



# Farm Update 2010

## A New Decade of Genetically Modified Crops in Ontario

**IT'S ALMOST 15 YEARS SINCE THE FIRST GENETICALLY MODIFIED (GM) CROP WAS INTRODUCED IN CANADA.** Now, half of all the grain corn and soy grown in Ontario is GM, and almost all of the white sugar beet in Ontario is GM. <sup>1</sup> **GM corn, canola, soy and sugar beet** are on the market for Canadian farmers, with two types of GM traits: herbicide tolerance and insect resistance. Companies are now combining or “stacking” these GM traits together.

### STACKED TRAIT TAKEOVER?

#### What is “Stacking”?

Stacking GM traits can produce “all-in-one” seeds that combine multiple insect resistant traits with herbicide tolerant traits. Stacked GM trait products like SmartStax corn are produced through conventional breeding of GM plants.

Herbicide tolerant traits (such as Monsanto’s Roundup Ready trait, for example) mean the plant can withstand early spraying of herbicides with glyphosate or glufosinate, allowing the use of these herbicides on crops that would otherwise also be killed along with the intended weeds.

Insect resistant traits mean the plant itself will produce insecticidal toxins. This trait is achieved by inserting genes from the soil bacterium Bt (*Bacillus thuringiensis*) which produces crystal-like proteins that become active when eaten by insects with a specific digestive enzyme that converts the protein into a toxin.

Stacked trait GM seeds can carry protection against many types of potential pest infestations and combine different traits for convenience...but the seeds are also more expensive and may soon dominate the seed market, eliminating other choices for farmers.

#### Potential Issues with Stacked GM Traits

**HIGHER PRICES:** Stacking GM traits together in one seed means that biotechnology corporations like Monsanto can charge more money, because farmers are buying even more of their patented gene technology. Monsanto says they will soon add even more GM traits to their eight-trait SmartStax corn, for example. Monsanto is charging up to 42% more for its SmartStax corn.

#### What is “SmartStax” Corn?

SmartStax is a new corn, developed by Monsanto and Dow AgroSciences, with eight GM traits – 6 for insect resistance and 2 for herbicide tolerance. SmartStax corn is resistant to many types of corn borers, the western bean cutworm, black cutworm, and the fall armyworm.

This is the first time that more than three GM traits have been stacked together in one seed.

SmartStax caused international controversy because it was approved in Canada and the US in 2009, for planting in 2010, but was not assessed for safety as a new GM crop.

In Ontario, it will be sold by Monsanto via DEKALB as Genuity SmartStax.

**LESS CHOICE:** It is in the interests of companies to sell seeds with as many patented GM traits as they can. It may quickly become very difficult for farmers to find seeds that carry just one or two GM traits. Farmers could be paying for seeds with many GM traits that they do not need or want, because there are no other choices in the seed market.

**NEW SAFETY QUESTIONS:** Not all stacked GM trait products are evaluated for safety by the Canadian government. If Canadian regulators have already assessed individual GM traits for safety in other products, then they do not see the need to ask new safety questions when these traits are combined together. This approach is highly controversial. Without rigorous regulation from government, farmers will be more vulnerable to decreasing trust from consumers, new safety questions, as well as possible product recalls in the future.

## WHAT ARE THE CONCERNS WITH SMARTSTAX?

### No Safety Assessments for SmartStax Corn

Health Canada did not conduct a safety assessment for SmartStax and the Canadian Food Inspection Agency (CFIA) did not conduct a full environmental safety evaluation. Canadian regulators exempt stacked GM products from safety assessments if they have already approved the individual GM traits in other products.

The CFIA and Health Canada do not actually classify SmartStax corn as a “Plant with Novel Traits” or a “Novel Food” (the categories Canada uses to regulate GM crops and foods) because they have already approved the eight single GM traits that are in SmartStax. Health Canada says that combining eight GM traits together does not produce any new risks and does not require any new safety evaluation.

This approach is not consistent with European regulations or with the international food safety guideline that Canada negotiated at the UN (Codex). This means that Canadian exports of stacked GM crops could be legitimately blocked by other countries. The UN guideline is clear that foods from stacked crops, with stacked GM traits, should go through a full safety assessment for new unintended effects.

### Dramatic Cut in Refuge Area for SmartStax

Refuge areas are a percentage of a Bt (insect resistant) crop area planted with non-Bt crops and is an important strategy to slow insect resistance. By giving insects somewhere to go, some insects remain susceptible to the Bt toxins.

The CFIA reduced the size of the refuge area required for SmartStax from 20% to 5%. The cut in refuge could speed the evolution of insects that are resistant to Bt, making Bt useless for pest control in the future.

Bt (*Bacillus thuringiensis*) is a naturally occurring soil borne organism that can be used topically by organic farmers to control pests. The genes from Bt have been genetically engineered into corn to make the plant act as a pesticide. Bt crops are speeding the development of insect resistance because the GM plants express the Bt toxin in every cell, all the time.

The new reduction of refuge areas from 20% to 5% also means that Monsanto can sell 15% more SmartStax seeds to farmers.

## COSTS OF GM CONTAMINATION INCREASE

The genes from any crop can readily move through seed and pollen flow and there are no failsafe legal, physical or biological mechanisms to separate GM from non-GM crops of the same species. This was first clearly seen in Canadian canola when Manitoba research in 2002 found that 14 of 27 certified seedlots had glyphosate tolerant contamination levels above 0.25%, and 3 had levels above 2%.<sup>2</sup>

Economically disastrous contamination is a new reality for Canadian flax farmers and will be a concern with the introduction of any new GM crop such as GM alfalfa and GM wheat.

As in the case of Canadian flax, contamination can destroy export markets where countries have not approved GM crops for consumption. GM contamination can also cost organic farmers, whose production process prohibits the use of GM seeds. Because of GM contamination, for example, organic grain farmers in the Prairies have lost their domestic and export markets for canola. They have also lost the use of canola as a rotation option.

Additionally, farmers bear the costs of testing and clean-up when contamination happens. Corporations that own GM traits have not yet been forced to accept liability.

The containment of GM crops is also a serious concern because the unwelcome transfer of patented gene technology to non-GM crops may subject farmers to litigation by corporations for patent violation.

## GM ALFALFA ON THE HORIZON



Farmers who grow alfalfa agree that they do not need Monsanto’s GM Roundup Ready alfalfa and that GM contamination would be an economic disaster. Conventional and organic farmers, including livestock producers and dairy farmers, honey producers and sprout and seed producers, would all be affected by GM contamination.

Canada approved Monsanto’s Roundup Ready alfalfa for growing in 2005 but it will not be legal to sell the seeds until Monsanto requests variety registration from the CFIA. This could happen at any time and new changes to Canada’s seed regulations could make this process easier and quicker for Monsanto.

Meanwhile, a ruling in the US that prohibits the planting of GM alfalfa in that country may soon be overturned. In 2007, a district court ruled that the US Department of

## FLAX FARMERS LOSE EXPORT MARKETS TO GM CONTAMINATION



In 2009, Canadian flax farmers lost their export markets because of unexpected GM contamination.

Canada was the world's leader in the production and export of flax, and flax was one of our five major cash crops.

GM flax was approved in Canada in 1998 but flax farmers forced the GM flax off the market in 2001

in order to protect their export markets. They did this by convincing the CFIA to remove variety registration for the GM flax, making it illegal to sell the seeds.

The GM flax was clearly developed without a mandate from farmers. The GM flax (tolerant to herbicide residues in soil) was developed by controversial scientist Alan McHughen when he worked at the University of

Saskatchewan. McHughen called the GM flax, "Triffid" in reference to John Whyndham's horror novel, "The Day of the Triffids" which features terrifying flesh-eating plants farmed for oil.

The GM flax was never commercially grown in Canada and is not approved outside of Canada and the US. In 2001 about 40 seed growers were multiplying 200,000 bushels of seed for future use but this was all crushed when the flax was taken off the market that year.

In order to reopen export markets, some grain companies are saying that farmers should be required to only plant certified flax seed. Around 75% of farmers save their flax seed. The loss of farm-saved flax seed would mean higher input costs and the possible loss of locally adapted seed. If grain companies succeed, this could lead to long-term requirements for mandatory purchases of certified seed in flax and other crops.

Agriculture (USDA) did not adequately consider the environmental and economic impacts of GM alfalfa before it was approved. The court ordered the department to conduct a risk assessment and in late 2009, the USDA released its draft Environmental Impact Statement (the first time it has conducted this type of analysis for any GM crop.)

If GM alfalfa is planted in the US, it will quickly contaminate Canadian crops.

Contamination and cross-pollination with GM alfalfa is inevitable because alfalfa is pollinated by bees that travel many kilometres and GM alfalfa for hay production is often cut after blooming starts, giving bees and other pollinating insects an opportunity to transfer pollen from the GM crop to other alfalfa seed crops. Additionally, alfalfa seed crops produce a percentage of hard seed that can germinate several years after a field has been ploughed up.

Over 86 producer and consumer groups in Canada have signed a joint statement opposing the sale, trade and production of GM alfalfa ([www.cban.ca/alfalfa](http://www.cban.ca/alfalfa)). But there is currently no mechanism by which the Canadian government can stop a GM crop based on the economic concerns of farmers. The government does not conduct any assessment of the potential market harm of introducing a new GM crop.

### UNCERTAIN FUTURE FOR GM SUGAR BEET

Ontario and Alberta sugar beet farmers are growing Monsanto's Roundup Ready sugar beets for sugar processing but they may soon be the only farmers in the world growing GM sugar beet. US farmers are currently growing GM sugar beet but in September 2009, a US Federal Court ordered the US Department of Agriculture to conduct an assessment of the environmental and economic impacts of GM sugar beet on farmers.

The US ruling responded to contamination concerns from farmers in the Willamette Valley of Oregon who produce all of the sugar beet seed used in North America. Growing GM sugar beet in the area would jeopardize genetic purity and the export and organic markets for these farmers. The reality is that the Valley is not big enough to provide adequate isolation (six miles) between GM sugar beets and conventional beets and Swiss chard.

### HERBICIDE-RESISTANT WEEDS ON THE RISE

A 2009 report found that the amount of herbicides used on GM crops has increased in the past 10 years, not decreased as might be expected.<sup>3</sup> Using US Department of Agriculture data, the authors found that the amount of herbicides, particularly Roundup, used on soybeans, corn and cotton increased from 1996 to 2008 by approximately 7-8%, with a particularly sharp increase from 2005 onwards. They contend that this increase is largely due to the emergence of Roundup-resistant weeds.

In the South-eastern US, glyphosate-resistant Palmer amaranth (a pigweed) is now severely affecting nearly a million acres of soy and cotton crops. There are no confirmed glyphosate resistant weeds yet in Canada but in the US, a total of 13 weed species including Giant Ragweed, Common Ragweed and Canada Fleabane, have biotypes resistance to glyphosate.

## **MONSANTO'S SEED MONOPOLY?**

Patent laws which were designed to provide inventors with exclusive rights to use, sell or manufacture their inventions for a set time, are now being applied to living organisms, genetic material and plant cells. Companies can make genetic changes to a plant and claim the gene sequences as an invention.

These patents can make age-old farm practices, such as saving seeds, illegal. The Canadian Supreme Court ruled in 2004 that simply having patented genes on your land or in your crop is illegal patent infringement, no matter how the genes were introduced onto the farm. Already, Monsanto has sued hundreds of farmers across Canada and the U.S. for alleged unauthorized use of their intellectual property. Monsanto calls this "Seed Piracy."

A new precedent was set in October 2009 when Monsanto successfully sued 4 Ontario soybean farmers for unauthorized use of Monsanto's Roundup Ready soybeans. The farmers were forced to pay their profits and interest to Monsanto as well as a large part of Monsanto's legal costs.

The farmers were also placed on Monsanto's new "Unauthorized Growers List" which prohibits them from purchasing Monsanto products in the future. Their names were also publicized.

Monsanto says, "Monsanto makes every effort to settle out of court with those who have infringed our patents. However, if a grower decides to take matters to the court, they will no longer be permitted to purchase and utilize Monsanto technologies in the future."<sup>4</sup>

Monsanto is also using patent law and other legal mechanisms to increase its control over the seed market. For example, about 150 seed companies license the Roundup Ready trait from Monsanto and Monsanto uses these agreements to control which other genetics the competing companies can mix with the Roundup Ready trait.<sup>5</sup>

Monsanto's patent on Roundup Ready 1 expires in 2014 and with it, a revenue stream of maybe half a billion dollars a year in royalties – unless it can switch farmers over to its Roundup Ready 2 technology. The US Department of Justice has launched an antitrust investigation into Monsanto, demanding internal documents on its marketing

tactics. The US government is examining whether farmers and seed companies will have access to Roundup Ready soybeans after the patent expires.

## **Monsanto**

- is the largest seed company in the world
- owns 86% of all GE seed planted globally
- owns the top selling herbicide Roundup
- owns the patent on Terminator technology – seeds that are engineered to be sterile after first harvest to stop farmers from saving seed

In cases against farmers, the courts may award Monsanto:

- Damages substantially higher than the price of GM seed
- Litigation/Investigation costs
- Delivery up/forfeiture of crops

Monsanto also reserves the right to "public awareness" whereby it can publish the names of the farmers on its "Unauthorized Grower List"

## **Endnotes**

1. Statistics Canada, *Field Crop Reporting Series*, June 2007. P.8.
2. Friesen, Lyle, et al. "Evidence of contamination of pedigreed canola (*B. napus*) seedlots in Western Canada with genetically engineered herbicide resistance traits," *Agronomy Journal* (95), 2003.
3. Charles Benbrook, "Impacts of Genetically Engineered Crops on Pesticide Use: The First Thirteen Years" The Organic Center, USA. November 2009
4. Monsanto Canada "Seed Piracy Updates and Summaries: Eastern Canada Update" October 2009.
5. "Monsanto GMO Ignites Big Seed War" US National Public Radio, Frank Morris, January 12, 2010.



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