Maine Board of Pesticides Control

Miscellaneous Pesticides Articles
February 2016

(identified by Google alerts or submitted by individuals)

From: Carol Laboissonniere [mailto:info@cldesignlandscape.com]
Sent: Thursday, January 28, 2016 7:21 PM
To: Fish, Gary
Cc: Sarah Lachance; Deborah Bauman; alandpals@yahoo.com; Patricia Keller
Subject: FW: Roundup Resistant Grass - Attachment now attached!!

Gary,
This is a follow up to our recent telephone conversation on the Kennebunkport Conservation Commission's effort to reduce pesticide use. The attached article was in Turf Magazine, an industry publication to promote the lawn care business. The article also includes a section on low mow grass which was left in to be able to include the author's information at the end of the article.

We are concerned that the use of this grass will create more indiscriminate use of chemicals on lawns. We would appreciate the Board of Pesticide's thoughts on this issue.

Thank you for your attention to this matter,
Carol Laboissonniere (207-475-7870)
On behalf of the Kennebunkport Conservation Commission members who are copied on this message.

By DOUG BREDE

Scientists regenerate genetically modified, or GM, grass plants from living tissue after new genes are inserted.

Seeds of Disruption

Two technologies are lining up to change the lawn care industry as we know it.

What do these four businesses—Insley, Koehring, Little Giant and Link-Belt—have in common?

In the 1950s, they were major manufacturers of cable-actuated backhoes, or what used to be called steam shovels. They were also among more than 30 manufacturers that failed when an innovative and disruptive technology—hydraulics—emerged in the 1960s.

Firms such as J.I. Case, John Deere, Ford, International Harvester, Caterpillar, Komatsu and Hitachi were the winners—the businesses that jumped into hydraulics and capitalized on this new technology. They endured because they not only accepted change but also used it to their advantage. Disruptive businesses may produce lower gross margins, target smaller markets and provide simpler products and services, says Clayton Christensen, Harvard Business School professor, author and leading thinker on innovation. Disruptive products are initially ones the customer doesn't want and can't use, yet they revolutionize the marketplace, just as hydraulics forever changed the excavator industry.

Two seed innovations on the horizon may prove as disruptive to the lawn service industry as hydraulics was to machinery. But opportunities exist for companies to hold their own when these new technologies come knocking rather than being left out as the marketplace evolves.

Roundup-resistant grass seed

Over the past decade, Scotts Miracle-Gro has transformed itself from a company selling commodities such as seed and fertilizer into one of the top U.S. players in residential and commercial lawn care. Now, after 17 years in the lab, Scotts is preparing to unleash a disruptive innovation: Roundup-resistant turfgrass.

Scotts has gained federal deregulation of Roundup-resistant tall fescue, with similar innovations in Kentucky bluegrass and St.

Augustinegrass close behind, according to a West Coast agricultural newspaper. This means the firm is free to plant and market genetically modified (GM) turf without further federal regulation. GM crops are commonplace in agricultural production fields. But this will mark the first time these varieties have entered the turfgrass seed market.

By some estimates, putting a single GM variety through federal regulatory approval costs north of $20 million. With turfgrasses, it's even more costly. Why? In a cornfield, a single variety of corn grows. In a lawn, four varieties of various species may be in the mix. If a contractor intends to spray Roundup on that mixture, the seed company would have to put all four varieties through federal registration at a cost of $80 million.

How did Scotts get Roundup-resistant turf approved without breaking the bank? The answer to this question requires a little background. Unbeknownst to many, lawmakers have never created a federal agency to approve GM plants. The authority was bootlegged from existing programs based on the fact that some pathogenic organisms and virus genes are used to develop GM plants. Certain federal agencies do indeed have the

Understanding disruptive innovations

Many companies fail while fighting innovations rather than embracing them. Clayton Christensen, Harvard Business School professor, author and leading thinker on innovation, shares a few of his teachings on this topic.

- New disruptive technologies are initially embraced by the *least* profitable businesses, not the most profitable ones.
- Most often, new ideas catch fire in small, insignificant market segments. Rarely do they start with market leaders.
- The usual paradigms of sound business management—work harder and smarter, listen more—are useless when dealing with a disruptive technology.
- Companies that listen to their customers rarely invest in disruptive technologies until it is too late.
- Businesses focused on stealing competitors' customers take their eyes off of their customers' next-generation needs.
- Companies that succeed with a disruptive technology have managers who took the time to find the right customers for the product.

authority to regulate transport of potential pathogens or parts thereof.

In a stroke of near genius, scientists at Scotts created Roundup-resistant grass without using pathogens or viruses to help insert the genes. Therefore, this innovation does not fall under federal jurisdiction, clearing the way for commercial release.

As Christensen asserts, disruptive technologies like this one initially have some warts. Five separate concerns have emerged about Roundup-resistant turfgrass:

1. Resistance isn't bulletproof. When the plant is exporting into its roots, it may become susceptible to damage from Roundup.
2. To achieve slower growth and to make its product government friendly, Scotts had to use old technology. It is uncertain whether this strategy will work or will result in uncompetitive, easily trampled plants that produce little seed.
3. Pollen escape is still a real possibility. Turfgrasses don't creep far vegetatively, but they can take a ride by way of the wind when pollen is shed. Scotts discovered this the hard way when pollen from its experimental Roundup-resistant bentgrass wafted 15 miles to cross with other bentgrasses in the landscape, creating Roundup-resistant "weeds."
4. As with all disruptive products, there is a possibility that customers may not appreciate the value of the product. Do customers really want Roundup-resistant fescue, and are they willing to pay extra for it? Will the seed be inexpensive enough to allow contractors to make a profit? Will GM turf create more problems than it solves?
5. There is the issue of exclusivity. Will Scotts be willing to share this innovation with friendly competitors or will it keep it to itself to capture market share?

All existing vegetation must be killed before converting to a turfgrass like My Holiday Lawn. Any vegetation left behind will, unfortunately, outgrow My Holiday Lawn and cause problems later.

PHOTOS: DOUG BREDE

These grass plugs were extracted from one-year-old turf plots that had not been mowed for one month. The appearance of the turfgrass on right improves as it matures.

Low-mow grasses

My Holiday Lawn is the brand name for a series of grasses I developed over the past 14 years that can be mowed as little as once a month rather than once or twice a week. According to Homewyse, a "vendor-neutral" online reference for consumers and trade professionals, the average homeowner could save $1,000 per year in mowing service costs. Commercial property owners stand to save even more.

The idea for this patent-pending innovation traces back 25 years. Arden Jacklin, who founded Jacklin Seed in 1936, authored an opinion article in which he describes the most common question homeowners' groups ask him: "When will you have for us a lawn grass that doesn't have to be mowed?"

Jacklin's response: "You just think you want a grass that does not require mowing. Reduced mowing may be possible, but no mowing at all is not." He went on to explain that if a grass is not actively growing, it won't be able to heal from normal wear and tear. Some growth is desirable but too much just leads to extra mowing.

I began envisioning the possibilities back in the 1990s, when I stumbled upon some curious miniature plants growing in my breeding nursery. In plant breeding, serendipity is often the mother of invention. In 2002, I assembled a lawn trial containing plots of all the dwarf mutants I could locate at the time. It actually was a small trial of only 40 entries, but it was intended as a proof of concept. The results were something less than desirable. The grasses looked dismal with infrequent mowing. They just weren't pretty.

But I didn't give up. My eureka moment came a couple of years later when I had tractor and plow poised to recycle several large, aging turf trials. What if we turned these trials into source material for infrequent-mow varieties? The technique sounded deceptively simple: Mow the variety trials just a few times a year and see what performs best.

The technique worked amazingly well. In all, 10,000 experimental varieties were tested and rated. A rating of one was undesirable, five was minimally acceptable and nine was get-down-on-your-knees-and-kiss-the-grass beautiful. Believe it or not, out of 10,000 plots, there were a handful that got me down on my knees.

The selected varieties are somewhat shorter than a typical Kentucky bluegrass plant, but they are not miniature or dwarf. Being shorter in stature, these grasses do not produce as much seed as normal lawn grasses, so their seed price is somewhat higher, but not prohibitively expensive considering the savings in mowing costs. For homeowners, these grasses can pay for themselves after the first year or two.

The difference between a normal lawn grass and My Holiday Lawn, however, is more complex than just less top growth. In between mowings, a normal lawn grass grows substantially above the intended mowing height, whereas My Holiday Lawn grows green foliage both above and below the mowing height.

These unique grasses require a different approach to lawn care. The lawn's mowing frequency is dictated by the tallest growing component, not the shortest. Just a few tufts of fescue here or there indicate that it's time to mow when otherwise the low-growing grass wouldn't need it for another two weeks. That's why it's important to start with a clean planting bed.

Besides being susceptible to tall grasses, this turf has other quirks. First, the attractive striping pattern after a monthly cut doesn't last as long. It will dissipate in a couple of weeks, replaced by a soft, uniform appearance. Second, it will need regular mowing during its establishment year. Like any lawn grass, it needs fertilization to complete the stand. After the stand is full, fertilizing and mowing can be reduced. Third, My Holiday Lawn is a series of bluegrasses, and bluegrass is not adaptable everywhere. However, in North America alone, more than 100 million people can grow a bluegrass lawn.

One of the steps Scotts used to get Roundup-resistant fescue past government regulators was to insert genes into the new plant using a gene gun. The U.S. Department of Agriculture ruled that it doesn't have jurisdiction over such methods because they don't involve pathogenic bacteria or viruses in the gene transfer.

Discover your niche

Roundup-resistant turf and My Holiday Lawn are scheduled for full release in 2016. Both products, which are aimed at reducing lawn mowing, could be disruptive innovations. Should contractors embrace them or continue with business as usual? Here are some thoughts on how to proceed:

- Rather than viewing these innovations as threats to the lawn service industry, look for ways to use them to advance.
- These novel lawn grasses require novel care. Become a specialist in applying Roundup to the grass and not the flowers or solve the problem of unwanted grass emerging in My Holiday Lawn.
- Become an expert at renovating lawns using these new technologies. This requires specialized expertise that is hard to copycat.
- Consider the advantages of being an early adopter. Early adopters would be first in line for second-generation products.

Doug Brede, Ph.D., has been research director for Jacklin Seed by Simplot for nearly 30 years. In that time, he and his staff have developed more than 100 popular turf varieties used around the world. He is the author of the book "Turfgrass Maintenance Reduction Handbook" and more than 400 articles on turf maintenance.

World | Fri Feb 5, 2016 2:26pm EST

Related: U.S., ENVIRONMENT, REGULATORY NEWS, BREAKINGVIEWS

Bayer rejects EPA request to pull insecticide from U.S. market

CHICAGO | BY KARL PLUME

The logo of German drugmaker Bayer is seen in Leverkusen April 26, 2014.
REUTERS/INA FASSBENDER

The agricultural unit of German chemicals company Bayer AG said on Friday it will fight a U.S. Environmental Protection Agency (EPA) request to pull one of its insecticides from the marketplace amid concerns that it could harm organisms in streams and ponds.

Bayer CropScience will instead ask for an administrative law hearing from the EPA's Office of General Counsel to review the registration of flubendiamide, the active ingredient in Bayer's Belt pesticide.

The registration, granted in 2008, was a limited-time conditional registration that could be canceled if additional studies found the chemical to be damaging, the EPA said in a statement.

"EPA concluded that continued use of the product will result in unreasonable adverse effects on the environment," the agency said.

Flubendiamide products are used to control yield-damaging moths and worms in more than 200 crops including almonds, oranges and soybeans.

Bayer's own tests have found that the pesticide is toxic in high doses to invertebrates in river and pond sediment. The organisms can be an important food source for fish.

However, the company's field studies showed that doses in waters near agricultural fields never reached high enough levels to be toxic.

But the EPA's risk assessment disagreed so the agency sent Bayer the request on Jan. 29.

"We are disappointed the EPA places so much trust on computer modeling and predictive capabilities when real-world monitoring shows no evidence of concern after seven years of safe use," said Peter Coody, Bayer vice president of environmental safety.

The EPA said after Bayer's refusal that it will issue a formal request to cancel the pesticide's registration. After a comment period mandated by U.S. pesticide regulation law, Bayer will ask for a formal hearing to determine the pesticide's fate.

Belt will remain on the market throughout the process.

Bayer reported 471 million euros ($527.5 million) in insecticide sales globally in its most recent quarter. The company declined to provide sales details of Belt.

The EPA's move follows the agency's unsuccessful attempt to withdraw its registration for Dow Chemical Co's Enlist Duo weed killer.

(Editing by Matthew Lewis and Meredith Mazzilli)

Monday, February 8, 2016 | 11:21 am

State orders halt to sale of pesticide used on cannabis plants

Taken off shelves; growers asked to stop using Guardian

From KTVZ.COM news sources

POSTED: 12:54 AM PST February 6, 2016
UPDATED: 1:23 AM PST February 6, 2016

SALEM, Ore. - The Oregon Department of Agriculture said Friday it has ordered a halt of sale and the removal of the pesticide product Guardian, which is labeled for use on ornamental, food, and feed crops for mite control but also used by cannabis growers.

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In addition, ODA is asking growers who may have purchased the pesticide product to refrain from using it. ODA's actions come following an investigation of the product that found the presence of the pesticide active ingredient abamectin, which is not listed on the product label.

A statewide Stop Sale, Use, or Removal Order (SSURO) has been issued by ODA to the manufacturer of Guardian, All In Enterprises, Inc. of Machesney Park, Illinois. The order calls for the company to immediately cease all sales, offers of sale, or other distribution of the product in Oregon.

The product label identifies the active ingredients as cinnamon oil and citric acid, and claims the product is 100 percent natural.

ODA said it's investigation was a result of concerns of product adulteration brought to the agency by a private laboratory as well as representatives of the cannabis industry. ODA's Pesticides Program obtained and sampled Guardian from several retail locations in Oregon. Laboratory analysis found the presence of abamectin.

ODA said it is working with the Oregon Health Authority and Oregon Liquor Control Commission to determine potential human health concerns associated with the use of cannabis products treated with Guardian.

"Growers are advised, in an abundance of caution, not to use Guardian until a review and assessment of human health concerns are completed," the announcement said. "Retailers and the general public in possession of the product are advised not to sell, offer for sale, or distribute Guardian. ODA is working with the manufacturer to determine the appropriate disposition of product that is currently in commerce or with growers."

ODA also said it will be proceeding to address violations of Oregon's Pesticide Law, which include adulteration of a pesticide product, misbranding of a pesticide product, and making false or misleading claims about a pesticide product.

Meanwhile, the agency said it continues to maintain a list of pesticide products to help guide marijuana growers and pesticide applicators throughout the state. The guide list is available on ODA's cannabis

and pesticides webpage at <http://go.usa.gov/cURJH>.

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NIOSH

New Study First to Describe Scope of Illness Associated with the Use of Two Common Herbicides

NIOSH Update: **February 3, 2016**

Contact: Stephanie Stevens (202) 245-0641

A majority of herbicide-related deaths are caused by just two of the more commonly used weed killers—paraquat and diquat—and despite its toxicity, most cases of illness related to paraquat poisoning were low to moderately severe according to new research published in the journal, Environmental Research by the National Institute for Occupational Safety and Health (NIOSH).

To identify the magnitude of illness attributed to the use of paraquat and diquat in the U.S., as well as the causes of illness, researchers examined combined data from three sources from 1998 to 2011: the NIOSH Sentinel Event Notification System for Occupational Risks (SENSOR)-Pesticides Program; the California Department of Pesticide Regulation Pesticide Illness Surveillance Program; and the U.S. Environmental Protection Agency, Office of Pesticide Programs' Incident Data System. Additionally, researchers assessed data from a national database, the National Poison Data System, for national trends of paraquat- and diquat-related illnesses.

"This is really the first time we've looked at the extent of illness caused by these herbicides," said NIOSH Director John Howard, MD. "We now know that all of the cases of illness and death related to these products are preventable, which will help us identify ways to better protect both the workers who need to use these products as part of their job and others exposed to these potentially harmful chemicals."

The study found 300 paraquat- and 144 diquat-related acute illnesses were reported in 35 states and 1 U.S. territory; 76 percent of paraquat-related cases were work-related. While the majority of cases of paraquat-related illness were low to moderately severe—health effects commonly included skin, eye, or neurological symptoms—researchers identified several deaths. Compared to other pesticides, paraquat or diquat was responsible for the majority, 85 percent, of herbicide-related deaths in the U.S.

Of the cases reported, 43 individuals ingested paraquat and 25 ingested diquat. The majority of ingestion cases were unintentional and frequently occurred because the pesticides were improperly stored (e.g. in beverage bottles).

Failure to wear Personal Protective Equipment (PPE), especially eye protection, was the most common

reason people were sickened by paraquat; other causes included drift from the pesticide application site and accidental spills or splashes. For diquat, the most common cause of illness stemmed from application equipment failure followed by accidental spills or splashes.

“When less harmful weed control options aren’t an option, these findings suggest that additional training and stricter compliance with label instructions to ensure proper herbicide storage and PPE use are important measures to help prevent illness or even death,” said NIOSH Medical Officer and senior study author Geoff Calvert, MD, MPH.

For access to a copy of the study please visit: http://dx.doi.org/10.1016/j.envres.2016.01.003 (http://dx.doi.org/10.1016/j.envres.2016.01.003). For more information about the Sentinel Event Notification System for Occupational Risk (SENSOR) visit www.cdc.gov/niosh/topics/pesticides/overview.html (http://www.cdc.gov/niosh/topics/pesticides/overview.html).

NIOSH is the federal agency that conducts research and makes recommendations for preventing work-related injuries, illnesses, and deaths. For more information about NIOSH visit www.cdc.gov/niosh/ (http://www.cdc.gov/niosh/).

Page last reviewed: February 3, 2016
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Content source: National Institute for Occupational Safety and Health (http://www.cdc.gov/NIOSH/) Education and Information Division

Full study link http://www.sciencedirect.com/science/article/pii/S0013935116300032

INSIGHTS

No larger than a pinhead in size, a female *V. destructor* uses a worker bee as transport and food source.

PERSPECTIVES

ECOLOGY

The mite that jumped, the bee that traveled, the disease that followed

Global expansion and trade contributed to the declining health of honeybees

By **Ethel M. Villalobos**

European honeybees are among the best-studied and most widely recognized insect species in the world. Originally kept for honey production, they have become the flagship species for pollination and large-scale agriculture. Since large colony losses were reported across the United States in 2006, researchers have investigated the myriad factors that contribute to the decline in honeybee populations. In particular, the aptly named *Varroa destructor* mite (see the photo) and the deformed wing virus (DWV) have been clearly linked to colony collapse (*1*). On page 594 of this issue, Wilfert *et al.* use a phylogeographic analysis to examine the evolutionary origin and mechanisms for the global spread of the DWV (*2*).

Based on molecular data from 17 countries and 32 geographical regions, the authors confirm that DWV is an endemic

PHOTO: MATT BERTONE

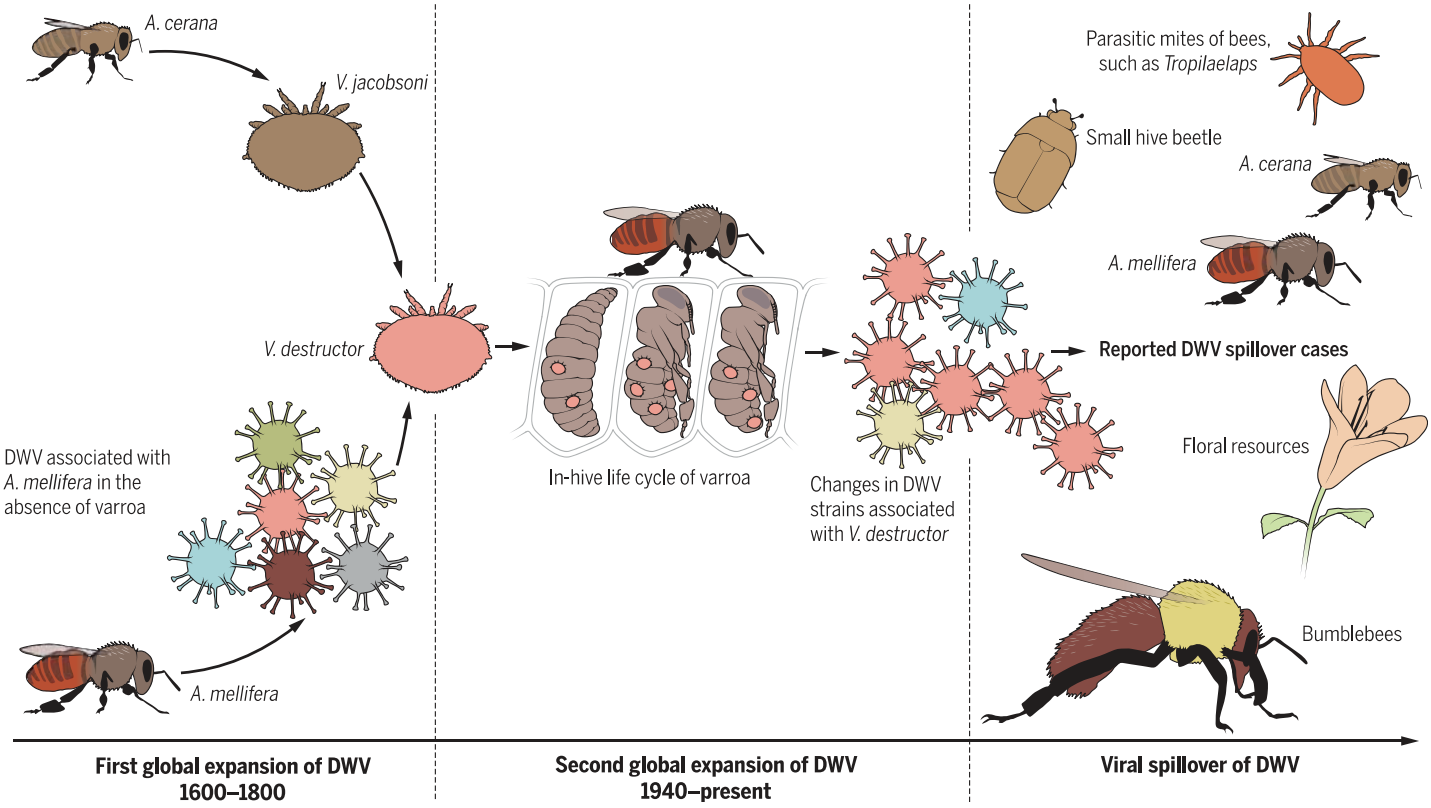
pathogen of the European honeybee, *Apis mellifera* (see the figure). Thus, the recent honeybee decline associated with DWV constitutes the reemergence of a previously existing disease of *A. mellifera*. This reemergence was facilitated by the spread of the new vector *V. destructor* and by human transport of honeybee colonies from Europe and North America to other geographical regions.

The DWV epidemic is part of a global trend of disease reemergence affecting a diverse range of organisms. In the past 20 years, an increase in viral diseases of vegetable crops has greatly affected productivity worldwide. This change was driven by the spread of an insect vector, the whitefly, *Bemisia tabaci*, and the human transport of infected plants (*3*). In the case of the European honeybee and *V. destructor*, natural genetic variation in the brood parasite *Varroa jacobsoni* facilitated its jump from the Asian honeybee (*Apis cerana)* to the European honeybee (*A. mellifera*). Two haplotypes derived from *V. jacobsoni* have adapted to reproduction on *A. mellifera*; both of these haplotypes are now grouped under *V. destructor* (*4*). This novel vector-host relationship was mediated by human introduction of European honeybees to central and southeastern Asia, bringing these two closely related bee species (*5*) into contact.

Martin *et al.* (*1*) have shown that the arrival of *V. destructor* on previously varroa-free islands in Hawaii led to a rapid reduction in DWV strain diversity, coupled with a dramatic increase in virulence. Wilfert *et al.* (*2*) now track the historical global movements of DWV and show that in the recent past, the virus has spread to multiple hosts. Cross-species infections and viral reemergence are more likely to occur if the virus is a "generalist" that can recognize a range of cell receptors and invade a diversity of tissues and hosts (*6*, *7*). According to Wilfert *et al.* (*2*), three viral fragments of the DWV (*rdrp*, *vp3*, and *lp*) show little host specificity, a trait that would favor global expansion. The data provide solid evidence for transmission of DWV from the ancestral host, *A. mellifera*, to *V. destructor,* as well as to novel hosts, such as *Tropilaelaps clarea* (another Asian honeybee mite) and bumblebees.

As with the viral-whitefly association (*3*), the role of humans in the global spread of the European honeybee, the varroa mite, and DWV is undeniable. The first expansion of the honeybee's range began in the early 1600s and continued until the late 1800s. Honeybee colonies were transported on slow-moving cargo ships, packed in iceboxes to simulate winter months and slow their metabolism (*8*). The second large wave of expansion occurred in the past 75 years, promoted by the development of large-scale modern agriculture (see the figure). Wilfert *et al.* use 20th-century samples to reconstruct the origin and migration rates of the DWV during this second wave and correlate the virus expansion with global patterns of mite distribution. Europe and North America are clearly the main centers for transmission of DWV to other areas of the world. Varroa-free areas, such as Australia and some islands in Hawaii, show weaker migration rates of DWV due to geographical isolation, reduced trade, and restrictions on the import of live honeybees to these regions.

Knowledge of the history and ecology of new diseases provides a framework in which to understand the origins, effect, and possible strategies for pathogen control.



Global spread. As shown by Wilfert *et al*., factors driving the global reemergence of DWV, an endemic pathogen of the European honeybee, include human-mediated movement of managed bees, adaptation of a vector mite to a novel host, and changes in the viral population. The first global movement involved managed bees without the vectoring mite. The second, more recent, event occurred after the varroa mite had come into contact with DWV. The increased viral levels and pathogenicity of DWV in the presence of *V. destructor* appear to be linked to a viral spillover to floral resources and a number of arthropod species, including native solitary and social bees.

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ILLUSTRATION: P. HUEY/*SCIENCE*

Wilfred *et al.* provide such a tool by combining molecular data, geography, and a time line for the global dispersion of DWV and *V. destructor*. The high levels of DWV due to mite-related transmission (*9*) affect not only honeybees, but also possibly other insects that may come into contact with the virus (*10*) and food resources they share (*10*, *11*). DWV has been detected in various insect groups that play dramatically different ecological roles, including insect predators and scavengers, pollinators, and pest species that live inside the colony (*10*).

The increased prevalence of DWV in infected colonies, combined with the high density of colonies in certain regions, creates a favorable environment for the virus to spread. The global snapshot provided by Wilfert *et al.* suggests that certain geographic areas have unique ecological conditions that may shed light on the evolution of the DWV and the host-vector relationship. South America, for example, hosts a hybrid of the European and the African honeybee, *Apis scutellata*, which shows genetic differences in immune responses and a greater tendency to remove brood infected by varroa from the hive (*5*). The overlapping ranges of *A. mellifera* and *A. cerana* in Southeast Asia provide an opportunity to compare noncoding RNAs that may be related to antiviral activity (*12*).

Finally, three master variants of DWV—type A, type B, and the newly discovered master variant type C—may produce recombinants, compete with each other within the host colony, and differ in virulence levels (*7*). The few remaining varroa-free refugia provide a unique opportunity to study the numerous master strains that exist without the vector's input. In-depth studies of virus, vector, and host populations in diverse geographical regions will help to understand how viruses spread to new hosts and adapt to new environments. ■

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10.1126/science.aaf0938

The mite that jumped, the bee that traveled, the disease that followed

Ethel M. Villalobos

Science **351**, 554 (2016);
DOI: 10.1126/science.aaf0938

From: cleanearth@tds.net [mailto:cleanearth@tds.net]
Sent: Friday, January 08, 2016 10:30 AM
To: Jennings, Henry
Subject: neonics found to kill bees

Henry – Do you put information I send into Board members' packets? I've seen no action on neonicotinoids.....

Here's yet another reason for the Board to ban neonicotinoids in Maine – the Environmental Protection Agency has finally found that neonics kill bees.....after much of the civilized world has done so for years.

http://www.motherjones.com/tom-philpott/2016/01/epa-finds-major-pesticide-toxic-bees – please print out this article and put into Board members' folders.

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The EPA Finally Admitted That the World's Most Popular Pesticide Kills Bees—20 Years Too Late

—By ***Tom Philpott*** *(/authors/tom-philpott)* | Thu Jan. 7, 2016 2:08 PM EST

Armando Frazao (http://www.shutterstock.com/pic-94126963/stock-photo-a-dead-honey-bee-showing-many-details-of-body-legs-and-mouth-parts-apis-mellifera.html?src=LmKqi8V1VCv2S_dCMh_s7A-1-1)/Shutterstock

Bees are dying in record numbers—and now the government admits that an extremely common pesticide is at least partially to blame.

For more than a decade (https://grist.files.wordpress.com/2010/12/clothianidin-condl-reg-timeline.pdf), the Environmental Protection Agency has been under pressure from environmentalists and beekeepers to reconsider its approval of a class of insecticides called neonicotinoids, based on a mounting body of research (http://www.npr.org/sections/thesalt/2015/04/22/401536105/buzz-over-bee-health-new-pesticide-studies-rev-up-controversy) suggesting they harm bees and other pollinators at tiny doses. In a report (https://www.motherjones.com/files/epa-hq-opp-2008-0844-0140.pdf) released Wednesday, the EPA basically conceded the case.

Marketed by European chemical giants Syngenta and Bayer, neonics are the most widely used insecticides (http://www.tfsp.info/systemic-pesticides/) both in the United States and globally. In 2009, the agency commenced a long, slow process of reassessing them—not as a class, but rather one by one (there are five altogether (http://www.epa.gov/pollinator-protection/schedule-review-neonicotinoid-pesticides)). Meanwhile, tens of millions of acres of farmland

> The report card was so dire that the EPA "could potentially take action" to "restrict or limit the use" of

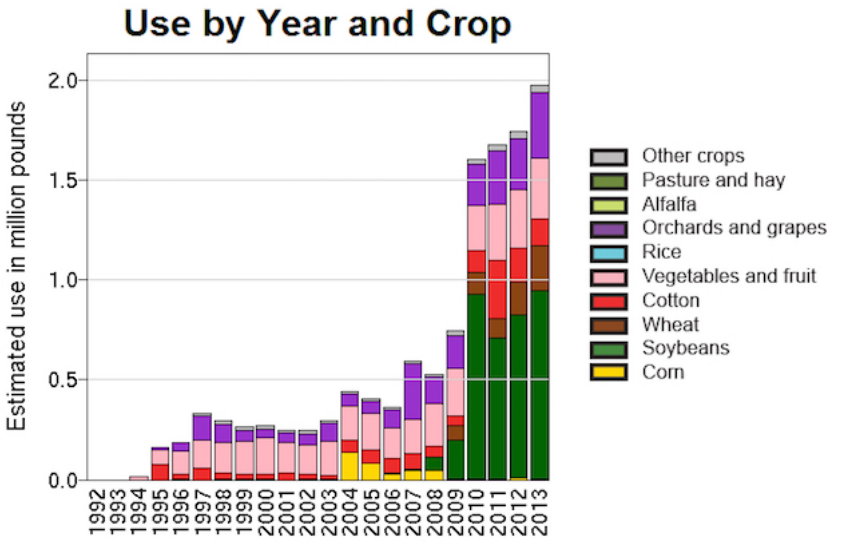
are treated with neonics each year, and the health of US honeybee hives continues to be dismal.

the chemical by the end of this year.

The EPA's long-awaited assessment focused on how one of the most prominent neonics—Bayer's imidacloprid—affects bees. The report card was so dire that the EPA "could potentially take action" to "restrict or limit the use" of the chemical by the end of this year, an agency spokesperson wrote in an emailed statement.

Reviewing dozens of studies from independent and industry-funded researchers, the EPA's risk-assessment team established that when bees encounter imidacloprid at levels above 25 parts per billion—a common level for neonics in farm fields—they suffer harm. "These effects include decreases in pollinators as well as less honey produced," the EPA's press release (http://yosemite.epa.gov/opa/admpress.nsf/eeffe922a687433c85257359003f5340/63e7fb0e47b1aa3685257f320050a7e3!OpenDocument) states.

The crops most likely to expose honeybees to harmful levels of imidacloprid are cotton and citrus, while "corn and leafy vegetables either do not produce nectar or have residues below the EPA identified level." Note in the below USGS chart (https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2013&map=IMIDACLOPRID&hilo=L&disp=Imidacloprid) that a substantial amount of imidacloprid goes into the US cotton crop.



Imidacloprid use has surged in recent years. Uh-oh. *US Geological Survey (https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2013&map=IMIDACLOPRID&hilo=L&disp=Imidacloprid)*

Meanwhile, the fact that the EPA says imidacloprid-treated corn likely doesn't harm bees sounds comforting, but as the same USGS chart (https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2013&map=IMIDACLOPRID&hilo=L&disp=Imidacloprid) shows, corn gets little or no imidacloprid. (It gets huge amounts of another neonic (https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2013&map=CLOTHIANIDIN&hilo=L&disp=Clothianidin), clothianidin, whose EPA risk assessment hasn't been released yet (http://www.epa.gov/pollinator-protection/schedule-review-

neonicotinoid-pesticides).)

> Soybeans could expose bees to dangerous levels of imidacloprid, but data on how much of the pesticide shows up in soybeans' pollen and nectar are "unavailable."

The biggest imidacloprid-treated crop of all is soybeans, and soy remains an information black hole. The EPA assessment notes that soybeans are "attractive to bees via pollen and nectar," meaning they could expose bees to dangerous levels of imidacloprid, but data on how much of the pesticide shows up in soybeans' pollen and nectar are "unavailable," both from Bayer and from independent researchers. Oops. Mind you, imidacloprid has been registered for use by the EPA since the 1990s.

The agency still has to consider public comments on the bee assessment it just released, and it also has to complete a risk assessment of imidacloprid's effect on other species. In addition to their impact on bees, neonic pesticides may also harm birds (http://www.motherjones.com/tom-philpott/2013/03/not-just-bees-bayers-pesticide-may-harm-birds-too), butterflies (http://www.mprnews.org/story/2015/02/10/butterfly-deaths-neonicotinoids), and water-borne invertebrates (http://www.ncbi.nlm.nih.gov/pubmed/25454246), recent studies suggest. Then there are the assessments of the other four neonic products that need to be done. Meanwhile, a coalition of beekeepers and environmental groups filed a lawsuit (http://www.centerforfoodsafety.org/files/2016-1-6-dkt-1--pls--complaint_11142.pdf) in federal court Wednesday pointing out that the agency has never properly assessed neonics in their most widely used form: as seed coatings, which are then taken up by crops.

As If Slavery Weren't Enough, 6 Other Reasons to Avoid Shrimp (/tom-philpott/2016/01/six-reasons-think-hard-about-shrimp-craving)

The Oregon Militia Is Picking the Wrong Beef With the Feds (/tom-philpott/2016/01/malheur-militants-are-picking-wrong-beef-feds)

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