



Factsheet

Genetically Engineered “Non-Browning” Apple

August 2012

A small BC company called Okanagan Specialty Fruits is asking Health Canada and the Canadian Food Inspection Agency to approve a genetically engineered (also called genetically modified or GM) “non-browning” apple. The company has also asked for approval in the United States.

What is the GM Apple?

The “non-browning” apple is genetically engineered to keep from going brown after being cut. The apple is designed for fast food companies and food processing companies, so they can use sliced apples in packaged foods.

When apple flesh is cut and exposed to oxygen, it begins to brown. But the GM apple or “Arctic Apple,” as the company calls it, “will decay naturally just like any other apple, but it will not turn brown from bruising, cutting or biting – not in minutes, hours or days.” In fact, the company has told reporters the GM apple will not brown for 15 to 18 days.”

But browning in fruit is not a problem - it’s helpful information for consumers. The “non-browning” GM apples are designed to look fresh when they’re not.

The company wants approval for GM Golden Delicious and Granny Smith apples but they also say they will engineer Gala and Fuji apples.

When Could the GM Apple be Approved?

The GM apple could be approved in the U.S. in 2012 or 2013. The company says the apple could be approved in Canada in 2014 but there’s no timeframe for a decision. The company asked for approval in the U.S. in March 2010 and sent their request to Canada in December 2011.

No GM apples have been approved anywhere in the world.

How Did the Company Engineer the Apple?

The company silenced a gene in the apple (that controls browning) by inserting modified apple DNA along with genetic sequences from three different species:

Summary: What’s the Problem?

- Consumers don’t want the GM apple.
- The GM “non-browning” apple will be misleading to consumers because it will look fresh when it’s not.
- BC apple growers have already rejected the GM apple.
- Contamination from GM apples is a risk to organic apples and to the market for all Canadian apple producers.
- Health Canada and the Canadian Food Inspection Agency are using public funds to review a GM apple that no one wants.
- The federal government has not consulted with farmers and consumers and does not consider economic or social concerns before it approves a new GM crop.

1. A regulatory gene switch from a plant virus (Cauliflower Mosaic virus promoter: CaMV 35S);
2. A terminator sequence from a bacterium (*Agrobacterium tumefaciens* taken from its Nopaline synthase gene: nos);
3. An antibiotic resistance marker gene from a bacterium (*Streptomyces kanamyceticus*), here the nptII gene (which confers resistance to the antibiotic kanamycin).

The technology was developed in Australia and licensed by Okanagan Specialty Fruits.

What is the Contamination Risk?

We cannot control where apple seeds and pollen from GM apple trees will go.

- **Bees and Pollen**

Apples are pollinated by bees. The company says that bees will stay very close to their hive when there is enough food (like when an orchard is in bloom) and so the risk of contamination from bees is small. However, there are approximately 450 native bee species in BC and the Yukon and there are many small orchards that support a great variety of these wild/native bee species.

The company also says that, “dense orchard plantings and buffer rows make it very difficult for bees to maneuver far, so the risk of bees carrying pollen far enough to be an issue is almost nonexistent.”ⁱⁱⁱⁱ But many orchardists disagree with this assertion, especially when they consider the behavior and diversity of native bees.

The company also refers to “grower stewardship standards” that they will set up to limit the contamination risk. They say these standards will define buffer distances between GM apple orchards and other apple orchards. However, so far, the cost and set up of buffer zones has been the burden of organic farmers and other growers who want to protect their crops from GM contamination. There is no guarantee that the company will set up such standards or that they will be able to enforce them.

- **Apple Seeds**

While apple seeds do not breed true, they can germinate and could result in GM apple trees. There are many ways that GM apple seeds can spread including compost piles, animals, discarded apple cores, and deliberate plantings.

What Happens to our Apples if GM Pollen Spreads?

If an apple tree is pollinated with GM pollen, the genes would be present in the resulting apple seeds, not the apple flesh. If pollen from GM apple trees moves into a non-GE apple orchard, some seeds in apples from the non-GM trees that were pollinated could carry the new gene sequence and could express the new GM trait.

Consumers Oppose the GM Apple

69% of Consumers don't want to eat the GM apple, according to a 2012 poll commissioned by the B.C. Fruit Growers' Association and the Quebec Apple Producers Association.

The U.S. Apple Association says, "Consumers like their apples and are not calling for these new "nonbrowning" cultivars."

Apple Growers Oppose the GM Apple

Contamination from GM apples threatens the future of our apples, and the farmers who grow them.

- The BC Fruit Growers Association opposes the GM apple.
- The U.S. Apple Association "does not support the approval of this product."^{iv}
- Early last year the Washington-based Northwest Horticultural Council asked the U.S. Department of Agriculture to stop the GM apple

BC Growers Rejected the GM Apple Over Ten Years Ago

In 2001, BC apple growers stopped the GM apple from being field tested in Canada. The federal government agricultural station in Summerland in the Okanagan valley, an important fruit growing area, was preparing to start field trials but BC growers who were concerned about contamination stopped these field trials from happening. As a consequence, the company has tested all their apple trees in the U.S.

The GM Apple is Not Necessary

The technology is unnecessary as there are already techniques that slow browning – in our kitchens, we use lemon juice and the food service industry uses ascorbic acid (vitamin C).

There are also varieties of naturally slow-browning apples, like Ambrosia which is grown in BC.

"Apples are healthy and nutritious they way they are. Browning is a natural process that results from exposure to oxygen. There are already naturally low-browning apples in the marketplace. In addition if you just put some vitamin C fortified apple juice on sliced or cut apples it will also prevent browning."
- Mark Gedris, Director of Membership & Communications for U.S. Apple Association (Fruit Grower Report, June 16, 2012, www.agrinfo.net)

Take Action

1. In BC: Sign the petition and collect signatures www.okanagangreens.ca
2. Write to your provincial Minister of Agriculture
3. Write to the federal Minister of Agriculture
4. Check www.cban.ca/apple for actions and updates

More Information: www.cban.ca/apple

Donate Today! www.cban.ca/donate



ⁱ <http://www.okspecialtyfruits.com/arctic-apples/about-our-nonbrowning-apples>

ⁱⁱ "Okanagan GM apple doesn't go brown when sliced," May 18, 2012, Sam Redding, Kelowna Daily Courier

ⁱⁱⁱ <http://www.arcticapples.com/blog/joel/cross-pollination-concerns-don%E2%80%99t-bee-lieve-it#.UClI6mNSSQY>

^{iv} <http://www.usapple.org/consumers/all-about-apples/consumer-updates-information>