

Multi-state investigation finds GMO sweet corn is rare in U.S. stores

Background and Introduction

As sweet corn crops arrived at grocery stores across the United States in the summer of 2013, we wanted to know: Was this the same corn on the cob we've been eating all our lives, or was it a new type of corn that has been genetically engineered to contain an insecticide and withstand herbicides? There was only one way to find out. Over a four-month period, Friends of the Earth gathered dozens of sweet corn samples from across the U.S. and tested them to determine if they were genetically engineered.

This is the first analysis of this scope and type to look for genetically engineered sweet corn available to consumers in grocery stores and farmers markets across the United States, and it was conducted during a pivotal time for the nation's sweet corn crops.

Most genetically engineered crops grown and sold in the United States – including roughly 85 percent of field corn crops – end up in processed food or animal feed. Very little fresh produce sold in the U.S. has been genetically engineered, with the exception of a variety of papaya and a small amount of squash. While Syngenta has offered a genetically engineered sweet corn for about a decade, most farmers have opted not to grow it. But the sweet corn market may be changing.

In the fall of 2011, Monsanto began selling seedsⁱ for its first direct-to-consumer genetically engineered product, Seminis® Performance Series™ sweet corn. The corn is a “stacked trait” product that contains multiple genetically engineered traits – three Bt-toxin insecticidal genes plus a “Roundup Ready” gene that makes the plant resistant to the herbicide glyphosate.ⁱⁱ

Monsanto stated it would initially target the new seeds at 250,000 acres of sweet corn.ⁱⁱⁱ Press reports indicate the new sweet corn began entering stores in 2012.^{iv} Our investigation aimed to determine the extent to which this GMO sweet corn had penetrated the U.S. consumer market by the 2013 corn-eating season.

Testing Methodology

Between June and September of 2013, Friends of the Earth worked with volunteers to gather fresh, frozen and canned sweet corn samples from seven states and the

District of Columbia. Volunteers purchased non-organic corn at major retailers and farmers markets, taking precautions to avoid sample contamination (using gloves and plastic bags to handle corn and keeping samples separate in labeled freezer bags). They shipped the samples frozen, overnight, in insulated packaging so the samples would arrive frozen.

Friends of the Earth tested a total of 71 samples of sweet corn – 54 fresh, eight frozen and nine canned corn samples – from eight areas nationwide, including California, Colorado, Illinois, Massachusetts, Oregon, Vermont, Washington, D.C. and Washington State.

We tested the corn using the EnviroLogix QuickStix Kit for Cry1Ab Corn Leaf and Seed and followed testing protocols provided by the manufacturer.^v This kit is designed to extract and detect the presence of the Cry1Ab Bt endotoxins at the levels typically expressed in genetically modified corn plant tissue. The strip tests provide a highly accurate reading of proteins generated by genetic engineering in both the Monsanto and Syngenta varieties of GMO corn.

Samples that tested positive via this testing method were shipped overnight (sealed in bags, frozen, in insulated packaging) to an accredited laboratory, Genetic ID, to confirm the findings using a PCR-based protocol that tests the actual DNA of the corn. These samples tested positive for the regulator genes 35S promoter and NOS terminator, confirming the corn as genetically engineered. Follow-up tests at Genetic ID detected MON89034 in the positive samples, identifying the corn as Monsanto's Seminis Performance Series™.

Findings (see Table)

Only two out of 71 samples (2.8 percent) of sweet corn tested positive for genetically engineered traits. Both were fresh ears of sweet corn on the cob. These were purchased at Stop & Shop (owned by Ahold USA) in Everett, Massachusetts, and City Market (owned by Kroger) in Breckenridge, Colorado.

While we have limited information about the origins of the corn we tested for this report, we were able to determine that the genetically engineered corn purchased at Stop & Shop in Everett was grown in Ontario, Canada, according to the label on the bulk bin at the store.



The genetically engineered corn purchased at City Market in Breckenridge is of unknown origin. The corn was wrapped in plastic packaging and labeled: King Soopers Yellow Corn, three-count, store code 430, bar code 204426001997.

Conclusion

Data from this investigation provide a snapshot look at the U.S. corn market in the summer of 2013. This is not a definitive study or a statistically relevant sampling; however, the relatively large number of samples tested and additional information gathered during this investigation lead us to draw the following conclusions:

- 1. As of 2013, genetically engineered sweet corn appears to be rare in the U.S. consumer market.** Farmers may be deciding not to plant genetically engineered sweet corn, or they may be waiting to see if retailers and food companies accept it^{vi} and whether states decide to label it. It is also possible that genetically engineered corn is being sold in areas of the country or at retailers that were not included in our study. Our largest regional sample – 25 fresh corn samples purchased at grocery stores and farmers' markets – came from Washington State, a top state for sweet corn production.^{vii}
- 2. It is not possible to predict where genetically engineered sweet corn will show up on the shelves of U.S. stores.** We found genetically engineered sweet corn at Stop & Shop in Everett, Mass. (grown in Ontario, Canada), but less than a mile away at Stop & Shop in Medford, Mass., the corn we tested was not genetically engineered (and grown in western Massachusetts). Corn purchased at Walmart stores in Denver and Seattle was not genetically engineered, even though Walmart has indicated it will carry the corn. It is also worth noting that genetically engineered sweet corn appears to be much more prevalent in Canada. A recent Canadian analysis,^{viii} conducted using a similar strip-testing method as was used in our study, found 15 of 43 samples (35 percent) of corn from four provinces tested positive for genetic engineered traits, including corn sold at roadside stands and farmers' markets. Considering the data from both studies, **it is possible that genetically engineered sweet corn found in U.S. stores is more likely to be coming from Canadian growers.** Further investigation is needed to track genetically engineered corn supplies from farm to market in both countries.
- 3. It is not possible to know if the sweet corn**

at your local supermarket is genetically engineered without going through a complicated, expensive testing project. Friends of the Earth spent over \$2,000 on laboratory analysis, testing kits, shipping and packaging to find two positive samples of genetically engineered sweet corn in the U.S. Obviously it is not possible for the average shopper to conduct such testing. Yet people want to know, and have a right to know, if the sweet corn they are eating has been genetically engineered to contain an insecticide and withstand herbicides. A recent New York Times poll found that 93 percent of Americans want genetically engineered foods to be labeled.^{ix} Labeling is an important and necessary tool for tracking genetically engineered foods in our food supply, especially as DNA-altered foods expand into the fresh produce sections of our markets.

References

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[Unlabelled-GM-Sweet-Corn-in-Canadian-Grocery-Stores-and-Farmers-Markets](#)

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Bt Sweet Corn Testing Project Results

State	Sample	Store	Date Purchased	Origin of Corn	Type	Result	Additional info
California	Sample 1CA	Berkeley Bowl, Berkeley, CA	6/26/2013	CA	fresh	N	
California	Sample 2CA	Berkeley Bowl, Berkeley, CA	6/26/2013	CA	fresh	N	
California	Sample 3CA	Safeway, Berkeley, CA	7/1/2013	CA	fresh	N	
California	Sample 4CA	Andronico's, Berkeley, CA (frozen, Birdseye Steamfresh)	9/15/2013		frozen	N	
California	Sample 5CA	Safeway, Berkeley, CA (Safeway kitchens whole kernel corn)	9/15/2013		canned	N	
California	Sample 6CA	Safeway, Berkeley, CA (Safeway kitchens natural corn on the cob)	9/15/2013		frozen	N	
California	Sample 7CA	Safeway, Berkeley, CA (Safeway kitchens mini corn on the cob)	9/15/2013		frozen	N	
California	Sample 8CA	Safeway, Berkeley, CA (Green Giant Nibblers mini corn on the cob)	9/15/2013		frozen	N	
California	Sample 9CA	Safeway, Berkeley, CA (Birdseye Steamfresh)	9/15/2013		frozen	N	
California	Sample 10CA	Safeway, Berkeley, CA (Pantry essentials cut corn)	9/15/2013		canned	N	
California	Sample 11CA	Safeway, Berkeley, CA (Del Monte Fresh Cut Whole Kernel Corn canned)	9/15/2013		canned	N	
California	Sample 12CA	Andronico's, Berkeley, CA (whole kernel corn no salt canned)	9/15/2013		canned	N	
California	Sample 13CA	Safeway, Berkeley, CA (Safeway Kitchens Whole kernel sweet corn canned)	9/15/2013		canned	N	
California	Sample 14CA	Andronico's, Berkeley, CA (S&W sweet Kernel Corn canned)	9/15/2013		canned	N	
California	Sample 15CA	Berkeley Bowl, Berkeley, CA	8/13/2013		fresh	N	
California	Sample 16CA	Berkeley Bowl, Berkeley, CA	8/13/2013		fresh	N	
California	Sample 17CA	Andronico's, Berkeley, CA	9/15/2013		fresh	N	

Colorado	Sample 1CO	King Soopers, Denver, CO	7/11/2013		fresh	N	
Colorado	Sample 2CO	Albertsons, Denver, CO	7/14/2013		fresh	N	
Colorado	Sample 3CO	Walmart, Denver, CO	7/14/2013		fresh	N	
Colorado	Sample 4CO	Breckenridge City Market , Breckenridge, CO	7/17/2013	unknown*	fresh	Y	*King Soopers Yellow Corn, three count, Store 430, #4426, bar code 204426001997
Colorado	Sample 5CO	King Soopers, Aurora, CO	7/29/2013		fresh	N	
Colorado	Sample 6CO	Safeway, Aurora, CO	7/29/2013		fresh	N	
Illinois	Sample I1	Jewel/Osco, Evanston, IL	9/7/2013		fresh	N	
Illinois	Sample I2	Trader Joe's, Evanston, IL	9/7/2013		fresh	N	
Illinois	Sample I3	Dominick's, Chicago, IL	9/7/2013		fresh	N	
Illinois	Sample I4	Jewel/Osco, Evanston, IL (everyday essentials corn canned)	9/7/2013		canned	N	
Illinois	sample I5	Jewel/Osco, Evanston, IL (everyday essentials corn)	9/7/2013		canned	N	
Illinois	Sample I6	Dominick's, Evanston, IL (Safeway kitchens canned whole kernel corn)	9/7/2013		canned	N	
Illinois	Sample I7	Dominick's, Evanston, IL (pantry essentials frozen corn)	9/7/2013		frozen	N	
Massachusetts	Sample M1	Stop & Shop, Medford, MA	8/9/2013	Western Mass.	fresh	N	
Massachusetts	Sample M2	Stop & Shop, Medford, MA frozen corn	8/9/2013		frozen	N	
Massachusetts	Sample M 3	Target, Everett, MA Nature's finest tray corn	8/9/2013		fresh	N	
Massachusetts	Sample M4	Target, Everett, MA	8/9/2013		fresh	N	
Massachusetts	Sample M5	Market Basket, Middleton, MA	8/9/2013		frozen	N	
Massachusetts	Sample M6	Market Basket, Middleton, MA	8/9/2013		fresh	N	
Massachusetts	Sample M7	Stop & Shop, Everett, MA	8/9/2013	Ontario, Canada	fresh	Y	From Ontario Canada

Massachusetts	Sample M8	Market Basket, Middleton, MA	8/9/2013		fresh	N	
Massachusetts	Sample M9	McKinnon's, Everett, MA	8/9/2013		fresh	N	
Massachusetts	Sample M10	Hannaford, Saugus, MA	8/9/2013		fresh	N	
Oregon	Sample O1	QFC , Albany, OR	9/2/2013		fresh	N	
Vermont	Sample V1	Shaw's, Wilmington, VT	7/9/2013		fresh	N	
Vermont	Sample V2	Price Chopper, Brattleboro, VT	7/11/2013		fresh	N	
Washington	Sample W1	QFC, Seattle, WA	7/25/2013	CA	fresh	N	
Washington	Sample W2	Safeway, Seattle, WA	7/25/2013		fresh	N	
Washington	Sample W3	Walmart, Seattle, WA	7/25/2013		fresh	N	
Washington	Sample W4	Metropolitan Market, Seattle, WA	9/2/2013		fresh	N	
Washington	Sample W5	Safeway, Olympia, WA	8/21/2013		fresh	N	
Washington	Sample W6	Fred Meyer, Ballard, WA	8/30/2013		fresh	N	
Washington	Sample W7	QFC, Ballard, WA	9/7/2013		fresh	N	
Washington	Sample W8	Metropolitan Market, Seattle, WA	9/2/2013	Pacific Northwest	fresh	N	
Washington	Sample W9	Whole Foods, Roosevelt Seattle, WA	8/21/2013		fresh	N	
Washington	Sample W10	Scher Farms, Stanwood, WA	8/21/2013		fresh	N	
Washington	Sample W11	Safeway Univ. Village, Seattle, WA	9/2/2013		fresh	N	
Washington	Sample W12	Youngest Farm, Seattle, WA	8/22/2013		fresh	N	
Washington	Sample W13	QFC, Seattle, WA	8/27/2013		fresh	N	
Washington	Sample W14	Bautiste Farm, Seattle, WA	8/22/2013		fresh	N	
Washington	Sample W15	Angalo Farm, Seattle, WA	8/22/2013		fresh	N	
Washington	Sample W16	Trader Joe's, Seattle, WA	9/8/2013	CA	fresh	N	
Washington	Sample W17	Safeway, Spokane, WA	8/28/2013	Wapato, WA	fresh	N	
Washington	Sample W18	Parkside Grocery Market, Spokane, WA	8/31/2013	Odessa (Hutterite)	fresh	N	
Washington	Sample W19	Rosauers Supermarket, Browne's Addition, Spokane, WA	8/31/2013	Spokane (Greenbluff)	fresh	N	
Washington	Sample W20	Spokane Public Market, Spokane, WA	8/31/2013	Hermiston, OR	fresh	N	
Washington	Sample W21	Spokane Farmers Market, Spokane, WA	8/31/2013	Wapato, WA	fresh	N	

Washington	Sample W22	Safeway, Cle Elum, WA	9/2/2013	Wapato, WA	fresh	N	
Washington	Sample W23	Red Sky Orchard, Elk Heights, WA	9/2/2013	Yakima	fresh	N	
Washington	Sample W24	Thorpe Fruit Barn, Thorpe, WA	9/2/2013	Wapato, WA	fresh	N	
Washington	Sample W25	Super 1 Foods, Ellensburg, WA	9/2/2013	Yakima Valley	fresh	N	
Washington DC	Sample DC1	Whole Foods, Washington, DC	7/11/2013		fresh	N	
Washington DC	Sample DC2	Giant, Washington, DC	7/17/2013		fresh	N	
Washington DC	Sample DC3	Target, Washington, DC	7/17/2013		fresh	N	

Results Summary

Total samples tested: 71

Negative non-GMO: 69

Positive GMO: 2

Regional results

California: 17 samples – negative (Northern California Bay Area)

Colorado: 6 samples -- 1 positive (Denver and mountain area)

Illinois: 7 samples – negative (Chicago area)

Massachusetts: 10 samples – 1 positive (Boston area)

Oregon: 1 sample -- negative

Vermont: 2 samples – negative

Washington State: 25 samples – negative (Eastern and Western Washington)

Washington DC: 3 samples – negative

Type of corn

Fresh corn: 54 samples -- 2 positive

Frozen corn: 8 samples – negative

Canned corn: 9 samples – negative