



TECHNICAL BACKGROUND ON GENETICALLY ENGINEERED CORN IN CANADA

Canada is a small but significant player on the world corn market, producing only one per cent of global corn production (nine million tonnes (mt) out of 750 mt globally.) Canadian production is closely tied to the US, the largest corn producer worldwide. The introduction of genetic engineering (GE) in US agriculture has had a major impact on Canadian production. Conversely, regulatory and consumer changes in Canada can have significant implications for GE in the US. GE corn has been grown commercially in Canada since 1996. Today, GE corn is grown on a widespread commercial scale in Ontario, Quebec and Manitoba, with smaller amounts grown in B.C., Alberta and the Maritimes.

Most corn grown in Canada is used for animal feed, only 1.5 per cent is grown as sweet corn, the kind we find at the market as corn-on-the-cob or canned kernel corn. The remainder is processed into a wide variety of ingredients such as corn fructose or starch, as well as for fuel and alcohol production. Subsidies to the biofuel industry, along with a public perception that corn ethanol could be a factor in reducing greenhouse gas emissions has provided a dramatic boost to the corn industry in the past two years. Corn price and corn production in Canada have both climbed.

Last year, 12,000 hectares of corn were grown commercially in B.C., most of it as silage for the dairy and cattle industry. Silage is a product made by fermenting the whole corn plant shortly after harvest in the fall. Although not directly consumed by humans, GE silage corn enters the food chain mostly through non-organic milk and dairy products, as well as through the contamination of other corn supplies. Most GE corn grown in B.C. contains the gene NK603, which has shown signs of toxicity in feeding test trials.

The Canadian government anticipates growing 4.6 million tonnes of corn for ethanol production by 2009-2010. This represents approximately half of all corn currently produced in the country. This development could lead to increased GE corn production in Canada unless measures are taken to reverse the increasing use of GE corn cultivation.

- About 50 per cent of corn planted in Canada is GE (50 per cent for soya; 95 per cent for canola) (52 per cent corn is GE in the US and 62 per cent in Argentina)
- GE corn represents 14 per cent of all agricultural land cultivated with GE crops in Canada (72 per cent canola and 12 per cent soya)
- Total hectares planted with GE crop in Canada: 5,858 000 hectares, which represent about twice of the area of Vancouver Island or nearly the entire area of New Brunswick.
- GE corn in Canada: 820 000 hectares, or the equivalent of about one and half time the size of Prince-Edward Island, 13 times the size of the City of Toronto or 2.5 times the Greater Vancouver area.
- GE corn plantation in Ontario jumped by 53 per cent in 2007 fuelled largely by the policy of the Federal government promoting corn-ethanol.
- Two types of GE corn in Canada: (1) herbicide-resistant (about 37 per cent of total) and (2) insect-resistant (about 66 per cent of total) or combination of both.
- Vast majority of GE corn marketed in Canada include genes MON810, MON863 or NK603.
- Total Canadian corn exports: \$58 millions; imports: \$290 millions (2005)
- Total Canadian corn farm gate value: \$885 millions

Genetically engineered (GE) corn authorized in Canada

- 1) **Monsanto LY038 corn**: Increased level of lysine for animal feed applications. Authorized 2006
- 2) **Dow AgroSciences Bt Cry1F corn**: Resistance to a variety of insect pests including European corn borer, also tolerance to glufosinate-ammonium (Bayer Liberty brand) herbicide. Authorized 2006.
- 3) **Monsanto MON88017 corn**: Resistance to Western and Northern Corn Rootworms. Tolerance to Glyphosate-based (Monsanto Roundup) herbicides. Authorized 2006.
- 4) **Dow AgroSciences & Pioneer Hi-Bred Production Herculex RW corn**: Resistance to Western and Northern Corn Rootworms. Tolerance to glufosinate-ammonium herbicide. Authorized 2005.
- 5) **Monsanto MON863**: Resistance to Western and Northern Corn Rootworms. Authorized 2003.
- 6) **Dow AgroSciences & Pioneer Hi-Bred 1507**: Resistance to a variety of insect pests including European corn borer, also tolerance to glufosinate-ammonium herbicide. Authorized 2002.
- 7) **Monsanto NK603**: Herbicide tolerance to glyphosate (Roundup). Authorized 2001.
- 8) **Monsanto GA21**: Herbicide tolerance to glyphosate (Roundup). Authorized 1998.
- 9) **Monsanto MON802**: Resistance to European corn borer, Herbicide tolerance to glyphosate. Authorized 1998.
- 10) **Dekalb (Monsanto) DBT418**: Resistance to European Corn Borer, tolerance to the herbicide glufosinate ammonium. Authorized 1998.
- 11) **Bayer Liberty Link T14**: Tolerance to the glufosinate ammonium herbicide Liberty™. Authorized 1998.
- 12) **Bayer Liberty Link T25**: Tolerance to the glufosinate ammonium herbicide Liberty™. Authorized 1998.
- 13) **Monsanto MON810**: Resistance to European corn borer. Authorized 1997.
- 14) **Monsanto MON809**: Resistance to European corn borer. Herbicide tolerance to glyphosate. Authorized 1997.
- 15) **Dekalb (Monsanto) DLL25**: Herbicide tolerance to Glufosinate ammonium. Authorized 1996.
- 16) **Syngenta X4334CBR & X4734CBR**: Resistance to European Corn Borer. Herbicide tolerance to glufosinate ammonium. Authorized 1996.

GE Corn applications pending:

- 1) **Monsanto MON89034**: Insect resistance
- 2) **Dow AgroSciences TC6275**: Insect resistance

Sources:

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