



# Chemically Speaking

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## Table of Contents

	Page
NPIC Funding.....	1
Pesticide Residue Violations – 1st Quarter 2014.	2
Mosquito Pesticides/Shellfish .....	3
DuPont Sued Over GAT.....	4
Pesticide Registrations and Actions .....	5
Food Related Actions .....	5
Pesticide Potpourri .....	6

## NPIC Funding

A new five-year \$5 million grant from the U.S. Environmental Protection Agency will fund expanded online services like more mobile applications, interactive content and video tutorials regarding proper pesticide application offered by the National Pesticide Information Center (NPIC) at Oregon State University (OSU). The center, which already operates a national hotline, will also offer webinars for the medical community and state and federal regulators with the new grant.

“The award represents a new vision for

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our national service that emphasizes modern online and mobile delivery. We want to be where people are when they need us,” said Kaci Buhl, project coordinator for the center. “Online content allows us to better fulfill our mission of limiting the misuse of pesticides, reducing risk and promoting public health.” OSU has operated the national service since 1995, which is funded by the EPA in three- to five-year cycles. Last year, more than 1.8 million visitors accessed NPIC's website, which received more than 32 million overall hits. The service also answered questions from more than 17,000 people by phone and email.

The NPIC has also launched four mobile-friendly apps. The most popular, the Pesticide Education and Search Tool, offers quick, bulleted information on more than a dozen common pests. The four apps aim to be immediately accessible to users and suggest alternatives to pesticides for common urban pests, like fleas and rodents. The NPIC's toll-free hotline is available in more than 170 languages. Each submitted question is handled by an expert with advanced training in toxicology, food safety, veterinary medicine or other scientific field. The NPIC also collects data on pesticide incidents to inform national surveillance systems. The hotline can be reached at 1-800-858-7378 from 8 a.m. to 12 p.m. Pacific time Monday through Friday. (*Farm Futures*, 5/16/14).

## **Pesticide Residue Violations – 1st Quarter 2014**

The Florida Department of Agriculture and Consumer Services, Chemical Residue Laboratories, conducts pesticide residue testing of fresh fruits and vegetables with a focus on Florida-grown products. The table below lists Florida grown commodities found adulterated. Only a small fraction of all samples tested were violative and those found were at very low levels. Our labs conduct follow-up investigations to identify and verify the source of the contaminated crop and remove it from distribution. The Division of Agricultural Environmental Services conducts misuse investigations to assist in correcting any pesticide misuse problems.

Careful application of pesticides according to label directions will avoid violations.

Tolerances can be found on the web at <http://www.ecfr.gov> in 40 CFR 180. We hope that, by posting these findings, additional misuse may be avoided.

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PRODUCT-COMMODITY	ANALYTE_NAME	FOUND (ppm)	TOLERANCE (ppm)
BEANS-SNAP, SUCCULENT	CHLORFENAPYR	0.24	0.01
BEETS-TOPS	CHLOROTHALONIL	0.090	0
BEETS-TOPS *	CHLOROTHALONIL	0.025	0
	CYAZOFAMID	0.053	0
CARAMBOLA	PERMETHRIN TOTAL	0.15	0
CARAMBOLA	PERMETHRIN TOTAL	0.19	0
CILANTRO	CYPRODINIL	13	3.0
CILANTRO	CYPRODINIL	9.5	3.0
CILANTRO	CYPRODINIL	7.4	3.0
CILANTRO	PENDIMETHALIN	0.096	0
PARSLEY	LINURON	0.63	0.25
RADISHES-TOPS	METOLACHLOR	0.025	0
RADISHES-TOPS	METOLACHLOR	0.053	0
SQUASH-SUMMER *	ACEPHATE	2.5	0
	METHAMIDOPHOS	0.052	0
	METHOMYL	0.50	0.20
SQUASH-SUMMER *	ACEPHATE	3.3	0
	DIMETHOATE + OMETHOATE	0.094	0
	METHOMYL	0.55	0.20
SQUASH-SUMMER	DIMETHOATE + OMETHOATE	0.210	0
STRAWBERRIES	CYFLUFENAMID	0.30	0.2
STRAWBERRIES	OXAMYL & OXAMYL OXIME	0.115	0
*Some samples contain multiple violations			

## Mosquito Pesticides/Shellfish

Four of the most common mosquito pesticides used along the east and Gulf coasts show little risk to juvenile hard clams and oysters, according to a new National Oceanic and Atmospheric Administration (NOAA) study. Approximately 200 mosquito species live in the United States. In addition to causing painful itchy bumps to people, mosquito bites can transmit serious diseases such as malaria, dengue fever, and West Nile virus. One approach to controlling mosquitoes is to apply pesticides by spraying from planes or trucks over a large area. However, to effectively control mosquitoes, the pesticides must target species which live in aquatic habitats that are also home to other estuarine species. Since many residential communities where the pesticides may be used are near these coastal aquatic habitats, the potential for direct overspray or unintentional drift into these waters is increased.

The study sought to address a lack of toxicity data for mosquito control pesticide effects on shellfish early life stages. The research team examined the toxicity of four mosquito control pesticides (naled, resmethrin, permethrin, and methoprene) to larval and juvenile life stages of hard clams (*Mercenaria mercenaria*) and Eastern oysters (*Crassostrea virginica*). Lethal thresholds were determined for the four pesticides, and differences in sensitivity were found between chemicals, species, and life stages tested. Overall, clams

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were more susceptible to mosquito control pesticides than oysters. Naled, an organophosphate chemical, was the most toxic compound in oyster larvae, while resmethrin was the most toxic compound in clam larvae. Decreased swimming activity was observed after four days in larval oysters and decreased growth was found in juvenile clams and oysters after 21 days. Using a hazard assessment, which compared the toxicity thresholds to concentrations expected in the environment, the researchers calculated a low-level of risk to clams and oysters from application of these pesticides for mosquito control.

Commercial shellfishing has a large economic national impact. NOAA Fisheries estimated that U.S. oyster and hard clam landings for 2010 were worth nearly \$118 million and \$41 million, respectively. Shellfish growers, however, are concerned that pesticide spraying near the coastlines may contaminate both their hatcheries and source waters. This is compounded by a lack of data on the toxicity of mosquito insecticides for these shellfish. (NOAA, 6/9/14).

## DuPont Sued Over GAT

DuPont, the maker of Pioneer genetically modified corn, was sued for \$1 billion by an investment fund that claims company directors promoted herbicide-resistant crop traits knowing they didn't work. The Ironworkers

District Council of Philadelphia & Vicinity Retirement & Pension Plan contends that some past and present DuPont directors wasted corporate assets and fraudulently promoted a specific gene trait, known as GAT.

Before filing the suit, plaintiff's lawyers issued a legally defined "demand" on DuPont's board "to investigate and commence an action" against directors and executives, court papers show.

A DuPont spokesman said that several months ago DuPont's Board of Directors unanimously rejected the shareholder derivative claims following an independent investigation by former Delaware Chancellor William Chandler and two independent DuPont directors. Turner said they concluded the claims "were not supported by the facts or the law and that pursuing those claims would not be in the best interest of DuPont."

DuPont "with great fanfare" announced in 2006 that in 2009 it would begin selling GAT, which stands for glyphosate acetolactate synthase tolerance, with possible sales of \$200 million a year, according to the complaint. GAT seeds are genetically altered to tolerate weed killers known as ALS herbicides. Soon "field trials of GAT were producing disappointing results" and DuPont "continued to publicly hype GAT" and "conceal the failure," the fund said. In 2009, DuPont disclosed it was adding a Monsanto genetic technology, used to make crops resistant to weedkillers, to its product because the

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combination helped boost crop yields. Monsanto sued and in August 2012 a federal jury in St. Louis awarded Monsanto \$1 billion in damages. (*Bloomberg*, 6/4/14).

## **Pesticide Registrations and Actions**

### **Food Related Actions**

- On April 25, the Florida Department of Agriculture and Consumer Services (FDACS) conditionally registered the pre-plant soil fumigant allyl isothiocyanate (Dominus®) to control fungi, nematodes, weeds and insects on strawberry, pepper, and other field crops. The EPA registration number for the Isagro USA Inc. product is 89285-2. (FDACS PREC Agenda, 6/5/14).
- On April 25, the FDACS registered the seed dressing fungicide combination of penflufen and prothioconazole (Emesto Silver®) to control fungi in seed potatoes. The EPA registration number for the Bayer CropScience product is 264-1123. (FDACS PREC Agenda, 6/5/14).
- On April 25, the FDACS registered the seed dressing fungicide combination of penflufen, metalaxyl, and prothioconazole (Evergol Energy®) to control fungi in listed crops such as beans and rice. The EPA registration number for the Bayer CropScience product is 264-1122. (FDACS PREC Agenda, 6/5/14).
- On May 9, the FDACS registered the seed dressing fungicide tolclofos (Rizolex®) to protect soybean, corn, sorghum, and cotton seedlings. The EPA registration number for the Valent U.S.A Corp. product is 59639-178. (FDACS PREC Agenda, 6/5/14).
- On May 14, the FDACS registered the herbicide combination of bromoxynil and pyrasulfotole (Huskie®) to control broadleaf weeds in grass seed, rye, grain sorghum, and triticale. The EPA registration number for the Bayer CropScience product is 264-1023. (FDACS PREC Agenda, 6/5/14). Based on a request by BASF Corp., the EPA has approved tolerances for the insecticide cyflumetofen. Tolerances of importance to the state include citrus (group 10-10), grape, pecan strawberry, and tomato. (*Federal Register*, 5/21/14).
- The U.S. Department of Agriculture announced in early June a total of \$31.5 million in funding to combat huanglongbing (HLB), commonly known as citrus greening disease, which has threatened to devastate Florida's \$9 billion citrus industry. As many as 70% of Florida's citrus trees are believed to be infected by greening, which is caused by bacteria injected into trees by Asian

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citrus psyllid. (*Reuters*, 6/12/14).

## Pesticide Potpourri

- Pesticide use in the U.S. over the past 50 years has fluctuated – reaching a peak of 632 million pounds in 1981, dipping lower six years later to 468 million pounds and returning to 516 million pounds in 2008, a new USDA study reports. The study, a review of pesticide use on 21 selected crops from 1960 to 2008 – the most recently available data – examines the type of pesticides used over the study time period, as well as the crops on which they are commonly applied. The study affirms that pesticide use is driven by a range of factors, some controllable and others not. Most common factors identified included changes in planted acreage, crop and input prices, weather, pesticide regulations, the introduction of new pesticides and the adoption of genetically engineered seed. Types of pesticide used has also shifted during the study time period, with insecticides representing 58% of the poundage applied in 1960, but only 6% in 2008. Herbicides, the study said, represent the opposite – accounting for 18% of the pounds applied in 1960 but 76% by 2008. Along with use, the price of such inputs has also increased. The report found that total pesticide expenditures in

U.S. agriculture were nearly \$12 billion in 2008, five times more than expenditures in 1960. Finally, USDA researchers determined that the top pesticide-using crop in the U.S. is corn, driven by more acreage on increasing demand for corn as livestock feed and its applications for biofuels. Soybeans, the second-largest user of pesticides in 2008, used herbicides most frequently. Potatoes were the third-largest user of pesticides (*Farm Futures*, 5/20/14).

- A 58-year-old woman is dead after exposure to phosphine gas. The incident happened in Wadley, Georgia. After investigating the incident, it was discovered that a relative of the woman distributed an agricultural insecticide (Fumitoxin®) in her home earlier in the day to kill roaches and other insects. The insecticide released phosphine gas that was inhaled by her and a 12-year-old male that lived with her. The 12-year-old was taken to the hospital then later transported to Georgia Regents Medical Center in Augusta for further care and released. (*WJBF.com* 6/12/14).
- Researchers at the Universities of Dundee and Aberdeen have made a breakthrough in understanding how the microbial spores which cause potato blight are so effective at infecting plants. *Phytophthora infestans* is a highly destructive plant pathogen. It was the cause of the Irish potato famine in the

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nineteenth century and remains to this day a significant global problem with associated costs estimated at \$3billion annually over the globe. Researchers have found that as the spores clump together in water, ganging up to increase the chance of causing infection, they use two mechanisms to attract enough spores to attack plants, and they happen over two different timescales. When millions of zoospores were placed into a petri dish, what researchers saw reminded them of mathematical models they'd seen before that were formed by chemical-sensing patterns. Bio-convection is a sort of swimming pattern seen in the zoospores. It looks like a coffee bean with a fatter bottom, which swim upwards because of gravity. It's a very rapid process that works on the order of minutes. It sets up convective plumes, which are structures in the liquid

pushing the cells to the top where they can group together. The second mechanism was a form of chemical sensing. Similar to animals being attracted to pheromones, the zoospores are able to send chemical signals to draw in other zoospores. The chemical-sensing mechanism happens on the order of 4-5 hours. If there are a number of plumes in a water drop formed by bio-convection, then the chemical sensing draws these plumes together until you get one super plume, to really drive in the infection. (*Farming Online*, 6/12/14).



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