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EPA Releases Draft Risk Assessments for Glyphosate

The U.S. Environmental Protection Agency (EPA) is releasing for public comment the draft human health and ecological risk assessments for glyphosate, one of the most widely used agricultural pesticides in the United States.

The draft human health risk assessment concludes that glyphosate is not likely to be carcinogenic to humans. The Agency's assessment found no other meaningful risks to human health when the product is used according to the pesticide label. The Agency's scientific findings are consistent with the conclusions of science reviews by a number of other countries as well as the 2017 National Institute of Health Agricultural Health Survey.

EPA's human health review evaluated dietary, residential/non-occupational, aggregate, and occupational exposures. Additionally, the Agency performed an in-depth review of the glyphosate cancer database, including data from epidemiological, animal carcinogenicity, and genotoxicity studies.

The ecological risk assessment indicates that there is potential for effects on birds, mammals, and terrestrial and aquatic plants. EPA used the most current risk assessment methods, including an evaluation of the potential effects of glyphosate exposure on animals and plants. Full details on these potential effects as well as the EPA's methods for estimating them, can be found within the ecological risk assessment.

To read the draft risk assessments and supporting documents, go to www.epa.gov/ingredients-used-pesticide-products/draft-human-health-and-ecological-risk-assessments-glyphosate. The draft risk assessments and supporting documents will be available in glyphosate's registration review docket EPA-HQ-OPP-2009-0361 on www.regulations.gov in early 2018. EPA will open a 60-day public comment period for the draft risk assessments, evaluate the comments received, and consider any potential risk management options for this herbicide.

EPA is scheduled to publish the proposed interim registration review decision for glyphosate in 2019. The proposed interim registration review decision will outline any proposed mitigation measures to reduce risk, if any are needed. (EPA Update, 12/18/17)

IARC Review of Glyphosate: a Case of Gross Scientific Negligence

Documents seen by Reuters show how a draft of a key section of the International Agency for Research on Cancer's (IARC) assessment of glyphosate underwent significant changes and deletions before the report was finalized and made public. Reuters found 10 significant changes that were made between the draft chapter on animal studies and the published version of IARC's glyphosate assessment.In each case, a negative conclusion about glyphosate leading to tumors was either deleted or replaced with a neutral or positive one. The full story is at: http://www.reuters.com/article/us-who-iarc-glyphosate-specialreport/in-glyphosate-reviewwho-cancer-agency-edited-out-noncarcinogenic-findingsidUSKBN1CO251.

WSSA feels that the IARC review process for glyphosate was flawed and represents a case of gross scientific negligence. There is no question that IARC arrived at their conclusion due to their inclusion of the positive findings from a selection of studies with known limitations, a lack of reproducible positive findings, and the omission of the negative findings from credible and reliable research. http://wssa.net/wp-content/uploads/WSSA-comments-to-FIFRA-SAP-on-glyphosate.pdf.

On November 9, 2017, updated results from the Agricultural Health Study regarding glyphosate use and cancer incidence were published in the Journal of the National Cancer Institute: https://academic.oup.com/jnci/advance-article/doi/10.1093/jnci/djx233/4590280. The Agricultural Health Study (https://aghealth.nih.gov/) has monitored the health outcomes of over 89,000 licensed pesticide applicators and their spouses from Iowa and North Carolina since 1993. In this large, prospective cohort study, no association was apparent between glyphosate and any solid tumors or lymphoid malignancies overall, including NHL and its subtypes. Specifically, among 54,251 applicators, 44,932 used glyphosate, including 5,779 incident cancer cases. In unlagged analyses, glyphosate was not statistically significantly associated with cancer at any site. (WSSA Newsletter, January, 2018)

Dicamba-tolerant Crop Labels Revised for 2018

On October 13, 2017, the Environmental Protection Agency announced label changes for XtendiMax, Engenia, and FeXapan herbicides. These label changes impose the following additional requirements for 2018:

- Classifying products as "restricted use," permitting only certified applicators with special training, and those under their supervision, to apply them; dicamba-specific training for all certified applicators to reinforce proper use;
- Requiring farmers to maintain specific records regarding the use of these products to improve compliance with label restrictions;
- Limiting applications to when maximum wind speeds are below 10 mph (down from 15 mph) to reduce potential spray drift;
- Reducing the times during the day when applications can occur (sunrise to sunset);
- Including tank clean-out language to prevent cross contamination; and
- Enhancing susceptible crop language and record keeping with sensitive crop registries to increase awareness of risk to especially sensitive crops nearby.

The Restricted Use classification applies only to the labeled uses for XtendiMax, Engenia, and FeXapan. Pre-existing dicamba herbicides (e.g. Clarity, Banvel) are not subject to the Restricted Use classification. For more information: https://www.epa.gov/ingredients-used-pesticideproducts/registration-dicamba-usegenetically-engineered-crops.

The updated labels can be found at:

- Engenia Herbicide, EPA Reg. No.: 7969-345 https://www3.epa.gov/pesticides/chem_search/ppls/007969-00345-20171012.pdf.
- XtendiMax with VaporGrip Technology, EPA Reg. No.: 524-617 https://www3.epa.gov/pesticides/chem_search/ppls/000524-00617-20171012.pdf.
- FeXapan herbicide plus VaporGrip Technology, EPA Reg. No.: 352-913

https://www3.epa.gov/pesticides/chem_search/ppls/000352-00913-20171016.pdf.

For up to date information on tank mixes and nozzles:

- www.engeniatankmix.com.
- http://www.xtendimaxapplicationrequirements.com/.
- www.fexapanapplicationrequirements.dupont.com.

EPA will continue to work with state lead agencies and university weed scientists to solicit information and research on physical drift, tank contamination, temperature inversions, volatility, and misuse with the overarching goal to minimize off-target movement and reduce incidents for the 2018 growing season. During the Pesticide Program Dialogue Committee (PPDC) meeting in November, EPA stated that it "will monitor the success of these changes to help inform our decision whether to allow the continued use of dicamba on tolerant soybean and cotton beyond the 2018 growing season." (WSSA Newsletter, January, 2018)

Problems with Herbicide-resistant Weeds Become Crystal Clear

Herbicide-resistant weeds are threatening food security, but University of Queensland researchers are one step closer to a solution after a new discovery.

A UQ School of Chemistry and Molecular Biosciences study led by Associate Professor Luke Guddat uncovered how penoxsulam, the active ingredient in the world's largest-selling rice herbicide, works.

"Penoxsulam controls weeds such as key grass, broadleaf and sedge, and has become a focus of research due to an increased number of weeds that have developed resistance to herbicides," Dr Guddat said.

"Understanding how it works will assist in managing herbicide resistance not only for rice growers but also for wheat, turf and wine producers globally.

"These compounds have been shown to have extremely low levels of toxicity to the environment."

The researchers hope the discovery will contribute to the design of the next generation of safe and commercially effective herbicides to counter the growing number of weeds becoming resistant.

Herbicide-resistant weeds result in lost income for the world's crop producers despite the $30 billion they spend on herbicides each year, threatening food security.

The research conducted by Dr Thierry Lonhienne and PhD student Mario Garcia used crystallographic studies to capture the molecular mechanisms of the herbicide in action.

"We discovered penoxsulam combines with an enzyme in the weed and prevents it from carrying out its normal function, which is to produce amino acids, the fundamental building blocks of proteins." Dr Guddat said.

"Luckily, humans and other animals don't have that enzyme so penoxsulam compounds are relatively safe at the concentrations used in field applications." (University of Queensland, 2/14/18)

Scientists Identify Factors Which Drive the Evolution of Herbicide Resistance

- Scientists from the University of Sheffield have identified what is driving crops resistance to herbicides on a national scale.
- The costs of weed management have doubled due to evolved herbicide resistance.
- Farms that use greater volume of herbicide have more resistance.
- New findings could have an important impact on medicine as well as agriculture.

Scientists from the University of Sheffield have identified factors which are driving the evolution of herbicide resistance in crops – something which could also have an impact on medicine as well as agriculture.

Xenobiotic chemicals, such as herbicides, fungicides, insecticides and antibiotics, are used in both agriculture and healthcare to manage pests and diseases. However, resistance has evolved to all these types of xenobiotics, rendering them ineffective with serious consequences for crop production and health.

The new study, led by researchers from the University of Sheffield's Department of Animal and Plant Sciences in collaboration with Rothamsted Research and the Institute of Zoology, Zoological Society of London, gives an important insight into how we can learn from past management of agricultural systems to reduce the likelihood of resistance evolving in the future.

Current strategies for managing resistance revolve around diversifying management and the range of chemicals used. Similar techniques have been proposed in medicine and agriculture but there is not yet a consensus on what is the best approach.

In the new study, published in Nature Ecology and Evolution, researchers examined the evolution of herbicide resistance in black-grass (*Alopecurus myosuroides*) in the UK. This has become a widespread weed present in 88 per cent of 24,824 of quadrats – small areas of habitat selected at random as samples for assessing the local distribution of plants and animals – monitored by researchers. It has spread northward in recent years and the scientists found the weed in areas where it had not been found in previous decades.

Lead author of the study Rob Freckleton, Professor of Population Biology from the University of Sheffield, said: "The driver for this spread is evolved herbicide resistance: we found that weeds in fields with higher densities are more resistant to herbicides.

"Once resistance has evolved it does not seem to go away: two years later, fields with high densities still had high densities, despite farmers employing a suite of different management techniques.

"We estimate that the economic costs of this are very high: the costs of weed management have doubled as a consequence of evolved resistance."

The research offer important insights into diversifying management which is suggested as a possible technique for reducing the evolution of resistance. The study showed the technique will work to reduce resistance only if farmers reduce their inputs of herbicides. If they continue to use the same levels of herbicides or even increase their input, then this technique will not work.

The new findings show the volume and diversity of herbicide products are positively related to each other.

Professor Freckleton said: “The results were simple: farms that used a greater volume of herbicide had more resistance.

“Beyond this we found little evidence for a role of any other management techniques: neither the diversity of chemicals used – for example whether farmers used a variety of herbicides or just one – or diversity of cropping mattered, despite both being advocated as methods to reduce the evolution of resistance.”

He added: “New techniques such as precision agriculture (PA) offer the possibility of targeted applications of chemicals: for example, robots could give doses of herbicide at the level of individual plants.

“In the meantime, the results that we have obtained suggest a simple rule of thumb: just using more herbicide will select for more resistance.”

The study showed that even in the absence of chemicals, directional selection from the repeated use of the same management will lead to evolution resistance. This highlighted a need to design a management system in which evolution is anticipated. Apart from focusing on densities and yields, there needs to be an appreciation of resistance.

“In an example of convergent evolution, one ecotype of the weed barnyardgrass (*Eichochloa crus-galli* var oryzicola L.) appears indistinguishable from domesticated rice (*Oryza sativa* L.),” said Professor Freckleton.

“Barnyardgrass is a weed because it reduces the yields of rice, so when farmers see weeds they pull them out. This behavior has been selected for weeds that mimic the crop, as weed plants that look similar to rice avoid being killed.

“This is evolved resistance: when we manage natural systems in a selective manner, evolution is inevitable.” (University of Sheffield, 2/13/18)

Crop-saving Soil Tests Now at Farmers' Fingertips - On-site Pathogen Analysis is Accurate, Quick and Inexpensive

Soil pathogen testing - critical to farming, but painstakingly slow and expensive - will soon be done accurately, quickly, inexpensively and onsite, thanks to research that Washington State University scientists plant pathologists are sharing.

As the name implies, these tests detect disease-causing pathogens in the soil that can severely

devastate crops.

Until now, the tests have required large, expensive equipment or lab tests that take weeks.

The soil pathogen analysis process is based on polymerase chain reaction (PCR) tests that are very specific and sensitive and only possible in a laboratory.

The new methods, designed by WSU plant pathologists, are not only portable and fast, but utilize testing materials easily available to the public. A paper by the researchers lists all the equipment and materials required to construct the device, plus instructions on how to put it all together and conduct soil tests.

Responding to growers needs

"We've heard from many growers that the time it takes to obtain results from soil samples sent to a lab is too long," said Kiwamu Tanaka, assistant professor in WSU's Department of Plant Pathology. "The results come back too late to be helpful. But if they can get results on site, they could make informed decisions about treatments or management changes before they even plant their crop."

Some diseases from soil pathogens may not be visible until weeks after the crop has sprouted, Tanaka said. That could be too late to treat the disease or could force farmers to use more treatments.

Magnetic breakthrough

WSU graduate student Joseph DeShields, a first author on the paper, said it took about six months of work to get their device to work in the field. It relies on magnets to capture pathogens' DNA from the soil.

"It turns out, it's really hard to separate and purify genetic material from soil because soil contains so much material for PCR tests," said DeShields. "So we were thrilled when we made that breakthrough."

Rachel Bomberger is a WSU plant diagnostician who helped with the concepts of the machine testing. She said she's impressed by what Tanaka and the team accomplished.

"We removed a huge stumbling block when it comes to soil testing," said Bomberger, one of the co-authors on the paper. "We found the missing piece that makes the testing systems work in the field without expensive lab equipment or testing materials."

Worldwide application

The system was tested on potato fields around eastern Washington, Tanaka said, but it will work on soil anywhere in the world.

"It's a really versatile method," he said. "You could use it for nationwide pathogen mapping or look at the distribution of pathogens around the country. We started small, but this could have huge implications for testing soil health and disease."

Tanaka said it was important for this discovery to be available in an open-access video journal.

"We're always concerned about helping every grower and the industry as a whole," Tanaka said. "We want everybody to look at this and use it, if they think they'll benefit from it." (Washington State University, 2/26/18)

Pesticide Registrations and Actions

- The FDACS has accepted the revised labeling under section 24(c) of FIFRA to meet the special local need for the preemergence and postemergence use of Chateau Herbicide SW (EPA Reg. No. 59639-99, EPA SLN No. FL-080007) to control weeds between rows of transplanted or seeded fruiting vegetable crops, okra, cucurbit vegetable crops, and head and stem vegetable crops grown using a raised bed plastic mulch production system. (FDACS letter 11/30/17)

- EPA SLN No. FL-890040 has been assigned as the special local need registration number for Alco Citrus Fix (isopropyl ester of 2,4-D dichlorophenoxyacetic acid), Plant Growth Regulator (EPA Reg. No. 5481-145) on citrus in Florida. (FDACS letter 12/5/17)

- The FDACS has granted the extension to the EUP No. FL16-EUP-01 for the Experimental Use Permit of A12460 grass herbicide, (fluazifor-p-butyl); unregistered, to evaluate the efficacy of an unregistered product against torpedograss and other species in aquatic areas of Florida. The extended permit is authorized through December 31, 2018. (FDACS letter 2/5/18)

- The EPA, under the provisions of section 18 of FIFRA, has issued a specific exemption for the use of Torac® Insecticide (tolfenpyrad), to manage thrips on fruit and vegetable crop group 8-10. This emergency exemption (File Symbol 18-FL-04) will expire March 1, 2019. (FDACS letter 1/23/18)

- The EPA, under the provisions of section 18 of FIFRA, has issued a specific exemption for the use of Belay® Insecticide (clothianidin), EPA Registration Number 59639-150, to manage the transmission of Huanglongbing disease in citrus trees. This disease is vectored by the Asian citrus psyllid, a non-native insect species. This emergency exemption (File Symbol 17FL01) will expire October 31, 2018. (FDACS letter 1/22/18)

- EPA SLN No. FL-180002 has been assigned to Fyfanon® ULV AG (malathion) EPA Reg. No. 279-3540 to control Caribbean fruit fly on peaches in Florida. (FDACS letter 2/28/18)

- The EPA, under the provisions of section 18 of FIFRA, has issued a specific exemption for the use of FireLine™ 17WP (oxytetracycline hydrochloride), EPA Registration Number 80990-1, Mycoshield® (oxytetracycline, calcium complex), EPA Registration Number 55146-97, and FireWall™ 50WP (streptomycin sulfate), EPA Registration Number 80990-3, to manage Huanglongbing disease in citrus trees. The emergency exemption (File Symbol 18FL01 for oxytetracycline and 18FL02 for streptomycin) will expire December 31, 2018. (FDACS letter, 1/19/18)