

# Sun Journal

## No modified corn

Thursday, November 8, 2007

I was alarmed when I recently learned that Maine has approved the planting of genetically modified corn. This specific corn plant, called Bt corn, is genetically engineered to produce a pesticide in every single cell of the plant.

What troubles me most is that corn pollen can travel for miles on the wind to reproduce. This poses risks to all corn growers, as Bt corn is a variety of corn owned and patented by Monsanto, one of the world's most powerful agriculture corporations.

So far, 90 American farmers across the country have been sued by Monsanto after their fields were unknowingly contaminated by blown-in pollen. In all of these lawsuits, because of the way patent law has been applied, farmers are technically liable.

The Center for Food Safety notes in a report that Monsanto sets aside an annual budget of \$10 million and a staff of 75 devoted solely to investigating and prosecuting farmers. I believe Monsanto would like nothing more than to be the only source for staple crop seeds in this country and around the world, and has proven this by aggressively destroying centuries-old farming practices to achieve this goal.

No wonder Monsanto was among those who applied for this approval of Bt corn in Maine.

**Katie Boverman, Greene**

**Editor's Note: A public hearing on genetically modified corn will be held before the Maine Board of Pesticides Control at 9:30 a.m. on Nov. 16, at the Hampton Inn on Kennedy Memorial Drive in Waterville.**

# KENNEBEC JOURNAL

KENNEBEC JOURNAL *Morning Sentinel*

## Corn fight?

### ***Rules regarding genetically-modified corn still up in air***

By *MECHELE COOPER*

*Staff Writer*

*November 13, 2007*

AUGUSTA—Genetically modified corn is coming to Maine, and a Maine Board of Pesticides Control public hearing will air proposed rules regulating its use.

Bt corn is genetically enhanced to resist damage by pests and promises to boost production levels. Licensed by the Environmental Protection Agency for use in 1996, Bt corn is engineered to produce a toxin lethal to corn pests, particularly the European corn borer.

But a recent National Academy of Sciences report outlines unanswered ecological concerns from planting the engineered food. And exactly how the corn will be used and planted in Maine is still undetermined while the state considers rules governing its use.

Bt corn—for *Bacillus Thuringiensis*—could be used for the first time in Maine next year. The state Board of Pesticide Control approved the licensing of the product July 27.

Paul Schlein, board spokesperson, acknowledged that the process of placing restrictions on the corn's use is coming after the product already was approved—an approach he called "cautious."

"Most states in the country allow Bt corn with no additional restrictions beyond what the federal government requires or the label itself," Schlein said Monday. "In the case of the (Maine) board, they decided to take a more cautious approach. It is a pesticide and we take a close look at every pesticide in the state."

Proposed regulations include licensing for Bt corn; requiring dealers to keep records of sales; and training for anyone planting Bt corn.

Protect Maine Farmers—a group formed to reduce threats from what it calls "genetic trespass"—is urging people to attend the hearing and ask the board to reconsider its decision.

Logan Perkins of Protect Maine Farmers, which opposes Bt corn's registration, said a study funded by the National Science Foundation shows toxins from Bt corn may travel long distances in streams and harm water insects that serve as food for fish.

These results, she said, compound existing concerns about the ecological impacts of Bt corn raised in previous studies.

One study—in the Oct. 8 edition of *The Proceedings of the National Academy of Sciences*—shows Bt corn-grown toxins harm beneficial insects living in the soil.

Perkins said that study "should be the final nail in the coffin of Bt corn for Maine."

"It clearly demonstrates that there is still a huge amount of research to be done to fully understand how far Bt corn can travel and what effects it has on its surroundings," she said.

Perkins said Bt corn now accounts for approximately 35 percent of corn acreage in the United States and its use is increasing.

Organic farmers worry the use of Bt corn could lead to the evolution of pesticide-resistant insects and a process known as genetic drift—genetically-modified corn crops pollinating and thus contaminating organic ones.

Opponents of the July decision to approve the pesticide corn suggest the National Academy of Sciences study should be grounds for the board to revisit its decision to license the product in the first place.

Jennifer Tank, a member of the team studying Bt corn at the University of Notre Dame, said the exact extent to which aquatic ecosystems will be affected is still unknown and likely will depend on a variety of factors, such as current ecological conditions, agricultural practices and weather patterns.

"Overall, our study points to the potential for unintended and unexpected consequences from the widespread planting of genetically-engineered crops," Tank said.

Schlein said the study will be presented to the board at the meeting for consideration.

"They may decide to establish an environmental risk advisory committee to look at the study," Schlein said. "It's the first of its kind. We take these things very seriously and don't want to just accept (Bt corn use) out of hand without taking a close look. This study is getting a lot of attention right now, and even more so here."

The public hearing is 9:30 a.m. Friday at the Hampton Inn in Waterville. Written comments will be accepted by the board until Nov. 30.

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# KENNEBEC JOURNAL

KENNEBEC JOURNAL *Morning Sentinel*

## New questions on genetically modified corn

11/14/07

What do you get when you mix genetically modified corn and caddisflies? That's not the preamble to a joke.

Last month, researchers funded by the National Science Foundation published a study in the Proceedings of the National Academy of Sciences providing the first documented evidence that toxins from genetically modified corn may get into streams and harm insects that are an essential food for fish.

The corn is known as BT corn, and it is designed to manufacture a toxin that provides protection against agricultural pests -- essentially, the plant that grows from BT corn seed is a pesticide. The seed is manufactured by a number of large biotechnology companies, and up until last summer, growing BT corn was prohibited in Maine.

But a group of dairy farmers in the state who wanted to grow the corn to feed their cows made the case that BT corn can be grown more cheaply than conventional corn and thus offered them competitive advantages -- advantages already enjoyed by farmers in other states where the corn wasn't prohibited.

They pressed their case with the state's Board of Pesticides Control, which was the agency responsible for permitting the corn's planting because it is considered a pesticide. Their case was met with resistance by the state's growing number of organic dairy farmers, who asserted that pollen drifting from the genetically modified corn would contaminate organic corn used for feed, jeopardizing essential organic certification for their operations.

The board made a Solomon's judgment in July and declared it would permit BT corn to be planted in the state -- but only under a set of strict rules to be devised by late this year designed to protect organic farmers.

But while they were working on devising those rules this fall, the study about BT corn and caddisflies was released.

The data in the study is worrisome enough that the board, which was due to discuss the new rules later this week, should reverse course and reconsider its permitting of BT corn use in Maine.

When the board first considered the request for permission to plant BT corn, the major issue of contention was the genetic contamination of organic corn by genetically modified corn. That's because the EPA had previously performed tests to determine the corn's effect on water resources -- and found no significant effects.

But those EPA tests were problematic -- they didn't look at insects more closely related to the ones the BT corn's pesticide targeted. So EPA's researchers potentially missed an entire biological community that could be effected by the corn. That's what the most recent study looked at. Where the EPA looked at the crustacean species known as *Daphnia*, the more recent study looked at caddisflies, one of the most important food sources for fish.

And what it found, according to the National Science Foundation, was that the corn's "plant parts are washing into local streams." BT corn pollen was also "being eaten by caddisflies." In laboratory tests, "consumption of BT corn byproducts increased the mortality and reduced the growth of caddisflies," and thus "the toxin in BT corn pollen and detritus can affect species of insects other than the targeted pest."

Maine's farmers are an important part of our state's economy, social fabric and our landscape. Giving them more of a competitive edge is something we should do -- if possible. But in this case, there's a competing value that's potentially at risk if BT corn is planted and damages our water resources. Maine's rivers and streams, the species that depend on them and the fishing they provide are an equally important part of our economy, social fabric and landscape. The introduction of a technology that benefits one, but threatens another, must be carefully weighed.

At the very least, the Board of Pesticides Control should revoke the BT corn permits until they can be reconsidered in light of further study.

We need to know the degree of toxicity posed by BT corn to caddisflies and other aquatic insects. We need to know how long the toxins persist in streams and how far the toxicity may travel once it gets into a stream. The University of Maine's Mitchell Center for Environmental and Watershed Research has strong staff expertise in stream ecology and would be ideally suited to pursue this work.

In the meantime, BT corn should not be planted in Maine.

## Strict rules needed to protect organic crops

*Melissa Hughes*

11/15/2007

Farmers are constantly struggling to maintain their livelihood while ensuring a supply of nutritious food for residents of Maine and people throughout the nation.

For Maine's organic farmers, the choice to farm organically is being threatened by regulation recommendations soon to be submitted to the state Legislature. Citizen voices can help ensure that solid regulations protect farmers' right to choose how they farm, including farming organically.

On Friday, the Board of Pesticides Control will consider recommendations for rules governing the use of corn that is genetically modified to incorporate *Bacillus thuringiensis* (Bt). Depending on Board of Pesticides Control's recommendations, the livelihood of Maine's organic dairy farmers could be at risk.

Until this past summer, Maine had proudly been the last state to refuse the sale of Bt corn. It's part of a decades-long tradition the state has maintained of support and promotion of organic farming. Maine has been at the forefront of the organic movement, with the Maine Organic Farmers and Gardeners Association setting roots in Maine more than 35 years ago.

Today, Maine is home to nearly 100 organic dairy farmers and a variety of about 140 other organic operations throughout the state.

Bt corn poses a threat to Maine's organic future through the possibility of cross-contamination. Because all corn is wind-pollinated, organic farmers are at risk if the genetically modified Bt corn cross pollinates with any organic variety.

So, if the Bt corn drifts over to an organic farm and pollinates corn on that farmer's soil, the organic farmer's crop is contaminated, his efforts to avoid genetically modified corn are wasted and his choice to farm organically is taken away from him.

Because of Maine's location at the far northeastern corner of the United States, organic farmers struggle to produce or purchase certified organic feed for their animals. It's hard to produce here and expensive to import from other states.

Contamination of Maine's organic feed crops with transgenic varieties will have a devastating economic effect on Maine's organic dairy industry, which relies on home-grown feed. Legislation needs to be in place to protect Maine's organic producers from contamination.

Organic farms have the right to be legally and physically protected from the threat of cross-contamination, and organic farmers are hoping for a reasonable compromise: A buffer zone of 660 feet, provided by the Bt corn grower, should be in place between all transgenic and organic crops and should be the minimum buffer zone allowed. That 660 feet is the recommended isolation distance required by the U.S. Department of Agriculture for keeping seed varieties pure and thus allows organic farmers to save their own seeds.

The responsibility to protect against contamination needs to be placed on the farmers choosing to plant the Bt corn -- not on the organic grower.

Maine citizens, including Maine's organic dairy farmers, have the right to know where Bt corn is being grown near their property. While the draft rules require seed dealers and farmers to keep records of where, and how much, Bt corn is being planted in Maine, the rules also provide that this information will be kept confidential, ostensibly to "protect" the identity of farms using Bt corn.

That information should be reported to the government and open for public access. Existing laws entitle any neighbor owning a "sensitive area" within 500 feet of a farm to request notification of pesticide use on that farm. The burden of notification should lie with the transgenic user.

In order to maintain the integrity of Maine's organic dairy industry, the market and consumers expect -- and organic farmers want to provide -- organic farms that operate without the presence of genetically modified organisms and pesticides.

The Board of Pesticides Control should protect Maine's organic farmers by setting strong guidelines to prevent cross-contamination and should state that the responsibility of contamination lies with the transgenic grower.

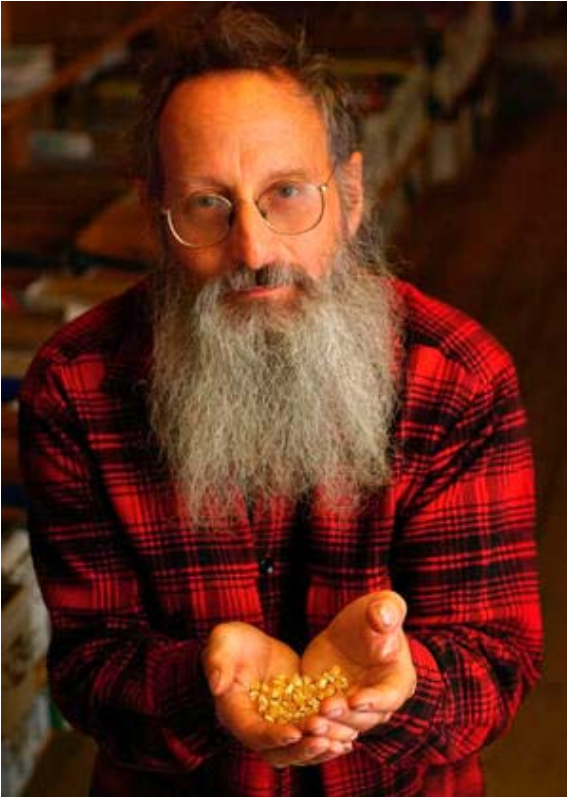
*Melissa Hughes is general counsel for Organic Valley Family of Farms, America's largest cooperative of organic farmers. Organic Valley produces more than 200 organic foods that are sold in supermarkets, natural foods stores and food cooperatives. For more information, visit [www.organicvalley.coop](http://www.organicvalley.coop), [www.organicprairie.com](http://www.organicprairie.com) or [www.farmers.coop](http://www.farmers.coop).*

# Morning Sentinel

KENNEBEC JOURNAL Morning Sentinel

## Genetically modified seeds raise contamination fears

By ALAN CROWELL  
Staff Writer  
11/16/2007



Staff photo by Jeff Pouland

**CONTAMINATED CORN:** C.R. Lawn, founder of Fedco Seeds, holds a variety of sweet corn seed in the company's warehouse in Clinton that showed a trace amount contamination when tested for genetically modified organism.

WATERVILLE -- C. R. Lawn plans to testify today before the Maine Board of Pesticides Control on the need to protect against the spread of pollen from genetically engineered corn.

Founder of FEDCO Seeds, a gardening supply cooperative that pledges not to sell genetically engineered seeds, Lawn has firsthand experience with the problem.

For seven years, FEDCO has tested random samples of corn seed to ensure it is not contaminated by genetically engineered plants. For the first time this year, three samples from the same supplier tested positive -- evidence that pollen from genetically altered corn contaminated the supplier's crop.

"The problem with pollen is you can't fence it in," said Lawn, who would like to see the state adopt a 660-foot buffer around Bt (*Bacillus thuringiensis*) corn, a type of corn that is genetically altered to produce its own pesticides.

For about a decade, Maine was the only state in the country where the use of Bt corn was not allowed. That changed in July, when the Maine Board of Pesticides Control licensed the use of Bt corn.

Farmers argued that new Bt lines offered growers competitive advantages.

According to the National Science Foundation, Bt corn accounts for about 35 percent of the corn acreage in the United States and is gaining in popularity.

What remains to be determined before crops are planted next spring, however, are the rules under which farmers can use it.

Among the rules under consideration are requiring growers to keep records of their use of the seeds and receive special training.

At today's hearing, the public is invited to weigh in on those regulations.

Lawn said he favors a buffer because corn in one farmer's field has the potential to pollinate corn in another farmer's field, potentially spreading unwanted genes.

Of the three seed samples that tested positive this year for the presence of genetically engineered material, two showed a trace amount of contamination and one came back positive, meaning it showed more than a trace amount.

The test used was very, very sensitive, said Lawn, but the results were still cause for concern.

"My feeling is that the seed industry is going to have to be adamant about protecting their (seed varieties)," said Lawn

All three lots that tested positive were taken off the market, he said. Two of those varieties will not be included in this year's catalogue. He said the other variety will be tested before orders are shipped.

"Corn pollen is scattered by the wind. If you are selling contaminated seeds ... there is the risk that it could spread to other people's corn who don't want it," said Lawn.

Some studies have found that the pesticides produced by the plants, not only protect them against crop-damaging insects but may also have negative impacts on aquatic insects that serve as food for fish.

Logan Perkins, campaign organizer for Protect Maine Farmers, said there are simply too many questions that haven't been answered about the short-term and long-term effects of the Bt plants.

"Bt corn has only been on the market for ten years and in the world of agriculture that is only the blink of an eye," she said.

Perkins said that her organization advocates the use of a mile-wide buffer around Bt corn crops.

John Jemison, an extension professor of water quality and soil science at the University of Maine Cooperative Extension and member of the pesticide board, said several of the state's large dairy farmers argued in favor of using the Bt lines.

Jemison said his own research has not shown significant yield benefits when the Bt lines are used, but he said the genetically altered seeds do provide farmers with another tool.

Use of the Bt lines also allows farmers to avoid spreading pesticides and potentially exposing themselves to the chemicals, said Jemison. As far as the unknowns with genetically altered seeds, Jemison said there are also questions about the effects of the insecticides farmers use to counter the same pests controlled by Bt crops.

"There is always going to be a certain amount of uncertainty related to everything," he said.

He said he suspects that the rules that the board of pesticides develops for the use of the Bt seeds will be more conservative than those used by other states.

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# Morning Sentinel

KENNEBEC JOURNAL *Morning Sentinel*

## Bt corn championed, condemned

By DOUG HARLOW  
Staff Writer 11/17/2007



Staff photo by Jeff Pouland

**ADDRESSING AN ISSUE:** Russell Libby, executive director of the Maine Organic Farmers and Gardeners Association, addresses the Maine Board of Pesticides during a public hearing on regulations for the use of genetically modified plants that produce pesticide at Hampton Inn in Waterville on Friday.



Staff photo by Jeff Pouland

**STANDING ROOM ONLY:** It was standing room only at a public hearing before the Maine Board of Pesticides at Hampton Inn in Waterville on Friday.

WATERVILLE -- The executive director of the Maine Biotechnology Information Bureau took to the lectern at a public hearing Friday morning with a raw ear of corn and a packaged bottle of Malathion.

Douglas Johnson, of Stonington, took a bite of the corn and said he can buy and use Malathion, a powerful insecticide, without restriction, but if he wants to raise genetically modified corn -- like the ear he was chewing on -- he will need a state license under proposed rule changes this year.

Johnson's demonstration came during a packed, four-hour hearing before the state Board of Pesticides Control on regulations governing the distribution and use of genetically modified crops that produce their own pesticides.

Farmers say modified plants, especially corn, increase the yield, and in turn their profits. Opponents said it is a dangerous practice -- a backdoor deal with chemical companies -- that could infect other farms when the pollen floats on the wind and is a danger to wildlife and water quality.

Friday's hearing and others this year were called to give the board the information -- and opinions -- it needs to rule on a variety of changes, as early as its next session in December, according to Paul Schlein, public information officer for the board, a division of the Maine Department of Agriculture.

"There's a new section being added ... which deals with PIPs, which are plant-incorporated protectant products - - Bt corn is one of them," Schlein said outside the hearing. "There will be dealer and grower requirements; dealers will be required to keep records of who they are selling to and growers will be required to have a pesticide applicator's license."

Other issues raised Friday for the board's consideration included a buffer zone around areas where Bt (*Bacillus thuringiensis*) corn is raised and which party -- the grower or the abutter -- should be responsible for establishing such a buffer.

"Bt corn can be actually grown in Maine," Schlein said. "The product has been registered in Maine already. That was a separate, parallel process, so a grower can actually buy Bt corn and plant it now, but it's not clear yet what regulations will be in place."

Issues discussed also included protecting grower markets and what is the "acceptable risk" of growing genetically modified products.

"The science is clearly on the side of these products," Johnson said.

While some, mostly conventional farmers, agreed with Johnson, many others present Friday did not.

One by one, opponents of genetically modified organisms stood to say it is an uncertain science, the effects of which, once released into the environment, are irreversible.

Some called it poison and a monstrosity. One woman referred to Bt corn as suicide seed.

Jesse Watson, the father of a young daughter from Rockland, said people are "acting like a bunch of monkeys playing with the building blocks of life."

"This isn't proven technology," Watson said. "We don't know how it's going to affect us long term. The right to be free of toxic feed supersedes the right to grow it for a short-term product."

The board licensed the use of Bt corn in July. Maine was the last state in the nation to license its use.

Maine farmers already raise genetically modified corn called Roundup Ready corn, which is not a pesticide, but is resistant to Roundup, a widely used herbicide for weed control.

Opponents called for a 660-foot buffer zone, others called for a 1-mile zone. The draft rule has no mention of buffer zones.

Still others, including Ingrid Eriksson of Sumner, said there have been no studies on the long-term effects of genetically modified organisms on Monarch butterflies and other beneficial creatures or the plants they live on.

"These are examples of serious difficulties and the flaws in the regulatory system involving Bt corn," Eriksson said. "I believe, of almost greater significance, is the fact that Bt corn byproducts don't remain on the field, as previously assumed, but enter and are dispersed throughout the landscape.

"I propose a moratorium on the use of all Bt crops in Maine until further in-depth studies on the safety and ability to control contamination by such products have been completed."

Farmers, including Thomas Cote of Pittsfield and Jim Crane of Crane Brothers farm of Exeter, said new technologies in farming have allowed Maine farmers to turn a profit, not just break even.

They said products such as Bt corn are part of that technology. Proposed restrictions and rule-making would stand in the way of future farming practices, they asserted.

"Please don't reinvent the wheel on this," Crane told the board.

The comment period on the rule changes expires Nov. 30. The new regulations, if approved or changed by the board, would take effect in January.

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## NON-TARGET EFFECTS OF BT CROPS DATABASE AVAILABLE

L. LaReesa Wolfenbarger

A comprehensive, public database is now available that houses information about studies on the non-target effects of Bt crops (<http://delphi.nceas.ucsb.edu/btcrops>). The database contains information on experimental design and results, and facilitates a quantitative approach to synthesizing the studies on the effects of Bt crops on non-target arthropods.

### How complete is the database?

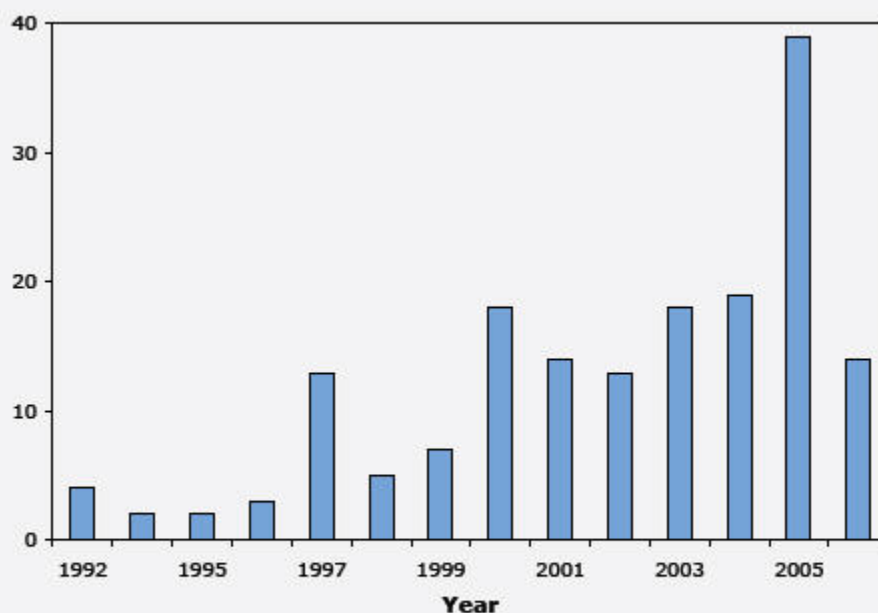
To locate all possible studies to include, Dr. Michelle Marvier and her colleagues queried online databases of articles, such as Agricola, BioAbstracts, PubMed, and ISI Web of Science; conducted general internet searches; searched references within publications; and asked for additional suggestions from over 100 researchers. Each study in the database meets four criteria: 1) it involves a Bt field crop; 2) it measures an effect on a non-target arthropod; 3) its design includes a non-transgenic control or varies exposure levels to Bt plants or their products; 4) it is in English.

### What types of studies are in the database?

The database contains 5,758 experimental comparisons from 171 studies. Studies vary in how many comparisons they contributed to the database with 50% of studies contributing 14 or fewer. Author affiliations for the studies included academic institutions, government, corporations, and non-profit organizations, with the largest contributor being academic institutions (**Table 1**). Publications on the non-target effect of Bt crops on arthropods began in 1992 with the majority of studies published after 2000 (**Figure 1**). The ma-

**Table 1. Author affiliations for 171 studies contained in Non-target Effects of Bt Crops database**

Author affiliation	Number of studies
Academic	83
Academic & Government	26
Corporate	22
Government	21
Corporate & Academic	16
Corporate & Government & Academic	2
Non-profit	1



**Figure 1. Distribution over 15 years of studies on non-target effects of Bt crops**

majority of studies are either lab- (n = 81) or field- (n = 75) based, and a small number contain both field and lab experiments (n = 8) or other approaches (e.g., greenhouse).

### **What type of questions will the database address?**

A wide variety of questions can be answered using the database given how well and how detailed the authors coded information about each study's experimental design, study species, and results. A few possibilities might include questions about the effects on a particular species or group of species, about whether field and laboratory studies produce similar results, or about whether sampling protocols affect results.

As one example, Marvier et al. (2007) reported a meta-analysis on the effects of Bt maize and Bt cotton on the abundance of non-target arthropods. Meta-analysis is a quantitative approach to synthesizing results from multiple studies that have similar experimental designs. For each comparison, the analysis calculates an effect size, which is the difference between the experimental treatment (Bt crop) and the control treatment. A mean effect size is calculated by weighting each comparison by its sample size; therefore, comparisons based on large sample sizes are given more weight than comparisons based on small sample sizes. Similarly, the analysis calculates a confidence interval by weighting the variance associated with each treatment.

Marvier et al. focused on field studies that compared the abundance of arthropods in Bt crops to controls. The authors eliminated non-independent comparisons. For example, some studies report a comparison of abundance calculated from seasonal means and from the peak day. These issues of non-independence are coded in the database, and the user needs to go through the data carefully to ensure that the data chosen are independent. Marvier et al. report on the effects of Bt crops using three different types of experimental and control comparisons: a) a Bt crop vs. the non-transgenic crop; b) a Bt crop vs. the non-transgenic crop + insecticides; and c) a Bt crop + insecticides vs. the non-transgenic crop + insecticides.

The meta-analysis reveals positive and negative effects of Bt crops on non-target arthropods, and the direction depends on the control or the baseline for comparison. If a Bt crop replaces insecticides, then there are more non-target arthropods in the Bt fields. There are fewer non-target arthropods in Bt fields compared to non-Bt fields where no insecticide has been used. The authors point out that both baselines reflect reality in US maize and cotton production. For example, in 2005 insecticides were applied to 23% of maize acreage and 71% of cotton acreage, according to Agriculture Chemical Usage data published by the U.S. Department of Agriculture. The paper cautions that statistically significant differences in arthropod abundances do not easily translate into understanding what ecological consequences these differences would have in agricultural systems or beyond. However, there is tremendous value in being able to draw upon the cumulative efforts and results of many studies to determine what, if any, changes may occur and in what context those changes happen. This database, if used and maintained, will contribute greatly to the advancement of what we have learned about non-target effects of Bt crops and what we need to learn for the future.

### **Reference**

Marvier M, McCreedy C, Regetz J, Kareiva P. (2007) A meta-analysis of effects of Bt cotton and maize on non-target invertebrates. *Science* 316, 1475-1477

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## Engineering Modified Bt Toxins to Counter Insect Resistance

### *Scientists Report Development of New Toxins Seen as Effective Against Bt-Resistant Insects*

Mario Soberón, Liliana Pardo-López, Idalia López, Isabel Gómez, Bruce E. Tabashnik, Alejandra Bravo

A U.S.-Mexico research team has announced the development of new toxins that can kill insects resistant to *Bacillus thuringiensis* (Bt), a naturally occurring microorganism used worldwide to combat crop pests and disease-carrying mosquitoes.

According to an article in the Nov. 1 issue of *Science Express*, the online version of the journal *Science*, the researchers have discovered how Bt toxins "punch holes" in insects' cells.

The researchers said that using this knowledge, they developed the new toxins by "tweaking" the gene that codes for Bt. According to the statement, the new toxins successfully killed a group of Bt-resistant pink bollworms.

"This is the first time that knowledge of how Bt toxins work and how insects become resistant have been used to design toxins that kill resistant insects," research team member Bruce Tabashnik of the University of Arizona in Tucson said in a statement.

"Our goal is to control insects in environmentally friendly ways so we can limit the damage that insects do to crops and the harm they do to people by transmitting disease," he added. "Bt toxins are great for that because they only kill certain insects and don't harm other living things. These new designer toxins give us another environmentally friendly way to control insects."

In addition, Tabashnik said that combatting Bt-resistant pests without using broad-spectrum insecticides can make agriculture safer for farm workers, better for the environment, and more profitable for growers.

But other researchers have questioned the environmental effects of the Bt toxin. For example, a recent study found that a popular type of corn that is genetically engineered to produce Bt could damage the ecology of nearby streams.

Tabashnik and his colleagues, most of whom work at the Universidad Nacional Autónoma de México, said they have applied for a multinational patent for the new toxins.

The Mexican National Council of Science & Technology, the U.S. National Institutes of Health, and the U.S. Department of Agriculture funded the research.

The article, *Engineering Modified Bt Toxins to Counter Insect Resistance*, is available at <http://www.sciencemag.org/scienceexpress/recent.dtl>

# Pesticides could be killing lobster larvae

Last Updated: Thursday, November 29, 2007 | 7:13 AM AT

[CBC News](#)

A government researcher in New Brunswick has found that agricultural pesticides can kill lobster larvae, but whether that's happening in the wild is still in question.

Wayne Fairchild, a scientist with the Department of Fisheries and Oceans in Moncton, is close to publishing results of laboratory research.

**'We're not trying to paint anything here as the one factor.'**

— Wayne Fairchild, DFO scientist

Fairchild told CBC News

Wednesday his team exposed small lobsters to tiny amounts of pesticides. Three insecticides killed or damaged the larvae.

"With everything that's going on in the whole cycle, we're not trying to paint anything here as the one factor, but certainly trying to look at how much of a factor it might be," said Fairchild.

Fairchild is part of a working group of fishermen, government representatives and scientists who have been meeting to talk about the possible effects of pesticide run-off on young lobsters.

The group came together after last summer's fish kills in two Island rivers.

Some lobster fishermen from Nova Scotia asked whether pesticides from those rivers could end up in the Northumberland Strait and damage or kill young lobsters.

Linda MacLean of DFO said the group considered from early on that insecticides in particular could affect lobster larvae.

"A lot of the physiological processes in young developing lobster larvae, especially as they're moulting, are very similar to physiological processes in insects," said MacLean.

"If there are chemicals that are trying to target a certain life stage of an insect, they may also have that same impact on lobster larvae."

The remaining question is whether lobster larvae are, in fact, being exposed to significant levels of insecticide in the wild.

Fairchild said preliminary work has begun to see how much pesticide wild larvae may be exposed to and what that could mean to their survival.



Thousands of fish were killed in the Dunk and Tryon rivers in July. Pesticides were strongly suspected as the cause, but there was not enough evidence to lay charges. (CBC)

# San Francisco Chronicle

## Methyl bromide still finds its way into U.S. fields

Amy Coombs

Saturday, November 24, 2007



Chronicle / Michael Maloney

*Fields containing the toxic gas methyl bromide are immediately covered by sheets of plastic, and warning signs are posted. Chronicle file photo by Michael Maloney, 1997*



The Californian / Clay Peterson

*Application tractors eject methyl bromide into a strawberry field near Salinas. Strawberry farmers are the most common applicants for exemption permits for methyl bromide. The Californian file photo by Clay Peterson via Associated Press, 1998*

Methyl bromide, a common pesticide and fumigant used to kill everything from worms to termites, is at the top of the agenda of the Multilateral Fund for the Implementation of the Montreal Protocol, that reconvenes next week in Quebec. It is targeted because it harms the ozone layer, exposing the Earth to ultraviolet sunlight.

While the United States is technically in compliance with the protocol, the federal government frequently uses a policy that allows it to apply for critical-use exemptions.

There is no limit to the number a country can request, and the United States has been able to continue with as much as 30 to 40 percent of its original methyl bromide use. Sixty percent of all exemptions are sought by the United States, and this number could increase as other countries curtail their use.

Nationwide, strawberry farmers are the most common applicants for exemption permits, along with farmers of winter tomato crops and other out-of-season vegetables.

The Environmental Protection Agency said it receives about 60 exemption permits each year.

To qualify for a permit, there must be no feasible alternative to methyl bromide use, and the transition would have to cause severe market disruption.

The EPA often requires industries to trim their usage requests before passing applications on to the protocol signers for approval, and methyl bromide use has declined over the past two years.

Yet sometimes there isn't another alternative, says the EPA. In Michigan, for example, alternative chemicals require the soil temperature to be above 40 degrees, which means that if farmers give up methyl bromide, they have to wait an extra month to plant.

Even organic farmers have gone on the record as proponents of methyl bromide, according to the EPA. While they can't fumigate their own cropland, organic growers often prefer to buy plants from nurseries that use methyl bromide because it's critical to start with a clean rootstock.

Yet organic farmers in California insist methyl bromide isn't necessary.

"I've never heard that organic farmers believe methyl bromide should be allowed," said Peggy Miars of California Certified Organic Farmers in Santa Cruz.

Miars said farmers must use organically grown stock plants whenever possible, and she confirms that organic strawberry starts are available. As organic farmers in Northern California have grown several generations of high-yield strawberries without methyl bromide, they say the chemical is never the only option.

"Going organic is not as hard as it sounds," said Michael Cohen, a biologist at Sonoma State University who develops alternative soil treatments.

According to Cohen, canola - a yellow-flowering plant of the mustard family grown to make cooking oil and biodiesel - can be used to replace methyl bromide. The seed meal is distributed in specialized gardening stores as a soil treatment.

After the seed is pressed to make oil, it contains lots of glucosinolates - compounds found in horseradish and wasabi paste that become active in water and release the spicy molecules that make your mouth burn. While methyl bromide sterilizes the soil, killing both bad and good organisms, the seed meal selectively targets certain worms and molds that harm plants.

"It also helps stimulate a soil microbial community that prevents disease," said Cohen. "This makes plants more resistant to fungal infections and doesn't harm the ozone layer like methyl bromide."

Numerous other alternatives are also available, although scientists warn many are highly toxic. The EPA approved methyl iodide (iodomethane) as a replacement for methyl bromide on Oct. 5, despite formal warnings from Nobel Prize-winning chemists that the pesticide is highly toxic.

California used 6.5 million pounds of methyl bromide in 2006 - about 22 percent of the nation's total use. Yet California has the strictest methyl bromide regulations in the nation, according to the Division of Pesticide Regulation.

Methyl bromide is a carcinogen, and while farmworkers are most frequently exposed, the chemical has an uncanny tendency to pop up in the home and office. About 20,000 pounds are used in California each year to kill termites, beetles and other bugs. The chemical can drift through pipes that connect buildings, and sometimes results in illness and even fatalities.

In 1997, a 36-year-old Los Angeles woman died after a building near her apartment was fumigated. Underground pipes connected the building to her apartment, and blood tests confirmed that methyl bromide was well above lethal levels.

The Division of Pesticide Regulation said that most cases of poisoning occur when people break into homes that are tarped for fumigation and that companies turn to methyl bromide only in special cases. The chemical hasn't been applied indoors in San Francisco since 2000.

When its Executive Committee meets, the Multilateral Fund for the Implementation of the Montreal Protocol plans to discuss a U.N. report that found developing nations are largely in compliance with phase-out requirements. Of the 191 countries participating in the treaty, more than half are developing nations.

"There are several developing countries that are phasing out methyl bromide earlier than [their] required phase out date," says Megumi Seki, a senior scientific affairs officer at the U.N. Ozone Secretariat.

While methyl bromide was supposed to be phased out of developed nations by January 2005, countries with fewer resources were given an extra 10 years - yet many have made more substantial reductions than the United States, which is also surpassed by other developed nations.

"Countries such as Spain, Greece, Italy and Australia have climates like California and Florida's, and they grow the same crops - tomatoes and strawberries - yet they have almost successfully eliminated methyl bromide," said David Doniger, a policy director at the Natural Resources Defense Council.

"These exemptions are big enough to drive a truck through," said Edward Parson, a professor of law and natural resources at the University of Michigan. "Technically we may be in compliance, but in essence the U.S. just started calling much of its normal use 'critical,' and began relying on exemption permits."

The Montreal Protocol celebrated its 20th anniversary in September, and is largely viewed as an international success story as atmospheric levels of ozone-depleting chemicals are beginning to drop.

Gases such as methyl bromide accumulate in the atmosphere, where they convert ozone molecules to oxygen. Chlorofluorocarbons (CFCs) - the chemicals found in spray paints and aerosol hairsprays in the 1970s and 1980s - are perhaps the most famous culprits, but methyl bromide is thought to be 50 times more damaging. It binds more tightly to oxygen atoms and prevents them from re-forming ozone molecules.

"We have led the world in reducing CFCs and other ozone-depleting chemicals," Doniger said, "but the combination of methyl bromide and the Bush administration has been toxic."

Because the United States lowered other uses, the protocol's signers have been lenient with methyl bromide requests, but this tide is beginning to turn, Doniger said.

"There are complaints from some that the amounts (of exemptions) being requested are quite a lot," says Seki, "and there are questions regarding how much effort the USA is making to phase out the critical uses fast."

The biggest public-health hazard comes from the chemical's long-term impact on the ozone layer, scientists say. Because methyl bromide is a halogen - a class of chemicals that contain atoms from the 17th column of the periodic table (in this case bromine) - it is slow to degrade in the environment.

Halogens are extremely stable, a trait that makes them appealing to industry, but they are also slow to degrade in the air, soil and water. As UV light from the sun is a primary cause of skin cancer, the EPA projects that declines in methyl bromide, CFCs and other ozone-depleting chemicals could potentially save millions of lives for the next 60 years.

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*<http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/11/24/HO5BTBGR0.DTL>*

*This article appeared on page **F - 10** of the San Francisco Chronicle*



Wednesday » November  
21 » 2007

## Victoria opts to cut pesticide use

### A draft bylaw to curb but not ban the chemicals gains preliminary approval

**Carolyn Heiman**

CanWest News Service

*Friday, November 16, 2007*

VICTORIA - A draft bylaw intended to curb pesticide use the city is weak and "full of loopholes" say critics, including the Canadian Cancer Society and one of the city's advisory committees.

But Victoria councillors this week gave preliminary approval to a "pesticide use reduction" bylaw which, if passed, will allow the city to use pesticides on its own fields without permits but require residents to obtain \$25 permits in some situations.

Businesses would be exempt from the bylaw, as city staff advised council the community charter giving municipalities the right to regulate pesticides did not extend to commercial enterprises.

Lehna Malmkvist, head of the city's environment and shoreline advisory committee, said the committee wants the application of pesticides to be the exception rather than the rule, and the way the city's bylaw is worded, "that's not clear."

In an e-mail, the committee urged council to strengthen the bylaw "and make Victoria a leader on this issue in the Capital Regional District."

In particular it noted "the CRD model bylaw banned the use of pesticides, period, whereas the Victoria bylaw has a number of loopholes. The CRD model bylaw was simple and easy to understand. It was also the result of much consultation and consideration."

The CRD draft bylaw required that adjacent landowners be given written notice when a pesticide is applied. No such provision is made in the city bylaw, an issue also highlighted by the environment committee.

In 2005, a CRD subcommittee drafted a model bylaw for the 13 area municipalities -- which have the jurisdiction to regulate pesticide use -- to consider.

While the CRD doesn't have the authority to regulate the area, it was hoped that crafting a model bylaw would result in unified regulations throughout the region. But almost all municipalities rejected the draft.

Victoria council agreed to go forward with a pesticide bylaw but asked its staff to come back with a made-in-Victoria version. The CRD, meanwhile, is working on a public education program.

In a report to councillors, Michelle Gorman, the city's integrated pest management coordinator, warned that sports fields could become dangerous and pest-infected trees might die if pesticides were not included in the city's arsenal.

Since the pesticide issue arose in 2005, council has received a steady stream of

correspondence, almost all urging the municipality to develop tight rules on pesticide use.

"I do not believe that we should risk our children's health in order to have perfect lawns," Caspar Davis wrote to council, adding that he supported pesticide rules extending to a ban on sales.

Nancy Falconer, community action coordinator for the Canadian Cancer Society, Vancouver Island Region, wrote to council commending it for steps taken so far, but said the draft bylaw had limitations, including its definition of non-essential use of pesticides, areas where the bylaw doesn't apply and the permitting procedure.

The Canadian Federation of Independent Business wrote the lone letter urging the council to focus on public awareness "on the responsible use of pesticides and lawn care alternatives rather than implementing a ban or severe restrictions on pesticide use."

Meanwhile, Dr. Richard Stanwick, chief medical health officer for the Vancouver Island Health Authority, wrote Gorman saying the city "has struck an appropriate balance in its proposed bylaw and have addressed as what could be perceived as competing interests."

Stanwick rejected the position taken by the Canadian Cancer Society, calling Falconer's position "extreme" and discounting some of the research papers commonly used to support strong rules around pesticide use and linking some chemicals used in pesticides to cancer.

He urged the city to commit to reforming the bylaw should new research become available.

An estimated 130 communities in Canada have bylaws regulating pesticides and in Quebec the province has enacted a ban. Ontario is being lobbied by medical and environmental organizations for similar laws.

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## Listening to activists can cause cancer

**Dan Gardner**

The Ottawa Citizen

*Saturday, November 03, 2007*

Here are two words that did not appear in headlines on Thursday: "pesticides" and "chemicals."

That's significant because the day before, the American Institute for Cancer Research released a mammoth report on diet and the causes of cancer. The peer-reviewed product of five years' work by 21 leading scientists, the report synthesized vast quantities of scientific research and came to some clear conclusions. "The evidence that excess body fat increases the risk of developing cancer is much stronger now than ever before," says an AICR press release, while "evidence linking consumption of alcohol, red meat and processed meat to increased risk is also deemed convincing."

Diet and exercise alone could eliminate one-third of all cancers, the report found. Not surprisingly, it got an enormous amount of media attention around the world.

But in all the news stories that followed, there was scarcely a word about the chemicals -- particularly pesticides and herbicides -- that so many activists insist are a major cause of rising rates of cancer. And so the activists spoke up.

"The encouraging and important message about diet, exercise and obesity only tells part of the cancer story," wrote Angela Rickman, executive director of Prevent Cancer Now, in a letter to the Globe and Mail. "These factors, even when considered with improved detection and an aging population, do not explain the global growing incidence of cancer. We must also examine the role of chemicals in our in our homes, workplaces and schools, in our cleaning products, shampoos and thousands of consumer products, and in our air, soil and water."

That's the mantra: There is an epidemic of cancer; chemicals are to blame; getting rid of these evil contaminants is the best way to fight cancer.

As I've written before -- and will again -- the mantra is false. "There is no epidemic of cancer other than that due to smoking," writes Bruce Ames, a scientist at the University of California, Berkeley, and one of the world's leading cancer researchers. And even if there were a cancer epidemic, there would be little reason to blame chemicals. "Neither epidemiology nor toxicology supports the idea that exposures to synthetic industrial chemicals at the levels at which they are generally found in the environment are important as a cause of human cancer."

The AICR report released Wednesday did not deal with the whole, vast question of chemicals and cancer, but it did look at one important aspect of the issue: pesticide residues on food. So what did it find?

"The report said that we don't have enough data," says Karen Collins, nutrition adviser with AICR. "It's possible that that could be an issue but at this point we don't have enough data to say that it is."

That's the scientific way of putting it. Here's what happened in plain English: When the scientists gathered all the research on cancer and pesticide residues, they discovered that there was so little it didn't allow them to draw conclusions.

So when activists say we should worry about pesticide and herbicide residues on food, they are not presenting a realistic concern grounded in scientific evidence. They are speculating. Fantasizing. Making it up. They are telling scary stories which far too many journalists accept uncritically and pass on to the public.

As a result, public awareness of cancer risk factors is skewed. In an opinion survey AICR also released this week, the institute noted with regret that only 49 per cent of Americans identified a diet low in fruits and vegetables as a cause of cancer; 46 per cent said the same of obesity; 37 per cent, alcohol; and 36 per cent, diets high in red meat.

But 71 per cent said pesticide residues on food cause cancer. "There's a disconnect between public fears and scientific fact," Collins says.

That disconnect is a big reason why organic produce has become a booming industry. If you think pesticide residues can kill, buying lettuce grown without pesticides seems like a pretty reasonable thing to do.

But it won't help. "There is no evidence that eating organic produce is going to reduce your risk of cancer," Collins says.

In fact, going organic may do precisely the opposite.

Organic produce costs more. As a result, people on limited budgets who switch to organic may buy and eat less produce. And that's a terrible mistake.

There is plenty of evidence that a diet rich in fruits and vegetables reduces the risk of cancer, Collins says. "The research is quite clear that what is important is eating an abundance of fruits and vegetables rather than worrying about whether it's organic or conventionally grown."

By scaring people with phantom fears about pesticides and cancer, activists may convince them to do something that actually increases their risk of cancer.

The activists will never accept this, of course. But as Ms. Collins says, the research is quite clear.

Dan Gardner writes Wednesday, Friday and Saturday. E-mail: [dgardner@thecitizen.canwest.com](mailto:dgardner@thecitizen.canwest.com)

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## **Pesticide fumes sicken residents at Providence apartment complex**

**AP** Associated Press

December 3, 2007

PROVIDENCE, R.I. --Fumes from an extermination treatment have sickened two people at a Providence apartment complex.

The incident happened on the third floor of Carroll Towers in the Smith Hill section of Providence.

Assistant Fire Chief Michael Dillon says a resident opened an apartment door shortly after an exterminator fumigated an apartment, spreading the fumes in the building. Several people needed medical treatment after inhaling the vapors.

A hazardous materials team was called in to assist with the cleanup.

Dillon says four firefighters were sent to Rhode Island Hospital as a precaution. ■

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