



# Chemically Speaking

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## New Company to Harness Spider Venom

In March, the Vestaron Corporation announced that the Environmental Protection Agency (EPA) approved the active ingredient in the company's breakthrough bioinsecticide for commercial sale. The insecticide, a naturally occurring peptide isolated from spiders, is approved for use on a wide variety of crops and has shown no toxicity to fish, birds or mammals, including humans. "This is a game-changer for agriculture," said Dr. John Sorenson, Chief Executive Officer of Vestaron. "Our bioinsecticide is safe for humans, safe for non-target animals and plants, and better for the environment. EPA registration marks a key milestone in bringing Vestaron's technology to the market, following the successful scaling of production and the development of an effective oral formulation. The insecticide will be in pre-

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commercial demonstration trials in 2014, with a full commercial launch in early 2015,” Sorenson said.

“For years, scientists have argued that the most effective way to manage the development of resistance in insect pests is to combine separate active ingredients into a single insecticide,” said Dr. Robert Kennedy, Chief Scientific Officer of Vestaron. “Our peptide uniquely provides novel and complex modes of action in one molecule - a real breakthrough.”

“This biopesticide is one of a vast number of similar compounds that exist in nature, from which we intend to source many new, unique insect control products,” said Sorenson. “In addition, Vestaron is incorporating the gene for this peptide into a new generation of insect-resistant plants. We're also synthesizing compounds that mimic the peptide's action. Founded in 2005, Vestaron is a venture-funded start-up based in Kalamazoo, Mich. (*Agprofessional*, 2/6/14).

## Export Confusion Continues

Syngenta, under pressure from U.S. grain exporters to suspend sales of seeds containing a new genetically modified corn trait that is not approved in China, said in early February that it has already "sold out" of the product (Duracade®). By announcing that all seeds containing the trait had been sold, Syngenta shifted the focus of a farm-sector controversy back to grain merchants, who must decide whether they will buy grain produced from the seed by farmers.

The National Grain and Feed Association and North American Export Grain Association asked Syngenta in January to suspend the commercial use of the traits following the rejection of multiple cargoes of U.S. corn by Chinese authorities since November. The rejected cargoes contained the Viptera® trait, known as MIR 162. The planting of Duracade® this spring threatens new disruptions as well as millions of dollars in potential losses for global grain traders, if the strain gets mixed into the mainstream supply chain and prompts another round of rejections from China.

Syngenta has declined to suspend sales of MIR 162 event seed. Previously the company had stated that Duracade® would be available for planting for the first time this year in the U.S. in "limited quantities" after U.S. authorities cleared it for sale and cultivation last year. Syngenta applied for Chinese import approval of the trait in March 2013 after U.S. authorities cleared it in February. In theory, China's agriculture ministry has 270 days to make a decision. However, industry sources say it can take as long as two years after a strain is approved by the United States. Syngenta also is waiting for the European Union to approve Duracade® for import. The company won import approval from Mexico and South Korea in September and from Japan in August. It also has import approval from Australia, New Zealand and Taiwan. Viptera® received U.S. approval in 2010 and has been awaiting approval from China for more than two years. The European Union approved Viptera® for import in 2012. “It doesn't actually achieve anything to suspend Viptera® sales given that we've got a history now of many years of sales in the U.S., and of course a number of years of successful shipments to China,” a Syngenta spokesman said.

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Grain traders such as Cargill and Bunge stated in mid-February that it will reject Duracade® crops delivered to its grain elevators for export contracts. “Cargill reserves the right to reject and/or require testing of deliveries and any acceptance, rejection or testing for the presence of Duracade® will be determined by Cargill in its sole discretion at the time of delivery,” the company said.

Since November, China's authorities have rejected more than 600,000 tons of U.S. corn and corn products containing another unauthorized genetically modified Syngenta corn trait, Agrisure Viptera®. China has also begun testing imported U.S. soybean cargoes at the southern province of Guangdong for contamination with the MIR 162 strain of corn. “At our grain elevators, we will continue to ask farmer customers to give us advance notice if they will deliver Viptera®,” Cargill said. “This coming crop year, we are asking the same for Duracade®. (*Reuters*, 2/5/14 & *AgriMarketing*, 2/17/14).

## Promising Late-blight Resistant Potato

A three-year UK trial has shown that unprotected potatoes can thrive despite being exposed to late blight. Potatoes are particularly vulnerable to late blight, caused by a fungus-like organism that loves the damp and humid conditions that often occur during the growing season in Europe. The speed with which this infection takes hold and the devastating impacts on the crop make it the number one threat to six million tons of potatoes produced in the UK each year. Farmers have to be continuously on their guard and need to spray up to 15 times a season to protect against the disease.

Scientists at the John Innes Centre and the Sainsbury Laboratory began a trial with blight-resistant potatoes in 2010. The researchers added a gene to ‘Desiree’ potatoes, from a wild South American relative, that helps the plant turn on its natural defenses to fight off blight. The scientists involved say that the use of techniques to add extra genes was crucial in developing a plant resistant to the blight. “Breeding from wild relatives is laborious and slow, and by the time a gene is successfully introduced into a cultivated variety the late blight pathogen may already have evolved the ability to overcome it,” said Prof Jonathan Jones, of the Sainsbury Laboratory, the lead author of the study.

In 2012, the third year of the trial, all the non-GM potatoes became infected with late blight by August while the modified vegetables remained fully resistant to the end of the experiment. There was also a difference in yield, with the GM variety producing double the amount of tubers. The scientists say that since the potatoes are grown from tubers rather than seeds, they are sterile and the issue of GM pollen escaping into the wild does not arise. One area the scientists cannot comment on is the taste, as they were barred from eating the GM variety. However, they do not believe there is any mechanism by which the new genes can impact the flavor.

The scientists believe the big challenge will be in getting regulatory approval for the new variety in Europe. The researchers have licensed the technology to an American company, Simplot, which wants to grow them in the US. “I think it is unfortunate that American farmers are going to benefit from the fruits of European taxpayers' funded work way before Europeans,” said Prof Jones. “This kind of product will likely be on the U.S. market within a couple of years and if we are

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lucky within eight to 10 years in Europe.” (*BBC News*, 2/16/14).

## EPA Proposes Changes to WPS

The Florida Department of Agriculture and Consumer Services (FDACS) will be hosting a meeting with growers and grower organizations to provide an overview of the recently proposed changes to U.S. Environmental Protection Agency’s (EPA) Worker Protection Standard (WPS). The purpose of the meeting is to better inform the grower community on the WPS proposals and the comment submission process. Mr. Richard Pont with the U.S. EPA, Office of Pesticide Programs will be making a presentation and answering questions regarding the changes. The meeting will be held on April 3, 2014 at 9:30 AM-12:00 PM at the Citrus Research and Education Center (CREC), located at 700 Experiment Station Rd., Lake Alfred, FL. Please note that the public is strongly encouraged to submit their comments to the docket via [Regulations.gov](http://www.epa.gov). For more information about EPA’s WPS proposals go to: <http://www.epa.gov/oppfead1/safety/workers/proposed/index.html>.

Proposed changes include:

- Increased frequency of mandatory trainings (from once every five years to annually).
- Expanded mandatory posting of no-entry signs for the most hazardous pesticides.
- First time-ever minimum age requirement: Children under 16 will be prohibited from handling pesticides, with an exemption for family farms.
- No-entry buffer areas surrounding pesticide-treated fields for protecting workers and others.
- Measures to improve the ability to enforce compliance.
- Respirator use must be consistent with the

OSHA standards.

- Make available to farm workers or their advocates (including medical personnel) information specific to the pesticide application, including the pesticide label and Safety Data Sheets.

## Plant Produces Own Pheromone Protection

Kansas State University and Swedish researchers recently reported about using plants to produce insect-confusing pheromones to repel pests. Insect pests currently managed with synthetic pheromones are prevented from breeding. While these pheromones can be made chemically, it can be a toxic process to produce them, so the team devised a manner in which the plant produces them itself.

The study focused on the bird-cherry ermine moth and the orchard ermine moth - two insects that feed on the leaves of orchard trees and, as caterpillars, can strip trees of their bark. The KSU researcher helped the Swedish researchers use enzymes from plants and moths to create a biological pathway that made it possible for plants to produce the moths' sex pheromones. He contributed an enzyme from the burning bush plant that performed the final step in the synthesis process, essentially turning plants into pheromone production factories. Once the correct combination of enzymes was finalized, researchers modified *Nicotiana benthamiana*, an Australian plant that is closely related to tobacco. The result was plants that produced pheromones that mimicked the sex pheromones of both moth species.

The Swedish researchers baited moth traps with the plant-produced pheromone. They found that each trap attracted an average of 130 male moths -

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half the number of catches possible with synthetic pheromones but enough to demonstrate the effectiveness of the biosynthetic method. While still a proof-of-concept experiment, engineering plants to be insect pheromone-producing factories creates an environmentally friendly alternative to pesticides as well as an easier and less expensive method of synthesizing insect pheromones. KSU researcher Timothy Durrett said "none of the enzymes that were put together would interact with each other naturally, so it was really exciting to see this pathway work and be as effective as it is." (*Agprofessional*, 2/26/14).

## **Pesticide Registrations and Actions**

### **Food Related Actions**

- Based on a request by IR-4, tolerances have been granted for residues of the herbicide linuron (Linex®). Tolerances of interest to the region include fresh and dry cilantro, coriander, dill seed/oil, fresh and dry dill, and parsley. (*Federal Register*, 2/12/14).
- Based on requests by BASF Corporation, tolerances have been granted for residues of the fungicide fluxapyroxad (Sercadis®). Tolerances of interest to the region include pecan, strawberry, sugarcane, brassica leafy vegetable (group 5), bulb vegetable (group 3-07), cucurbit vegetable (group 9), leafy vegetable except brassica (group 4), root vegetable except sugar beet (subgroup 1B). (*Federal Register*, 2/26/14).
- Based on a request by IR-4, a tolerance has been granted for residues of the fungicide

triflumizole on tomato. (*Federal Register*, 3/5/14).

- The EPA announced in early March that future methyl bromide critical use exemptions would only be available to California strawberry growers, certain stored products, and dry cured pork products for the 2014 and 2015 control periods. (*Federal Register*, 3/7/14).

### **Other Actions**

- The EPA has reached agreement with Sergeant's Pet Care Products, Inc. and Wellmark International to cancel flea and tick pet collars containing propoxur marketed under the trade names including Bansect, Sentry, Zodiac and Biospot. The decision was reached as a result of EPA's risk assessment showing risks to children from exposure to pet collars containing propoxur. Propoxur is an insecticide registered for use to control ticks, fleas and a variety of insects. The EPA completed the propoxur pet collar risk assessment in fall 2013 in response to a Natural Resources Defense Council petition to cancel the uses. The assessment found, in some but not all use scenarios, unacceptable risks to children from exposure to propoxur pet collars on the first day following application. Flea and tick collars work by leaving a pesticide residue on dogs' and cats' fur, which can be transferred to people by hugging, petting or coming into contact with the pets. The major source of exposure to these chemicals is from absorption through the skin after directly touching the treated pet. Small

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children may ingest pesticide residues when they touch a treated cat or dog and subsequently put their hands in their mouth. Because the manufacturers could not find a way to eliminate unacceptable risk under all scenarios, EPA encouraged them to cancel these products and they subsequently agreed. Under the cancellation agreement, manufacturers are allowed to produce the pet collars until April 1, 2015, and will not be allowed to distribute the products after April 1, 2016. EPA will continue to watch for incidents from the use of these collars and is prepared to take further action if necessary. (EPA Release, 3/14/14).

- A genetically modified corn, Pioneer's TC1507 (Herculex® - with European corn borer resistance as well as glufosinate resistance), won EU approval in controversial fashion in February after a large majority of member states failed to block it. A meeting of European Affairs ministers from the 28-member bloc could not establish a definitive position either way. Accordingly, TC1507 was allowed through and handed over to the European Commission for the next step in authorization. According to Dupont, it will take another two years to get it on the market, bringing the process to 15 years. The European Food Safety Authority (EFSA) had cleared it no less than six times and the Commission must abide by EFSA's findings. EU Health Commissioner Tonio Borg recalled that the EU had recently banned, for example, certain insecticides after EFSA judged they harmed bees. Four other GM crops have won EU approval but only Monsanto's MON810 maize is grown, with two other corn types plus BASF's

Amflora potato abandoned. (*EUbusiness*, 2/11/14).

## Pesticide Potpourri

- A California appeals court tossed a \$2.3 million jury award against Dole Food Company in early March, saying a lower court correctly vacated the award. A three-judge panel wrote that a state court rightly dismissed the suit against Dole and The Dow Chemical Co. on the grounds that the purported 1970s Nicaraguan banana farm workers who sued the company may have built their case on false testimony at the behest of their attorneys. Theodore J. Boutros Jr. of Gibson Dunn & Crutcher LLP, representing Dole, said in a statement that the firm was extremely pleased with the ruling. "As the trial court found, the plaintiffs' lawyers recruited fake plaintiffs in Nicaragua, [and] coached them to lie ... seeking to defraud Dole and the judicial system itself," he said. Filed in Los Angeles Superior Court by a group of Nicaraguans in March 2004, a California jury found that six plaintiffs in the case had never actually been workers on Dole plantations, but it awarded \$2.3 million in damages to another six plaintiffs it found had been workers in 2007. The suit was one of many involving dibromochloropropane, a pesticide commonly known as DBCP that is no longer used in the U.S. and has been found to cause male sterility in some mammals. (*Fresh Plaza*, 3/1/14).
- In response to an industry in search of a new mode of action, Brake F2 (fluridone)

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herbicide has been granted Section 18 emergency exemptions for use in 2014 in approved counties of Georgia, South Carolina, North Carolina and Tennessee for the control of glyphosate-resistant Palmer amaranth. SePRO Corporation and Nichino America, Inc. are partnering in the marketing and product stewardship effort for Brake F2. The launch of a new Brake F2 website (<http://sepro.com/brake>) offers growers and agents access to application instructions, links to expert advice and authorized distributor agents, product label downloads, pricing and more. The USDA turned to SePRO Corporation in 2011 to inquire about the potential use of Sonar® for the control of Palmer amaranth. Almost a decade before Sonar® was introduced to the aquatics market in 1986, it had also been investigated and proven highly effective for weed control in cotton under the trade name Brake®. Recognizing that the alternate mode of action offered by Brake® was integral in the effort to manage glyphosate-resistant Palmer amaranth, the Brake® Cooperative Research Program was initiated by SePRO Corporation with support from Cotton Incorporated and the National Cotton Council. (*AGprofessional*, 3/7/14).



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