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Chemically Speaking

Pesticide Information Office / P. O. Box 110710 / Building 164 / Gainesville, Florida 32611-0710 / Tel. (352) 392-4721

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Monsanto Ends EU GM Applications

Matching BASF's move in 2012, Monsanto announced in mid-July that it would withdraw all applications to grow new genetically-modified crops in Europe. The decision related to pending requests to grow GM maize, soybean and sugar beet. Monsanto will continue to apply for EU approval for import of its genetically modified crop varieties from the U.S.A. and South America into Europe.

Monsanto said it would invest heavily in its European seed business in the coming years in order to boost sales of its other products. Non-GM seed and other farm inputs account for more than 98 percent of its $1.72 billion annual receipts in Europe. "People have said we are exiting the GMO business in Europe, but we don't really have a business," Monsanto's President and Managing Director for Europe" Jose Manuel Madero said.

"Conventional seeds is the area where we are focusing at this time in Europe, and we are funding the business in a way that we haven't done for more than 15 years." The company is investing $300 million expanding its existing seed production facilities in France, Romania, Hungary and Turkey, and has plans to spend "several hundred million dollars" more over the next five years, Madero said.

The bulk of that future investment is destined for Ukraine, where Monsanto expects to have its largest seed production plant in Europe within five years after earmarking an initial $150 million investment, which could rise to $300 million within several years. Ukraine is a major global grain producer and is forecast to export 14.5 million tons of maize this year. The country currently imports around half of the seed it needs to produce its annual maize crop, but Monsanto said its plant would reduce that dependence by about a fifth. (*BBC News*, 7/18/13 & *Reuters*, 7/18/13).

Early Pesticide Exposure Leads to Greater Adult Tolerance

Amphibians exposed to insecticides early in life - even those not yet hatched - have a higher tolerance to those same insecticides later in life, according to a recent University of Pittsburgh study. Published in *Evolutionary Applications*, the Pitt study found that wood frog populations residing farther from agricultural fields are not very tolerant to a particular type of insecticide, but they can become more tolerant with early exposure. "This is the first study to show that tadpole tolerance to insecticides can be influenced by exposure to insecticides extremely early on in life - in this case, as early as the embryonic stage," said study principal investigator Rick Relyea, Pitt professor of biological sciences and director of the University's Pymatuning Laboratory of Ecology.

The team examined three potential factors that might allow larval wood frogs to have a high tolerance to the insecticide: the concentration of the initial insecticide exposure, the timing of the exposure, and the population's history of exposure. They chose to work with carbaryl, a popular household insecticide that also is used for malaria prevention. The researchers conducted experiments with both embryos and hatchlings that were collected as newly laid eggs from four Pennsylvania ponds - two near agricultural fields and two farther away. Both embryos and hatchlings from all four environs were first exposed to a low, nonlethal concentration of the insecticide. Later, they exposed the same individuals to a lethal concentration of the insecticide at the tadpole stage and measured the tadpoles' mortality rates over the course of several weeks.

Next, the team wanted to observe whether insecticide tolerance played a role in the frogs' acetylcholinesterase (AChE), a key enzyme in the nervous system of animals. Carbaryl is known to bind itself to this AChE enzyme in frogs, causing their nervous systems to slow. The Pitt team measured the concentration of total tadpole AChE in a sample of tadpole bodies, finding that low exposure levels of carbaryl stimulated the tadpoles to produce greater amounts of the enzyme, thus making them more tolerant to the insecticide later in life. (University of Pittsburgh News, 7/29/13).

EU Banning Fipronil

The European Union added a pesticide made by German chemical firm BASF to its list of substances suspected of playing a role in declining bee populations. Member governments banned the use of agricultural insecticide fipronil to treat corn and sunflower seeds. The restrictions take effect from December 31 but seeds which have already been treated can be sown until the end of February 2014.

The ban follows similar EU curbs imposed in April on three of the world's most widely used pesticides, known as nicotinoids, and reflects growing concern in Europe over a recent decline in the population of honeybees. A scientific assessment from the EU's food safety group EFSA said in May that fipronil posed an "acute risk to honeybees when used as a seed treatment for maize."

Fipronil, mainly sold under the Regent® brand name in Europe, may still be used on seeds sown in greenhouses, or leeks, shallots, onions and other vegetables that are harvested before they flower, posing a low risk to foraging bees.

BASF said in a statement it disagreed with the decision and remained convinced the decline in bee numbers was due to other factors. "We will support the European Commission in the development of extensive measures that can benefit bees while securing food production in Europe. We do not believe that the planned restriction of fipronil uses will accomplish that," said Juergen Oldeweme of BASF's Crop Protection division.

In a mid-July vote of the EU's standing committee on the food chain and animal health (SCFCAH), the ban was backed by 23 member states, with three abstentions. Spain and Romania - where fipronil is used commercially - opposed the measures. Unlike the banned nicotinoids, fipronil is not widely used in Europe, with only three other EU countries currently using it for maize production besides Spain and Romania.

Scientists are divided on the part played by pesticides such as nicotinoids in the sharp decline in bee numbers in Europe in recent years. The European Commission says pesticides are one of several factors which may be responsible, along with parasites, diseases and shrinking habitats.

"Today's agreement with member states ... marks another significant step in realizing the Commission's overall strategy to tackling Europe's bee decline," EU health chief Tonio Borg said in a statement. (*Reuters*, 7/16/13).

Pesticides in Pollen Increase Bee Infection

Scientists from the U.S. Department of Agriculture and University of Maryland identified a possible culprit for the deaths of honeybees - pollen contaminated with a mixture of pesticides, which can increase the likelihood of death by parasite. The research article, published in *PLOS ONE* in late July is entitled: "Crop Pollination Exposes Honeybees to Pesticides Which Alters Their Susceptibility to the Gut Pathogen *Nosema ceranae*." The research funding was provided by the USDA and the National Honey Board, an industry group. The research aimed to identify what pesticides bees come in contact with and end up bringing back to

the hive. It also explored how pesticide blends affect the insects' susceptibility to infection from parasites.

Researchers collected pollen from hives on seven crops grown on the East Coast. Fungicides were present in both crop and non-crop pollen collected by bees. In the study, one pollen sample contained an average of nine different pesticides, ranging as high as 21 kinds in one cranberry field. In an unrelated and more expansive study, a scientist discovered 7.1 pesticides per sample.

"While multiple studies have shown negative effects of specific pesticides on honeybee individual and colony health and high pesticide exposure, ours is the first to demonstrate how real world pollen-pesticide blends affect honeybee health," the report states. The report says the combination of exposure to pesticides and infection is potentially lethal for bees. The Nosema parasite infection was twice as likely in bees that consumed fungicides than in bees that did not. Bees that consumed a pollen containing pyraclostrobin were three times more likely to be affected by a pesticide, which can result in death. (*Berkshire Eagle*, 7/31/13).

Analyses Reveal Herbal Pesticide Residues

Extremely high levels of pesticides have been found in traditional Chinese herbs sold in Hong Kong and on the mainland, based on reported analyses. Of those sold in Hong Kong, one herb - san qi root powder - was found to contain 31 different types of pesticide. And in another - *Angelica sinensis* - the level of phorate, a restricted pesticide, was found to be 30 times the European safe limit. Both are common health supplements. Greenpeace tested seven Chinese herbs sold in Hong Kong's Beijing Tongrentang stores and 56 herbs from other large retailers in eight mainland cities over the past year. Pesticide residue was found in 74 percent of the samples. Of these 48 samples - five from Hong Kong - half contained more than 10 different pesticides. Some of the pesticides have been banned for more than a decade.

The worst contaminated sample was san qi flower bought from a branch of Tongrentang in Beijing, which had 39 types of pesticide. Residue levels in some samples were hundreds of times above the European Union's food safety limits, the report said. Hong Kong has restrictions on nine kinds of pesticide residue, but not on any of the ones found in the five Hong Kong samples.

Other herbs found to contain pesticide residue that are on sale in Hong Kong are honeysuckle and wolfberry. Both were tainted by 12 kinds of pesticides, including the banned substance carbofuran, which was found in both. The use of chemical pesticides has become more common on the mainland as plantation sizes increase in response to rising global demand for Chinese herbs.

Plantation visits found that many farmers were unaware of the harmful effects of pesticides on their own and consumers' health, and on the environment. In Shandong's Pingyi county, where honeysuckle is grown, the farmers are mostly over the age of 50 and do not know how to use pesticides scientifically. Growers often take the advice of local shops, which tend to recommend highly toxic pesticides. (*South China Morning Post*, 6/25/13).

Pesticide Registrations and Actions

Food Related Actions

- On May 28, the Florida Department of Agriculture and Consumer Services (FDACS) issued the special local needs registration for the insecticide malathion (Malathion 57%®) for control of spotted wing drosophila on high bush blueberry. The EPA registration number and SLN number for the Cheminova product are 67760-40 and SLN FL-130002, respectively. (FDACS PREC Agenda, 7/11/13).

- On May 28, the FDACS issued the special local needs registration for the insecticide malathion (Fyfanon ULV®) for control of spotted wing drosophila on high bush blueberry. The EPA registration number and SLN number for the Cheminova product are 67760-35 and SLN FL-130003, respectively. (FDACS PREC Agenda, 7/11/13).

- On June 7, the FDACS registered the insecticide sulfoxaflor (Closer®) to control pests on vegetables, fruits, nuts and other crops. The EPA registration number for the Dow AgroSciences product is 62719-623. (FDACS PREC Agenda, 7/11/13).

- On June 7, the FDACS registered the insecticide sulfoxaflor (Transform®) to control pests on vegetables, fruits, nuts and other crops. The EPA registration number for the Dow AgroSciences product is 62719-625. (FDACS PREC Agenda, 7/11/13).

- On June 7, the FDACS registered the biological nematicide *Pasteuria spp.* Pr-3 (Naviva ST®) to control nematodes for seed treatment application. The EPA registration number for the Pasteuria BioSciences product is 85004-5. (FDACS PREC Agenda, 7/11/13).

- On July 11, the FDACS registered the plant growth regulator S-abscisic acid (Contego®) to reduce transplant shock in vegetables. The EPA registration number for the Valent BioSciences product is 73049-493. (FDACS PREC Agenda, 8/1/13).

- Based on a request by IR-4, tolerances have been granted for residues of the miticide fenpyroximate (Portal®) in stone fruit, small climbing fruit, and tuberous and corm vegetables. (*Federal Register*, 6/17/13).

- Based on a request by IR-4, tolerances have been granted for residues of the insecticide acetamiprid (Assail®) in sweet corn kernel plus cob with husks removed, as well as stover and forage. (*Federal Register*, 6/19/13).

- Based on a request by IR-4, tolerances have been granted for residues of the herbicide imazosulfuron (League®) in melon (subgroup 9A) and tuberous and corm vegetable (subgroup 1C). (*Federal Register*, 7/24/13).

- Based on a request by Syngenta, tolerances have been granted for the fungicide cyproconazole (Alto®) in peanut and peanut hay. (*Federal Register*, 6/21/13).

- Based on a request by Makhteshim-Agan North America, tolerances have been granted for the insecticide novaluron (Rimon®) in peanut and soybean seed. (*Federal Register*, 7/3/13).

- Based on a request by Dow AgroSciences, a tolerance has been granted for the fungicide fenbuconazole (Indar®) in pepper. (*Federal Register*, 7/3/13).

Other Actions

- In response to several bumblebee kills that occurred in Oregon, the state legislature has banned the use of all products that contain dinotefuran on ornamental and trees in the state. (*KPTV*, 6/27/13).

- The American Soybean Association (ASA) submitted comments in July in response to the May announcement from the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) that the agency would prepare additional Environmental Impact Statements (EISs) for soybeans and corn resistant to 2,4-dichlorophenoxyacetic acid (2,4-D), and soybeans and cotton resistant to dicamba. Biotechnology has allowed plant breeders to develop soybeans that are tolerant to herbicides, thus allowing soybean farmers to better control weeds and implement no-till and conservation tillage practices that save fuel, reduce erosion, and protect the environment. Biotech soybeans have been grown since 1996, and in the 2012 crop year, approximately 94 percent of the soybeans planted in the United States were biotechnology-derived according to ASA. (*AgriMarketing.com*, 7/19/13).

Pesticide Potpourri

- Take a few minutes to complete the IR-4 Ornamental Horticulture Program Survey. This survey helps to identify local, regional and national pest management holes where there are limited or no tools to manage disease, pest, and weed populations. It also identifies key crops where crop safety information is needed. As a grower of greenhouse flowers, nursery stock, Christmas trees, or herbaceous perennials, there are some situations where pest control materials that will give reliable control do not exist. Identify those situations on the survey to help direct researchers to work toward solutions. Pesticide resistance, invasive species, changing pest populations, and crop safety (phytotoxicity) are issues that contribute to pest control problems in our industries. The outcomes from this survey will serve as discussion points for the

2014/2015 IR-4 Ornamental Horticulture Program priorities for national and regional research projects. The survey will close August 31, 2013. Please take a few minutes today to voice your needs for pest management tools. The link to the survey is: ir4.rutgers.edu/Ornamental/Survey/index.cfm

- With the decline in Florida's citrus harvest predicted within the decade, some believe that altering the orange's DNA would save it from citrus greening. In early July, Florida's citrus crop was forecast to be in a 9 percent decline from last year due to the disease.

Citrus greening is found in all of Florida's 32 commercial citrus-producing counties, which have 550,000 acres of groves. The bacterium, spread by the Asian citrus psyllid, often kills trees within a couple of years. (*South Florida Business Journal*, 7/29/13).

Mark Mossler
Doctor of Plant Medicine
plantdoc@ufl.edu

Fred Fishel
Professor & Pesticide Coordinator
weeddr@ufl.edu

Linda Kubitz
Information & Publications Coordinator
llk@ufl.edu

UNIVERSITY OF FLORIDA

Institute of Food and Agricultural Sciences
Cooperative Extension Service
Pesticide Information Office
P.O. Box 110710
Gainesville, FL 32611-0710