside inhibitor, strobilurin) in South Dakota. SDSU's Febina Mathew says, "This finding warrants the need to determine the prevalence of QoI fungicide-resistant *C. sojina* in the state."

Frogeye leaf spot is predominantly managed through fungicides.

According to Mathew, in 2014 frogeye leaf spot was ranked 4th most destructive disease affecting soybean in the southern US. *C. soja* resistance to QoI fungicide was first documented in Tennessee in 2010 and has been detected in several other states since, including Iowa in 2017.

SDSU's Emmanuel Byamukama says. "Because this fungus has high genetic diversity and can be spread via seed, resistant isolates can develop even without extensive use of QoI fungicides." Fungicide resistance can be delayed by using practices such as planting resistant varieties, crop rotation, drainage and proper soil fertility levels. (Farm Forum, 2/25/19)

How the Humble Marigold Outsmarts a Devastating Tomato Pest

Scientists have revealed for the first time the natural weapon used by marigolds to protect tomato plants against destructive whiteflies.

Researchers from Newcastle University's [School of Natural and Environmental Sciences](#), carried out a study to prove what gardeners around the world have known for generations - marigolds repel tomato whiteflies.

Publishing their findings today (1 March 2019) in the journal *PLOS ONE*, the experts have identified limonene - released by marigolds - as the main component responsible for keeping tomato whiteflies at bay. The insects find the smell of limonene repellent and are slowed down by the powerful chemical.

Large-scale application

The findings of the study have the potential to pave the way to developing safer and cheaper alternatives to pesticides.

Since limonene repels the whitefly without killing them, using the chemical shouldn't lead to resistance, and the study has shown that it doesn't affect the quality of the produce. All it takes to deter the whiteflies is interspersing marigolds in tomato plots or hang little pots of limonene in among the tomato plants so that the smell can disperse out into the tomato foliage.

In fact, the research team, led by Dr [Colin Tosh](#) and [Niall Conboy](#), has shown that may be possible to develop a product, similar to an air freshener, containing pure limonene, than can be hung in glasshouses to confuse the whiteflies by exposing them to a blast of limonene.

Newcastle University PhD student Niall said: "We spoke to many gardeners who knew marigolds were effective in protecting tomatoes against whiteflies, but it has never been tested scientifically.

"We found that the chemical which was released in the highest abundance from marigolds was limonene. This is exciting because limonene is inexpensive, it's not harmful and it's a lot less risky to use than pesticides, particularly when you don't apply it to the crop and it is only a weak scent in the air.

"Most pesticides are sprayed onto the crops. This doesn't only kill the pest that is targeted, it kills absolutely everything, including the natural enemies of the pest."

Limonene makes up around 90% of the oil in citrus peel and is commonly found in household air fresheners and mosquito repellent.

Dr Tosh said: “There is great potential to use limonene indoors and outdoors, either by planting marigolds near tomatoes, or by using pods of pure limonene. Another important benefit of using limonene is that it’s not only safe to bees, but the marigolds provide nectar for the bees which are vital for pollination.

“Any alternative methods of whitefly control that can reduce pesticide use and introduce greater plant and animal diversity into agricultural and horticultural systems should be welcomed.”

The researchers carried out two big glasshouse trials. Working with French marigolds in the first experiment, they established that the repellent effect works and that marigolds are an effective companion plant to keep whiteflies away from the tomato plants.

For the second experiment, the team used a machine that allowed them to analyze the gaseous and volatile chemicals released by the plants. Through this they were able to pinpoint which chemical was released from the marigolds. They also determined that interspersing marigolds with other companion plants, that whiteflies don’t like, doesn’t increase or decrease the repellent effect. It means that non-host plants of the whiteflies can repel them, not just marigolds.

A notorious pest

Whitefly adults are tiny, moth-like insects that feed on plant sap. They cause severe produce losses to an array of crops through transmission of a number of plant viruses and encouraging mold growth on the plant.

Dr Tosh said: “Direct feeding from both adults and larvae results in honeydew secretion at a very high rate. Honeydew secretion that covers the leaves reduces the photosynthetic capacity of the plant and renders fruit unmarketable.”

Further studies will focus on developing a three-companion plant mixture that will repel three major insect pests of tomato - whiteflies, spider mites and thrips.

Longer term, the researchers aim to publish a guide focussing on companion plants as an alternative to pesticides, which would be suitable across range of horticultural problems. (PLOS ONE, 3/1/19)

Bayer CEO Says Ag Giant Will Defend Itself ‘Resolutely’ in Weed Killer Suits

RESEARCH TRIANGLE PARK – Germany’s Bayer AG, which bought Monsanto Co. last year, is underlining its determination to fight cases involving the U.S. company’s Roundup weed-killer in the face of more than 11,000 lawsuits so far.

In August, a San Francisco jury awarded a man \$289 million after determining Roundup caused his non-Hodgkin’s lymphoma. A judge later slashed the award to \$78 million, and Monsanto has appealed. A second case in which a man claims the weed-killer caused cancer went to trial this week.

Bayer CEO Werner Baumann said as he presented the company's annual earnings Wednesday that, as of Jan. 28, 11,200 lawsuits had been filed. He said that "we will continue to defend ourselves resolutely in all proceedings."

He stressed that the active ingredient in Roundup, glyphosate, "is a safe product."

The Bayer-Monsanto merger had a significant impact on agtech operations in the Research Triangle.

Bayer reached a \$7 billion deal to sell parts of its Crop Science unit to German chemical company BASF to alleviate regulatory concerns over its planned takeover of Monsanto. All three companies have operations in North Carolina. Bayer Crop Science and BASF have significant operations in the Triangle. Several hundred Bayer employees in the Triangle were affected,

Overall Bayer agreed to the U.S. government's demand that it sell about \$9 billion in agriculture businesses as condition for acquiring Monsanto.

Bayer's \$57 billion takeover of Monsanto has been watched by competitors and environmental groups, which are fearful that the number of players in the business of selling seeds and pesticides will shrink further, according to CNBC.

The Department of Justice (DOJ) also required the divestiture of intellectual property, including R&D projects, and Bayer's "digital agriculture" business to develop new farm technologies to maximize crop yield.

Antitrust regulators at the DOJ said it was the biggest divestiture ever required for a merger. (WRAL TechWire, 2/27/19)

U.S. Trial Tests Claim Roundup Weedkiller Caused Cancer

SAN FRANCISCO • Bayer AG on Monday faced a second U.S. jury over allegations that its popular glyphosate-based weedkiller Roundup causes cancer, six months after the company's share price was rocked by a \$289 million verdict in California state court.

The lawsuit by California resident Edwin Hardeman, which began in federal rather than state court, is also seen as a test case for a larger litigation. More than 760 of the 9,300 Roundup cases nationwide are consolidated in the federal court in San Francisco that is hearing Hardeman's case.

Bayer denies all allegations that Roundup or glyphosate cause cancer, saying decades of independent studies have shown the world's most widely used weedkiller to be safe for human use and noting that regulators around the world have approved the product.

During the first phase in the trial, the nine-person jury is asked to weigh scientific evidence to determine whether Roundup caused Hardeman's lymphoma.

Aimee Wagstaff, a lawyer for Hardeman, told a packed courtroom during her opening statement on Monday that chemicals in Roundup made the weedkiller more toxic than glyphosate alone, causing the man's cancer.

But U.S. District Judge Vince Chhabria, who presides over the federal litigation, repeatedly scolded her for “crossing the line” by referring to internal corporate communications the judge has said have no bearing on the science in the case.

“You completely disregarded the limitations,” Chhabria said.

In a January ruling, Chhabria called evidence by plaintiffs that the company allegedly attempted to influence regulators and manipulate public opinion “a distraction” from the scientific question of whether glyphosate causes cancer.

If the jury determines Roundup caused Hardeman’s cancer, the judge said such evidence could be presented in a second trial phase.

Plaintiffs criticized Chhabria’s order dividing the trial and restricting evidence as “unfair,” saying their scientific evidence allegedly showing glyphosate causes cancer is inextricably linked to the company’s alleged wrongful conduct.

Evidence of corporate misconduct was seen as playing a key role in the finding by a California state court jury in August that Roundup caused another man’s non-Hodgkin’s lymphoma and that Bayer’s Creve Coeur-based Monsanto unit failed to warn consumers about the weedkiller’s cancer risks. That jury’s \$289 million damages award was later reduced to \$78 million.

Bayer’s share price dropped 10 percent following the verdict and has remained volatile.

Brian Stekloff, a lawyer for Bayer, in his opening statement attacked the idea of a link between Roundup and cancer. He noted U.S. rates of non-Hodgkin’s lymphoma have remained steady over time, even when Roundup use began to soar in the 1990s.

Hardeman began using the Roundup brand herbicide with glyphosate in the 1980s to control poison oak and weeds on his property and sprayed “large volumes” of the chemical for many years on a regular basis, according to court documents. He was diagnosed with non-Hodgkin’s lymphoma at the age of 66 in February 2015 and filed his lawsuit a year later. Hardeman is currently in remission.

But Stekloff on Monday said Hardeman’s age and his history of chronic hepatitis C were known risk factors for developing lymphoma. The lawyer also said the majority of non-Hodgkin’s lymphoma incidents are idiopathic or have no known cause. (St. Louis Post-Dispatch, 2/25/19)

Pesticide Registrations and Actions

- FDACS authorized the distribution and experimental use of A12460 Grass Herbicide, (fluazifop-P-butyl); unregistered, FL16-EUP-01 to evaluate efficacy of an unregistered product against torpedograss and other species in aquatic areas of Florida. This extended permit, EUP No. FL16-EUP-01, is authorized through December 31, 2019. (FDACS letter, 2/14/19)
- The United States Environmental Protection Agency (EPA), under the provisions of section

18 of FIFRA, has issued a specific exemption for the use of EPA Mycoshield® (Calcium Oxytetracycline), EPA Registration Number 55146-97 and Fire Wall™ 50 WP (Streptomycin Sulfate), EPA Registration Number 80990-3, to manage the Huanglongbing disease in citrus trees. This emergency exemption (File Symbol 19FL02 for oxytetracycline and 19FL03 for streptomycin) will expire December 31, 2019. (FDACS letter, 1/2/19)

- EPA SLN No. FL-170001 has been assigned as the Special Local Need registration number for Actigard 50WG Plant Activator (EPA Registration Number 100-922) for control of bacterial spot in peppers. (FDACS letter, 12/18/18)