Blowing in the Wind

The road to extinction for Vermont's organic farms: Testing confirms genetic pollution of organically grown corn

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VPIRG
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Vermont Public Interest Research Group
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Executive summary

Genetic testing during the fall of 2003 by VPIRG of corn grown in accordance with organic standards and corn grown conventionally found organically grown corn was contaminated with pollen from nearby genetically engineered corn. VPIRG collected corn from 12 farms in Vermont and had the kernels analyzed for genetic contamination by the Illinois Crop Improvement Association laboratory in Champaign, Illinois.

Results: One of the samples tested was positive for contamination for the CRY 1AB gene. The presence of this gene indicates contamination from Bt corn pollen. The low level detected indicates the contamination resulted from drift rather than contaminated seed. No samples tested positive for presence of GMO corn engineered for Roundup tolerance.

Because pollen from GMO crops such as corn and grass can drift hundreds of yards offsite or miles in the case of insect pollinated crops, the risk of contamination to non-GMO crops increases with every planting. New GMO introductions are on the horizon. These include wind-pollinated pasture and hay grasses engineered to grow low to the ground, and insect-pollinated forage crops such as clover and alfalfa.

What's at stake? Vermont's farmers risk losing their market advantage if GMO contamination becomes widespread. Economic losses to organic and non-GMO conventional farmers are already happening elsewhere in North America. The low level of contamination found suggests that unintentional contamination from GMO crops is a reality in Vermont, discrediting any notion of co-existence between GMO and non-GMO crops, as promoted by the biotech industry.

Rising consumer demand will give GMO-free regions and states the ability to capture the growing global appetite for GMO-free foods. Every Vermont farmer will have an assured future as long as Vermont commits to being GMO-free. A moratorium on the growing of GMO crops is an important first step in regaining the control of our agricultural heritage.

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GMO Issue summary

Genes carry biochemical codes that allow life forms to develop, grow, reproduce and adapt to changing environmental conditions.

Genetic engineering takes snippets of DNA from one organism and crudely inserts them into the genetic code of an unrelated organism. The resulting combinations (genetically modified organisms or GMOs) do not occur in nature: fish engineered with human genes, crop plants engineered with bacterial toxins, soybeans with Brazil nut genes, foods with antibiotic resistance genes.

When genetically engineered plants and animals are released into ecosystems, they carry the potential for self-perpetuating irreversible alteration of Earth's four billion year old genetic legacy.

Testing background

- Laboratory—The Illinois Crop Improvement Association was founded in 1936 to serve as a third party resource to the agriculture industry, primarily to assist in the development, production and certification of seed. In 2002, the lab performed 39,629 seed tests on over 22,000 samples. The Illinois Crop Improvement Association, Inc. 3105 Research Rd. Box 9013 Champaign, Illinois 61826
- Corn samples were collected from 14 farms around Vermont. Two samples had insufficient germination and were not tested. Twelve were analyzed for GMO contamination. Two were from Addison County, two from Orange County, two from Caledonia County, two from Orleans County, and one each from Windham, Washington, Franklin county and Lamoille Counties. The study was set up so all results would be blinded to assure confidentiality. Only participating farmers have access to individual results.
- The 12 farms that were analyzed varied in size from less than 5 acres (4 farms), 10 to 30 acres (7 farms) and one farm over 100 acres. Nine of the farms were organic and three were conventional. Most of the farmers were aware of what crops their neighbors were growing, however a few said the neighbors were unwilling to discuss what they were growing. Of the farmers aware of what the neighbors were growing, four were aware of GMO corn within one-half mile of the sampled fields. All the farmers surveyed felt that GMO contamination is a potential problem.
- Methodology—Samples consisting of ten to twelve ears of mature corn were collected during September and October from nine organic farms and three conventional farms. Corn samples were further dried in mesh bags to prevent molding. Kernels were then stripped from the ears by hand and packaged in numbered bags provided by the laboratory. Upon arrival at the lab, corn seed was germinated and analyzed for presence of two genetic traits: Roundup tolerance and Bt expression.
- Results— One sample (#12) tested positive for CRY 1AB contamination. The corn was grown on a certified organic dairy farm. See test results summary provided by the laboratory (page 12).

Co-existence—a flawed approach

The notion of co-existence has been widely promoted by biotech backers as a way to allow GMO crop use to advance unfettered by regulation. Part of industry's strategy is to shift the burden of providing protections against GMO contamination to those farmers receiving premiums for growing crops organically.

This stands in stark contrast to the European Union's recommendation on agricultural introductions, which states that when a new production type, e.g. GMO crops, are introduced in a region, the farmers who introduce the new production type must bear the responsibility of implementing the farm management measures necessary to limit gene flow.

Over time, contamination spreads through a variety of mechanisms, including self- perpetuation from inadvertently saved contaminated seed, drift of patented genes onto neighboring fields through wind and insect pollination, loss of seeds from poorly covered field-to-farm transport of mature crops, and contamination of non-GMO seeds elsewhere.

The effect is the same: over time, co-existence means 'no existence' for Vermont organic farmers.

Eight reasons why co-existence will be fatal for Vermont organic farmers and farmers choosing to grow non-GMO crops:

1. Use of GMOs can result in GMO contamination of crops grown by Vermont organic farmers and non-GMO conventional growers.

The result of the test of corn grown according to organic standards in Vermont confirms studies elsewhere that the mere presence of GMO corn in the ecosystem results in contamination of non-GMO crops.

2. A uniform set of Accepted Agricultural Practices is unlikely to work in Vermont. Vermont's terrain is highly variable, farm types are interspersed, and market farmers plant sequential varieties to take advantage of Vermont's short growing season. Attempts to isolate GMO crops from non-GMO crops are stopgap measures at best and will in the end be ineffective.

The highly variable nature of the Vermont agricultural landscape, reliable winds, and the wide variety of farming practices existing side by side in Vermont, including sequential planting, make it unlikely that isolation works in any but a small number of cases. The situation grows increasingly worse when new GMO varieties hit the market. GMO clover and alfalfa, pollinated by insects, are coming soon. Creeping bentgrass, a nutritious pasture grass, now engineered to grow low for golf courses, is wind pollinated.

EXAMPLE: Yellow corn near purple popcorn. An Iowa State University project found yellow corn planted near purple popcorn developed a large number of purple kernels. Purple kernels

were also found in neighboring corn that was planted 19 days earlier as far as 1,600 feet away. A strip of purple popcorn was planted within a 15-acre field of standard yellow corn. Separation distances of 30 to 150 feet were cut out of the yellow corn to represent the range of buffer strips recommended by the biotech industry. The yellow corn near the popcorn developed the largest number of purple kernels, but purple kernels developed in the entire test plot. Sept. 30, 2003 -- CropChoice news http://www.cropchoice.com/leadstry.asp?recid=2092

3. Co-existence is premised on a belief that markets will accept an increasing level of contamination.

The experience of exporters to the European Union is that the market wants a low level, if not zero contamination. As testing by processors and distributors becomes more common, Vermont growers will be cut out of lucrative domestic as well as overseas markets. Many of the largest organic companies also have non-organic 'natural' product lines which are also now being tested to avoid GMO content, and several mainstream food processing companies like Gerber and Frito Lay have pledged to avoid using GMO ingredients.

EXAMPLE: An organic grain processor in Berwick, Ontario refused to purchase organic soya crops that tested positive for GMO contamination. Farmers were forced to sell the crop for half the cost. *Genetically altered strains spread by the wind*. Alex Roslin. Toronto Star. September 30, 2002.

EXAMPLE: A shipment of Wisconsin organic corn was rejected by European purchasers after contamination was detected, costing the grower several hundred thousand dollars. Organic farmers around the U.S. have had to sell organic crops on the open market at a considerable loss after GMO contamination was detected. An example cited was a Minnesota farmer who sold organically raised corn for $1.67 a bushel on the open market, instead of the $4.00 a bushel she sought. *Farmers Fight to Save Organic Crops.* Ben Lilliston. www.progressive.org/0901/lil0901.html

4. The use of GMOs has already led to increased costs for organic and non-GMO farmers.

Both GMO and non-GMO farmers may incur added production costs as a result of GMO contamination, including costs to prevent contamination through land segregation, GMO testing, machinery and vehicle cleaning, as well as costs incurred when contamination occurs, through lost sales, dumped crops, and recall of contaminated crops.

EXAMPLE: A 2001 nationwide survey of organic farmers by the Organic Consumers Association found 17 percent of respondents had GMO testing done on their products. Of those tested, eleven percent found contamination Eight percent indicated their farm incurred costs or losses related to the presence of GMOs. Costs indicated in the survey included: payments for testing of seeds, forage, and farm products; loss of organic sales due to presence of GMOs in products; loss of organic certification due to the presence of GMOs. *USA: First Impacts of GMOs on Organic Farmers are Now Documented.* May 14, Organic Farming Research Foundation. www.ofrf.org.

5. Vermont's organic seed industry cannot survive with even a small measure of GMO contamination.

Vermont has an expanding organic seed industry. Seed crops have become the most profitable product for many small and medium-sized growers. Even a small amount of contamination will doom this industry. Co-existence essentially implies acceptance of contamination in the non-GMO seed supply. The mere presence of GMO varieties may taint efforts to provide GMO-free seed.

6. National Organic Standards insist on non-GMO feed for organic livestock

According to National Organic Standards, farmers raising organic forage for organic dairying and other organic livestock production must be able to provide GMO free crops. Contaminated crops, although grown under organic practices, are not marketable as organic forage. A limited but potentially expanding market exists for Vermont dairy farmers opting to sell their herds due to low milk prices but who may wish to keep their land in production by growing organic feed grains to sell to New England's expanding organic dairy industry. Contamination of their grain crops will preclude sales. Also at issue is the emergence of GMO low growing grass varieties sought after by the golf course industry. Some, such as creeping bentgrass, are native to Vermont pastures and hayfields. GMO clover and alfalfa are pollinated by insects and can also contaminate nearby non-GMO fields.

7. Nationally, farmers are not following the biotech planting rules

A significant percentage of farmers using GMOs are not following federal guidelines to ensure resistance does not develop. This disregard for the guidelines raises the question about the ability of farmers to follow other strict rules, including voluntary Accepted Agricultural Practices related to limiting the spread of GMO pollen. Further, it raises the specter of superweeds and superpests developing because of a lack of refuge areas.

EXAMPLE: New National Agricultural Statistics Service data finds 21 percent of all farms growing Bt corn in ten Midwestern states (19,710 farms) violated EPA's requirement in 2002 by planting refuges smaller than the required 20 percent. Twenty-eight percent of small Bt-corn farms (less than 200 acres of corn) planted no refuge. Nineteen percent of farms growing Bt corn in Iowa, Minnesota and Nebraska (or almost 10,000 farms) violated EPA's requirement in 2002. Thirteen percent of all Bt corn farms (6,600 farms) planted 100 percent of their corn with Bt varieties (i.e. planting no refuge at all) while almost 23 percent of small Bt -corn farms (less than 200 acres of corn) planted 100 percent of their corn with Bt varieties. *Planting Trouble: Are Farmers Squandering BT Corn Technology?* Gregory Jaffe, Director, Biotechnology Project. Center for Science in the Public Interest. June 19, 2003.
http://cspinet.org/new/pdf/bt_corn_report.pdf

8. The proposed European model for co-existence would not work in Vermont

The European Commission's proposal on GMO/organic co-existence, which is being suggested as a model for Vermont by the Secretary of Agriculture, has proven highly controversial throughout Europe, and is based on several assumptions that are not applicable here in Vermont. **Foremost, in Europe, co-existence was preceded by first a moratorium and then mandatory food labeling.** A Danish study, (European Commission press release, March 5, 2003: "GMOs: Commission addresses GM crop coexistence") upon which the parameters for co-existence were based, assumed that no more than 10% of crops would be GMO. (Data supplied from the Vermont Agency of Agriculture indicates 21% of commercial corn seed sold in Vermont in 2002 was genetically modified according to the seed companies' voluntary reporting.) A threshold of 1% contamination is considered acceptable (if Vermont's organic crops, including feed corn, were found to be 1% GMO, our farmers would rapidly begin to lose market access). Information provided to Senate Agriculture Committee, October 14, 2003, by Brian Tokar, Institute for Social Ecology Biotechnology Project 1118 Maple Hill Rd. Plainfield, Vermont 05667 802-454-7138 http://www.nerage.org

Dispelling two myths floated by biotech proponents

MYTH #1: Artificially transferring genes from other species is just like hybridization and plant breeding that has been going on for centuries.
REALITY: Unlike genetic engineering, traditional breeding does not manipulate genes; but rather involves crossing of selected parents of the same or closely related species. In sharp contrast, creation of GMOs involves extracting selected genes from one organism such as an animal, plant, insect, or bacterium and/or viruses or synthesizing copies of the selected genes, and artificially inserting them into another completely different organism such as a food crop.

MYTH #2: Use of genetically modified herbicide- tolerant crops leads to a reduction in the use of herbicides, thus reducing farmer and neighbor exposure to pesticides.
REALITY: Widespread use of crops genetically engineered to tolerate broad spectrum herbicides like Monsanto's Roundup leads to herbicide resistance and increased use of the herbicide. A recent report from the Northwest Science and Environmental Policy Center found that, "herbicide tolerant crops have increased pesticide use an estimated 70 million pounds over the last eight years." The report further warns, "The efficacy of herbicide tolerant technology is now seriously threatened by weed shifts and resistance. Herbicide use and costs are bound to rise for the foreseeable future." The report, titled, *Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Eight Years*, draws on U.S. Department of Agriculture data on pesticide use by crop and state. It is the first comprehensive study of the impacts of all major commercial GMO crops on pesticide use in the United States over the first eight years of commercial use from 1996-2003. http://www.biotech-info.net/highlights.html#technical_papers

What do the National Organic Standards say?

National Organic Program Overview Applicability--Preamble
Subpart B - Applicability
http://www.ams.usda.gov/nop/NOP/standards/ApplicPre.html
"The presence of a detectable residue of a product of excluded methods alone does not necessarily constitute a violation of this regulation. As long as an organic operation has not used excluded methods and takes reasonable steps to avoid contact with the products of excluded methods as detailed in their approved organic system plan, the unintentional presence of the products of excluded methods should not affect the status of an organic product or operation."

The following statement is provided by **the Northeast Organic Farming Association of Vermont**.

"Organic and conventional farmers are both threatened by GE technology through the merging of corporations, loss of varietal selection and sources of seeds. Genetically Modified Organisms are prohibited in organic farming systems. Organic farmers will lose the ability to sell food as organic if the crop is contaminated by genetic drift from GE crops. Because of this, NOFA supports a time out on the planting of GE seeds in Vermont, until we can assess the impacts for both organic and conventional growers."

VPIRG recommendations

- Moratorium—A two years minimum moratorium on the growing of GMO crops is essential to allow policy to catch up with the technology.
- Until a moratorium is in place, institute a registry of GMO users and organic farmers to facilitate protection of organic/non-GMO crops and forage.
- Add a definition of GMO agriculture to Vermont statutes.
- Seed labeling—pass amendments to Vermont's seed labeling law requiring labeling of seeds sold in Vermont containing GMO material and registering GMO seed sales with the Agency of Agriculture.
- Liability legislation—Pass legislation to protect farmers from patent infringement lawsuits from GMO patent holders, and clarify liability for unintentional contamination of non-GMO crops.
- The State of Vermont should develop a mechanism to compensate farmers who suffer monetary losses related to GMO contamination.

What's happening in Great Britain? A lesson for Vermont

Genetically modified crops have never been grown commercially in Great Britain. A moratorium on commercial plantings is in force as is labeling of foods containing GMO ingredients. With this as a backdrop, the British Agriculture and Environment Biotechnology Commission in its new report, *GM Crops? Coexistence and Liability* (11/25/03), examines government policy on co-existence and makes a number of recommendations regarding GMO use in Great Britain:

- Farmers growing GMO crops must follow statutory management protocols to keep contamination to a minimum.
- An introductory period of intensive monitoring and auditing of arrangements, including monitoring of environmental impacts, is essential to see whether successful coexistence is possible.
- If data shows that coexistence is impossible during this introductory period, the Government must ensure that it can halt the growing of GM crops.
- Financial arrangements should be set in place to compensate farmers suffering economic loss as a result of GMO contamination.

http://www.aebc.gov.uk/aebc/coexistence_liability.shtml

GMO Vocabulary

- Genetic engineering-a term referring to gene transfer using recombinant DNA technology to create a new plant or animal or new characteristics that could not have occurred under natural conditions.
- Biotech—relating to the biotechnology industry
- Bt (*Bacillus thuringiensis*)—a poisonous bacterium engineered into a crop such as corn or cotton, which then secretes the bacterial toxin in all cells of the plant. Bt is a widely used natural insecticide approved for use by organic farmers. Artificially inserting the Bt gene into crops is an inappropriate use of Bt.
- GE—Genetic engineering
- GMO—Genetically Modified Organism—although occasionally used to indicate non-genetically engineered hybrids, the common usage is for plants, animals, or bacteria that have been genetically engineered
- Pharm crop—A GMO crop that creates its own pharmaceutical by-products in virtually all parts of the plant
- Transgenics—an industry name for GMO technology
- Co-existence—An industry promoted approach to allowing GMO use to continue side by side with organic and conventional non-GMO agriculture, based on the premise that some amount of contamination is acceptable to consumers.

Resources

Information resources below provided by the Institute for Social Ecology Biotechnology Project Plainfield, Vermont.

Genetic Engineering Action Network (GEAN)
Genetic Eng. Action Network: 11 Ward Street, Suite 200, Somerville,
MA 02143, 617-661-6626, jen@geaction.org
Networks activists and NGOs working to address the widespread consequences of genetic engineering.

The Campaign to Label Genetically Engineered Foods
P.O. Box 55699, Seattle, WA 98155 U.S.A.
425-771-4049, label@thecampaign.org, www.thecampaign.org
National consumer campaign for legislation to label engineered foods.

Genetic Engineering Network
P.O. Box 9656, London N4 4JY U.K.
0181 374 9516, info@genetix.freeserve.co.uk, www.visitweb.com/totnes
Links local activists with national and international campaigns and supports formation of local groups.

Center for Food Safety/International Center for Technology Assessment
310 D Street, NE Washington, DC 20002 U.S.A.
202-547-9359, office@icta.org, www.icta.org
Education and legal interventions to promote full testing and labeling of engineered foods**.**

BioDemocracy Campaign/Organic Consumers Association
860 Highway 61, Little Marais, MN 55614 U.S.A.
218-226 4164 , alliance@mr.net , www.purefood.org
Information and organizing resources on engineered foods and U.S. organic food standards.

National Family Farm Coalition
110 Maryland Ave., N.E., Suite 307, Washington, DC 20002 U.S.A.
202-543-5675, nffc@nffc.net, www.nffc.net
Alliance of grassroots farm, resource conservation, and rural advocacy groups, focusing on the effects of engineered crops on farmers, among other issues.

Institute for Social Ecology
1118 Maple Hill Rd., Plainfield, VT 05667 U.S.A.
802-454-8493, ise@sover.net, ise.rootmedia.org
Activism and educational programs on biotechnology, along with education on ecological politics, philosophy, design and building, rooted in a politics of direct democracy and moral economy.

Friends of the Earth
U.S.: 1025 Vermont Ave. NW, Washington, DC 20005 U.S.A.
877-843-8687, foe@foe.org, www.foe.org /safefood
U.K.: 26-28 Underwood Street, London N1 7JQ
0207 490 1555, info@foe.co.uk, www.foe.org.uk/camps/foodbio/index.htm

U.S. Safe Food, Safer Farms Campaign seeks a ban on Bt crops and a moratorium on the release of genetically engineered organisms into the environment. U.K. Food and Biotechnology Campaign seeks an end to the importation, growing and sale of modified foods.

Alliance for Bio-Integrity
P.O. Box 110, Iowa City, IA 52244 U.S.A.
515-472-5554, info@bio-integrity.org, www.bio-integrity.org
Organizer of lawsuit against FDA's lax regulation of engineered foods.

Northeast Organic Farming Association
411 Sheldon Rd., Barre, MA 01005 U.S.A.
P.O. Box 697, Richmond, VT 05477, 802-434-4122, nofavt@together.net, www.nofavt.org
Assistance and advocacy for organic growers in the Northeastern U.S., including active opposition to genetic engineering in agriculture, local and regional conferences, etc.

California Certified Organic Farmers
1115 Mission St., Santa Cruz, CA 95060, U.S.A.
831-423-2263, www.ccof.org
One of the leading organic farming groups in the U.S.; active on GE issues since the late 1980s.

Genetics Forum
94 White Lion Street, London N1 9PF U.K.
020 7837 9229, geneticsforum@gn.apc.org, www.geneticsforum.org.uk
Policy development, campaigns and publications on genetic engineering from a social, environmental and ethical perspective; publishes bimonthly magazine, SPLICE.

Women's Environmental Network
87 Worship St., London EC2A 2BE U.K.
0171 247 3327, testtube@gn.apc.org, www.gn.apc.org/wen
Information and science-based campaign resources on genetics issues.

Primal Seeds
mail@primalseeds.org, www.primalseeds.org
Web-based campaign to protect biodiversity and support local food security, in response to biopiracy, and corporate control of seeds and food.

Rural Advancement Foundation International Now called the Action Group on Erosion, Technology and Concentration (www.etcgroup.org)
110 Osborne St., Suite 202, Winnipeg MB R3L 1Y5, Canada
204-453-5259, rafi@rafi.org, www.rafi.org
U.S. office: P. O. Box 640, Pittsboro NC 27312, U.S.A., 919-542-1396
Focuses on genetic diversity, intellectual property rights, world food security and human genomics. Ongoing investigation of patents and corporate policies, with detailed communiqués frequently posted to the Internet.

Edmonds Institute
20319-92nd Avenue W., Edmonds, WA 98020 U.S.A.
425-775-5383, beb@igc.org, www.edmonds-institute.org
Research and activism focusing on biosafety, patenting, and technology assessment. Publisher of peer-reviewed *Manual for Assessing the Ecological and Human Health Effects of Genetically Engineered Organisms*.

Union of Concerned Scientists
2 Brattle Square, Cambridge, MA 02238 U.S.A.
617-547-5552, ucs@ucsusa.org, www.ucsusa.org
Studies risks and benefits of genetic engineering and supports sustainable alternatives. Publishes quarterly *FoodWeb* electronic newsletter and ongoing survey of approved engineered crops in the U.S.

Council for Responsible Genetics
5 Upland Road, Suite 3, Cambridge, MA 02140 U.S.A.
617-868-0870, marty@gene-watch.org, www.gene-watch.org
Focuses on patenting, genetic discrimination and food safety; publishes monthly ***GeneWatch*.**

Ag Biotech InfoNet
www.biotech-info.net
Comprehensive Internet resource on biotechnology and genetic engineering in agricultural production and food processing and marketing, developed by Idaho-based crop consultant Charles Benbrook.

Environmental Research Foundation
P.O. Box 5036, Annapolis, MD 21403 U.S.A.
1-888-2RACHEL, erf@rachel.org, www.rachel.org
Weekly updates on environmental toxins, corporate power and genetic engineering.

GeneWatch U.K.
The Courtyard, Whitecross Road, Tideswell, Buxton 5K17 8NY U.K.
01298 871 898, gene-watch@dial.pipex.com, www.genewatch.org
Research and analysis on the science, ethics, risks and regulation of genetic engineering, including corporate database and details of crop trials.

Econexus
P.O. Box 3279, Brighton BN1 1TL U.K.
01273 625 173, info@web-econexus.org, www.web-econexus.org
Science-based screening and analysis of scientific documents and patents to assess the impacts of genetic engineering on the environment, farming, food security, health and medicine.

Genetic Resources Action International (GRAIN)
Girona 25, pral., E-08010 Barcelona, Spain
093 301 1627, grain@bcn.servicom.es, www.grain.org
International research and action against erosion of genetic diversity. Publishes quarterly newsletter, *Seedling*.

Research Foundation for Science, Technology and Ecology
A-60 Hauz Khas, New Delhi, 110016, India
(91) 11 696 8077, vshiva@giasdl01.vsnl.net.in, www.ipsil.com/vshiva/
Research on genetic engineering, biopiracy, globalization and intellectual property, and support for traditional farming communities in rural India.