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Chemically Speaking

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Table of Contents

Bees & Nicotinoids

Beekeepers in Canada have filed a class-action lawsuit against the manufacturers of insecticides they believe are harming pollinating insects. Beekeepers from Ontario, Canada (OBA) are seeking damages from historical and continued use of nicotinoid insecticides, which they claim have been killing or weakening bees and affecting queens' fertility. Sun Parlor Honey and Munro Honey filed their lawsuit on September 2 against Bayer CropScience and Syngenta. Since the case was filed, many smaller producers have reportedly joined.

Lawyers representing the two producers from law firm Siskinds LLP said others can still sign onto the lawsuit. They claim the companies named have been "Negligent in their design, manufacture, sale and distribution of neonicotinoids," Which the Ontario Beekeeping Association believes has

"caused beekeepers to suffer significant losses and damage." Though the claims have not yet been tested in court, the apiarists are seeking damages dating back to 2006.

Nicotinoid pesticides have been applied to 4.2 million acres in Ontario (over 95 percent of maize seeds and 65 percent of soy seeds). The OBA claims that the link between nicotinoid use and colony losses has been confirmed by government public health body Health Canada. The Canadian Association of Professional Apiculturists reported that Ontario beekeepers lost 58 percent of their hives last winter - more than three times the average of the rest of Canada. According to OBA President, Dan Davidson, beekeepers are also reporting significant summer losses this year.

Ontario's provincial agriculture minister Jeff Leal announced that the government is considering introducing a licensing system to monitor the use of neonicotinoids and target the products' applications to cases where there is a "demonstrated need" for the 2015 planting season. The government's Pest Management Regulatory Agency is also currently reviewing the controversial pesticides.

"While the OBA is not directly involved in this action, we support any effort that could help beekeepers recover losses caused by the overuse of neonicotinoids," Ontario Beekeeping Association spokesperson Tibor Szabo said on Tuesday. "This Action puts the blame where it belongs - on the pesticide manufacturers."

Meanwhile, the U.S. Agriculture Department and the EPA last May concluded that nicotinoids, while a possible contributor, were way down the list of possible causes. They cited as the primary drivers colony management, viruses, bacteria, poor nutrition, genetics and habitat loss. By far the biggest culprit - the report called it “the single most detrimental pest of honeybees” was identified as the parasitic mite *Varroa destructor* - the likely cause of the 2004 die-off. That report echoed findings published in 2013 by the United Kingdom’s Department for Environment, Food and Rural Affairs (DEFRA), which evaluated the cause of bee deaths as the European Union was debating whether to institute a ban. DEFRA noted that the bees used in many of these lab experiments were exposed to doses hundreds of times higher than what they encounter in the wild, and they were often administered by injections. In voting for a moratorium, European Commission politicians ignored DEFRA’s analysis. It later emerged that EFSA appeared to have deliberately suppressed evidence of the relative safety of nicotinoids after insider political lobbying by French officials. After the vote, Director-General of EFSA, Catherine Geslain-Lanéele resigned to take up a job at the French Ministry of Agriculture, which had lobbied for a ban over the objections of Britain, Germany and other countries.

A recent study issued by scientists affiliated with USDA and the Chinese Academy of Agricultural Sciences concluded that honeybee deaths (and likely bumblebee deaths as well) stem from the tobacco ringspot virus (TRSV), not from pesticides. It’s long been known that foraging bees pick up the virus; what’s new is that researchers discovered that the virus has evolved the ability to infect bees, and it now attacks their nervous systems. TRSV then spreads to other bees - a process known as “host shifting”- by the mites that feed on them.

After the European Commission voted, activist groups turned their focus on Canada, pressuring it to follow suit. The responsible agency, Health Canada’s Pest Management Regulatory Agency (PMRA), issued a vague “notice of intent” order to

regulate nicotinoids, without providing details. However, if bee health problems were critical in Canada, they would certainly have surfaced in the country's 19 million acres of canola farms, which are mostly in the west. Beekeepers who forage their bees in the canola fields, where neonics are used far more heavily than on Ontario and Quebec farms, say their hives are generally thriving. Apart from a single, ambiguous case, there have been no reports of bee kills attributable to neonics in all of western Canada in recent years.

The PMRA could also have drawn upon previous studies, including three major field investigations on nicotinoid pesticides in 2002, 2005 and 2012 by environmental biologist Cynthia Scott-Dupree of the University of Guelph and entomologist Chris Cutler of Dalhousie University. The researchers noted residues of nicotinoids in ailing bee hives, but at levels hundreds of times lower than scientists believe would have any impact on bees. Their conclusion echoed recent findings by DEFRA, USDA and EPA: many factors contribute to bee deaths, but neonics in particular had "no effects" on their poor performance. While Scott-Dupree and Cutler's field research is widely recognized as among the most robust in the world in evaluating real world impacts of these pesticides, pressure from the Sierra Club allied with organic-focused beekeepers resulted in lack of invitation to discuss the issue

In Europe, where the nicotinoid moratorium just took effect, farmers have had no choice but to return to older and less effective pesticides: organophosphates and pyrethroids. The dangers of organophosphates, which are highly toxic to bees, are widely known. A study of pyrethroids by the Royal Holloway University of London published in the *Journal of Applied Ecology* recently is the first to examine the impact of the pesticide across the entire lifecycle of bumblebees and found that use impairs brood reproduction and stunts growth, which is disastrous for bee health. "Our work provides a significant step forward in understanding the detrimental impact of pesticides other than neonicotinoids on wild bees," said co-author Nigel Raine. The scientists expressed particular concern that patchwork bans and moratoriums could result in stressing bee colonies even more.

In reviewing the emerging evidence on challenges to bee health, University of Illinois entomologist May Berenbaum, chairwoman of a major National Academy of Sciences study on the loss of pollinators, said recently that she was "extremely dubious" that banning nicotinoids would have any positive effect. The key challenges to bee health going forward, entomologists say, are colony management issues, the blood-sucking *Varroa* mite, the miticides beekeepers themselves use to control *Varroa* infestations and various viruses, like TRSV. (*Farming Online* & *AEI*, 9/4/14).

GM Corn Chaos

Cargill has sued Syngenta for allegedly selling genetically modified corn seeds that wound up in China, leading to a crackdown by the Chinese government on all U.S. corn shipments. China hadn't approved the use of the Agrisure Viptera seeds when Syngenta began selling them to U.S. farmers. When China discovered traces of the modified seed on corn-carrying ships, it cut back on shipments of U.S. corn by 85 percent. Cargill, in a suit filed in Louisiana state court, accused Switzerland-based Syngenta of acting irresponsibly.

"Given the prevalence of crops grown from the Viptera seed in the U.S. corn supply, the Cargill Plaintiffs can no longer sell U.S.-grown corn to China," it said in its lawsuit, adding that it lost $90 million as a result. Syngenta said the lawsuit was without merit.

In the U.S., Ingredion Inc, manufacturer of sweeteners and starches made from corn, stated that it will not buy Syngenta's genetically modified Agrisure Duracade corn, which has been shunned by the world's biggest commodity traders because it is not approved by major importers. Ingredion, which sells high fructose corn syrup and corn starch, also is evaluating whether it will accept Agrisure Viptera although it may have accepted it in the past since it was approved in 2010.

The ban puts Ingredion in the company of major traders like Archer Daniels Midland Co and Bunge Ltd, which have said they will not handle Duracade corn because it is not approved by China or the European Union, both major importers. Ingredion's decision further limits the potential markets for farmers who planted Duracade. Syngenta has teamed with grain merchant Gavilon, owned by Japanese trading house Marubeni Corp, to help farmers find approved markets for the GMO crop, which was cleared by U.S. authorities last year. Other buyers, including Mexico and Japan, have approved Duracade imports. (*Minneapolis/St. Paul Business Journal*, 9/15/14 & *Reuters*, 9/18/14).

USGS 20-Year Water Report

Levels of pesticides continue to be a concern for aquatic life in many of the Nation's rivers and streams in agricultural and urban areas, according to a new U.S. Geological Survey study spanning two decades (1992-2011). Over half a billion pounds of pesticides are used annually in the U.S. to increase crop production and reduce insect-borne disease. The proportion of streams with one or more pesticides that exceeded an aquatic-life benchmark was similar between the two decades for streams and rivers draining agricultural and mixed-land use areas (between 45 and 70 percent), but much greater during the 2002-2011 for streams draining urban areas (from 53 percent for 1992-2001 to 90 percent). Fipronil, an insecticide used commonly as a termiticide and disrupts the central nervous system of insects, was the pesticide most frequently found at levels of potential concern for aquatic organisms in urban streams during 2002-2011.

Since 1992, there have been widespread trends in concentrations of individual pesticides, some down and some up, mainly driven by shifts in pesticide use due to regulatory changes, market forces, and introduction of new pesticides. "Levels of diazinon, one of the most frequently detected insecticides during the 1990s, decreased from about 1997 through 2011 due to reduced agricultural use and the U.S. Environmental Protection Agency's regulatory phase-out of urban uses," said, Wesley Stone, USGS hydrologist. With regard to human health, pesticide levels seldom exceeded benchmarks. (USGS release, 9/11/14)

Pesticide Registrations and Actions

Food Related Actions

- On August 20, the Florida Department of Agriculture and Consumer Services (FDACS) registered the miticide

cyflumetofen (Nealta®) to control mites on citrus, grape, strawberry, and pecan. The EPA registration number for the BASF Corporation product is 7969-336. (FDACS PREC Agenda, 10/2/14).

Non-food Actions

- On August 20, the FDACS registered the miticide cyflumetofen (Nealta®) to control mites on ornamentals grown in outdoor nurseries, retail nurseries, residential and commercial landscapes, interiorscapes and greenhouses. The EPA registration number for the BASF Corporation product is 7969-337. (FDACS PREC Agenda, 10/2/14).

Other Actions

- China's Ministry of Agriculture has decided not to renew biosafety certificates that allowed research groups to grow genetically modified (GM) rice and corn. The permits, to grow two varieties of GM rice and one transgenic corn strain, expired in mid-August. The reasoning behind the move is not clear, and it has raised questions about the future of related research in China. The ministry, with much fanfare, had approved the GM rice certificates in August 2009. The permits enabled a group at Huazhong Agricultural University in Wuhan to produce two varieties of rice carrying a gene from the *Bacillus thuringiensis* (Bt) bacteria that provides pest resistance. At the same time, the ministry approved production of a corn strain developed by the Chinese Academy of Agricultural Sciences' Biotechnology Research Institute in Beijing. Researchers had altered the corn so that kernels contain phytase, a livestock feed additive that boosts absorption of phosphorus, which enhances growth. All of the certificates were valid for 5 years. China has nearly reached self-sufficiency in producing rice using conventional varieties, so the ministry has decided there is no need to commercialize Bt rice in the near future, says Huang Jikun, director of the Chinese Academy of Sciences' Center for Chinese Agricultural Policy. The decision marks an abrupt change in fortunes for transgenic rice in China. Huang says this decision does not reflect a change in China's overall policy regarding agricultural biotechnology. The government is increasing its support for Bt corn research, other specialists note; GM corn has faced less public opposition, in part because it is primarily fed to livestock. (*AAAS Science*, 8/20/14).

Pesticide Potpourri

- Agricultural scientists recognized the 50-year anniversary of the national Land-Grant University Pesticide Safety Education Program in 2014. Although the program has evolved over the past 50 years, it remains the focal point for pesticide safety education throughout the United States. The Pesticide Safety Education Program (PSEP) had its genesis in 1964 to enhance pesticide label compliance and to develop the first training manuals. In the early years, the program was under the direction of each Land-Grant University's Cooperative Extension Program and was

supported by the U.S. Department of Agriculture (USDA). In 1970, USDA passed this responsibility to the newly created U.S. Environmental Protection Agency (EPA), which concentrated especially on safety issues on the farm and in other occupations. In 1978, EPA classified the first 12 restricted-use pesticides (RUPs). Applicators were required to demonstrate competency to apply RUPs, and Pesticide Applicator Training (as PSEP was then called) served as the primary developer and deliverer to inform and educate on safe pesticide use. There are many more RUPs, and many states now require whole categories of users to be certified, even if they do not apply RUPs. Examples include certification of hired applicators, public employees and those treating schools or aquatic environments. An estimated 40% of certified applicators in the U.S. today do not apply RUPs. Though it once focused predominantly on the education of applicators controlling agricultural pests, PSEP now teaches applicators working in urban, natural, industrial and other settings. It provides training to those who control weeds, insects, disease-causing organisms, rodents and other pests in forests, structures, turf, ornamentals, rights-of-way, aquatic areas, and other important and sometimes unique "sites." These include food manufacturing and processing establishments, interior plantscapes, pet grooming, pools, public health, seed treatment, sewers, water sanitation, wood preservation and more. In addition, PSEP impacts more than one million pesticide users in the general public who apply pesticides in their homes and on their lawns, gardens, ornamentals and pets. In 2014, approximately 900,000 certified applicators in the U.S. applied pesticides or supervised their use. Many more individuals who did not require certification sold, transported, stored, mixed, applied, disposed or were otherwise involved in the life-cycle management of pesticides. To reach all these audiences, PSEP and its not-for-profit partners provided in-person and on-line training sessions, distance education, manuals, brochures, presentations and videos. The recognition this program deserves is often muted, due to the increasing number of organizations and initiatives that erroneously equate pesticide safety education with promoting pesticide use. (Joint WSSA, APS and ESA press release, 9/15/14).

- A U.S. Magistrate judge overturned Kaua'i County's law regulating the use of pesticides and genetically modified organisms (GMOs) in late August. The judge ruled that it was preempted by Hawai'i state law, although not by federal law. The four chemical companies operating on Kaua'i, DuPont Pioneer, Syngenta, Dow Chemical subsidiary Agrigenetics, and BASF Plant Science - challenged the law in court, arguing that it is invalid and unfairly targets their industry. The county law, Ordinance 960, was passed in November 2013 and would have gone into effect in Augut 2014. It would have required buffer zones between fields spraying pesticides on GMO crops and sensitive areas like schools and hospitals. It also required chemical companies and large farms to disclose types and quantities of pesticides they spray as well as the location of fields growing GMO crops. (*PRWatch*, 8/26/14).

- The California Department of Pesticide Regulation (DPR) announced in early September that once again, the majority of produce it tested annually had little or no detectable pesticide residues and posed no health risk to the public. Approximately 95 percent of all California-grown produce,

sampled by DPR in 2013, was in compliance with the allowable limits. "This is a vivid example that California fresh produce is among the safest in the world, when it comes to pesticide exposure," said DPR Director Brian Leahy. "DPR's scientifically robust monitoring program is an indication that a strong pesticide regulatory program and dedicated growers can deliver produce that consumers can have confidence in." DPR tested 3,483 samples of different fruits and vegetables sold in farmers markets, wholesale and retail outlets, and distribution centers statewide. More than 155 different fruits and vegetables were sampled to reflect the dietary needs of California's residents. Of all 3,483 samples collected in 2013 44 percent had no pesticide residues detected and 52 percent of the samples had residues that were within the legal tolerance levels. Four percent of the samples had illegal residues of pesticides not approved for use on the commodities tested and less than one percent of the samples had illegal pesticide residues in excess of established tolerances. However, a produce item with an illegal residue level does not necessarily indicate a health hazard. (*Western Farm Press*, 9/2/14).

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