



CENTER FOR
FOOD SAFETY

TRADE MATTERS—GENETICALLY ENGINEERED (GE) CROPS

U.S. Crops

U.S. Regulatory Regime

U.S. Labeling Initiatives

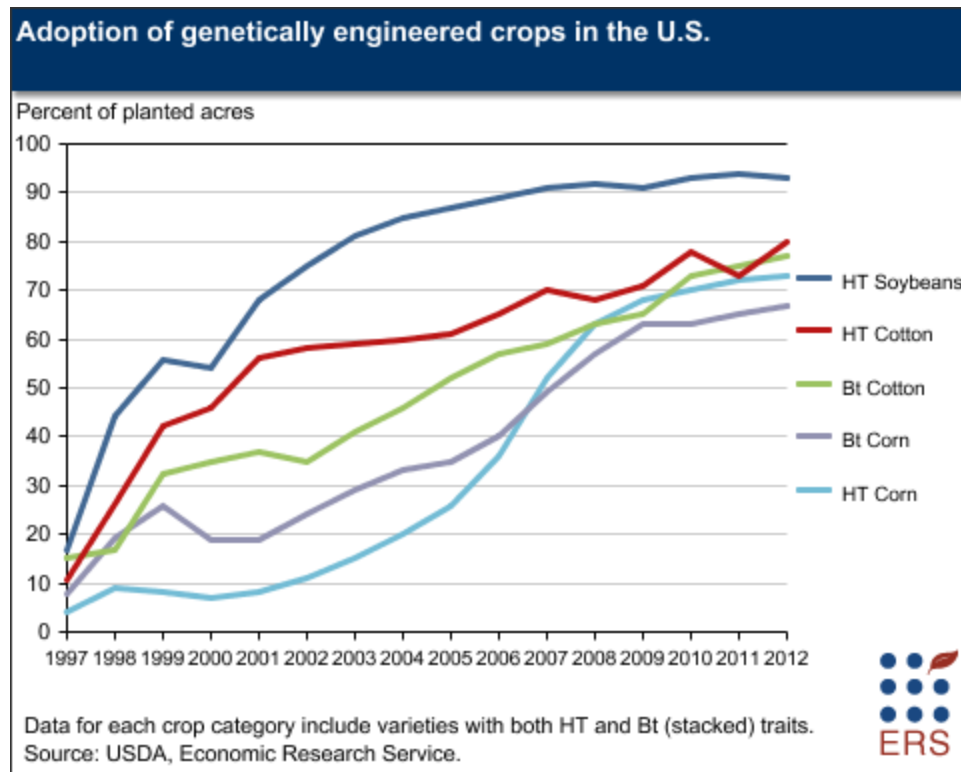
U.S. GE CROPS

- The U.S. grows more GE crops than any other country by a wide margin.
- Approximately 169 million acres (half the total land used to grow crops) of GE corn, cotton, and soybeans were planted in 2013. [1]



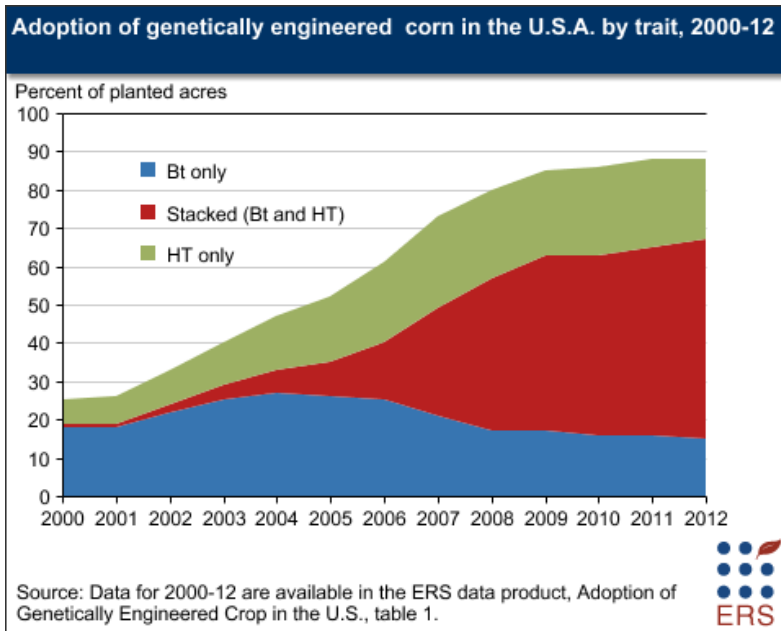
PERCENTAGES OF GE TRAITS IN U.S.

- Herbicide tolerant crops: 94 percent of soy, 72 percent of corn, and 96 percent of cotton
- Bt crops: 65 percent of corn and 75 percent of cotton

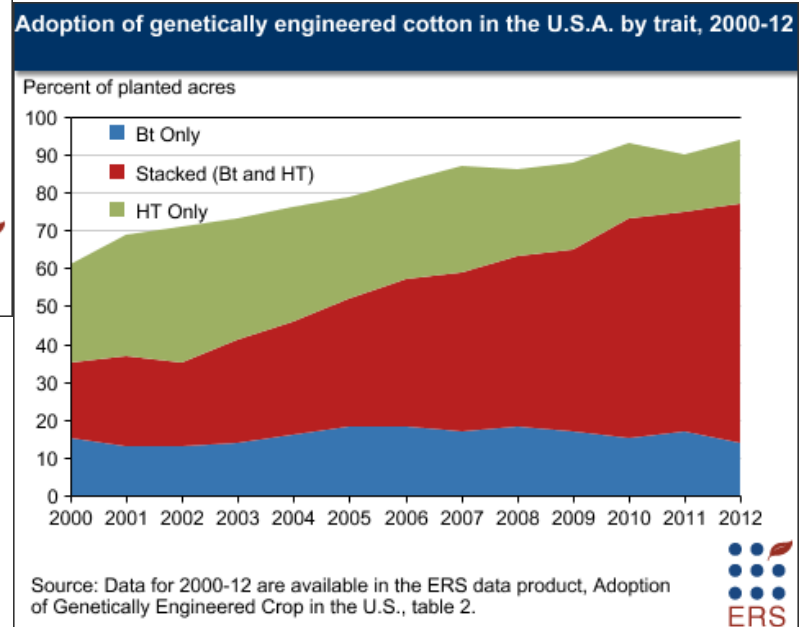


TRAIT TRENDS IN CORN AND COTTON

GE Corn



GE Cotton



PROBLEMS WITH GE CROPS IN THE U.S.

SUPERWEEDS

- Rise of Superweeds: Agronomists are alarmed by the growing epidemic of weeds resistant to glyphosate (Monsanto's Roundup Ready crops). Over 14 glyphosate-resistant weed species have been identified. [2]
- *Farm Industry News* reported in January 2013 that cropland infested with glyphosate-resistant weeds had expanded to 61.2 million acres in 2014. (An increase of 51 percent compared to 2011) [3]



PROBLEMS WITH GE CROPS IN THE U.S.

SUPERWEEDS

- Nearly half of all U.S. farmers interviewed reported that glyphosate-resistant weeds were present on their farm in 2012. [3]
- In 2014 the Texas Department of Agriculture requested that the EPA approve the emergency use of hundreds of thousands of pounds of the hazardous herbicide propazine to kill herbicide-resistant weeds infesting almost three million acres of Texas cotton. (This is about one quarter of total U.S. cotton production.)
 - Propazine is linked to numerous potential and known health threats. Propazine is banned in the EU.



PROBLEMS WITH GE CROPS IN THE U.S. *INCREASED SEED PRICES*

CROP SEED COST (\$/planted acre)	1975	1995	2011	1975-1995 (% increase)	1995-2011 (% increase)
SOYBEANS	\$8.32	\$13.32	\$56.58	60%	325%
CORN	\$9.30	\$23.98	\$86.16	158%	259%
COTTON	\$5.88	\$15.67	\$96.48	166%	516%

Figures from USDA Economic Research Service: Commodity Costs and Returns: U.S. and Regional Cost and Return Data.
Datasets accessible at: <http://www.ers.usda.gov/Data/CostsAndReturns/testpick.htm>.



PROBLEMS WITH GE CROPS IN THE U.S.

INCREASED USE OF PESTICIDES

- More than 26 percent more pesticides per acre were used on GE crops than on non-GE conventional crops in 2008. (USDA) [4]
- Worldwide, around 650,000 tons of glyphosate products were used in 2011 [4], and sales were worth around US\$6.5 billion in 2010 [5], more than the value of all other herbicides combined.
- HR crops have INCREASED overall herbicide use by 572 million pounds. [6]



PROBLEMS WITH GE CROPS IN THE U.S.

CONTAMINATION

- In 2012, nearly nine years after Monsanto ended field trials of GE wheat, a farmer in Oregon discovered the presence of GE wheat in his field.
- Japan and other countries that purchase U.S. wheat temporarily suspended wheat imports until they could be examined for possible contamination. A 2005 study estimated that the wheat industry could lose USD\$94 to \$272 million if GE wheat was introduced (due to loss of sales from countries that do not accept GE wheat). [7]
 - A year since the GE wheat contamination incident, officials still do not know where the GE wheat came from and how it ended up in the farmer's field. Yet, the USDA has approved 22 new GE wheat field trials since the contamination incident.



PROBLEMS WITH GE CROPS IN THE U.S.

OTHER ISSUES

- **Reduced Seed Options:** With corporate consolidation and domination, it is increasingly difficult for farmers to find conventional, non-GE seeds.
- **Reduced Innovation:** Scientists and academics are concerned that seed patents have strangled independent and cooperative research. [8]
- **Loss of Seed Diversity:** Seed and plant varieties have diminished as small local seed breeders have been replaced by large chemical and seed companies promoting monoculture crops. To illustrate, the U.S. has lost 6,000 of 7,000 apple varieties that used to be grown across the nation. [9]



NEXT GENERATION GE CROPS

2,4-D CORN AND SOY

- In response to glyphosate-resistant weed problem, Dow Chemical has submitted a request to commercialize GE corn and soybeans to withstand application of the toxic pesticide 2,4-D. This is the “next generation” GM crops. (Enlist is the brand name.)
- 2, 4-D, a component of “Agent Orange,” the toxic defoliant used in the Vietnam war, has been associated with deadly immune system cancers, Parkinson’s disease, endocrine disruption, and reproductive problems. [10]



NEXT GENERATION GE CROPS

2,4-D CORN AND SOY

- Widespread cultivation of 2,4-D resistant soybeans would trigger a substantial increase in the use of the chemical to over 100 million pounds per year, four times more than current levels. [11]



NEXT GENERATION GE CROPS

DICAMBA CROPS

- The anticipated widespread adoption of MON 87708 would lead to an estimated 50 million lbs. of dicamba applied to soybeans, from just 26,000 pounds at present. [12]
- Epidemiology studies have tentatively linked exposure to dicamba to increased incidence of colon, lung and immune system cancers in pesticide applicators. Other studies have shown that dicamba exposure exhibited a 20 percent inhibition of an enzyme critical to brain function. [12]



U.S. AGENCIES REGULATING BIOTECH PRODUCTS

Six agencies, 14 statutes: United States Department of Agriculture (USDA) (including Animal and Plant Health Inspection Service (APHIS) and Food Safety and Inspection Service (FSIS)), Environmental Protection Agency (EPA), Food and Drug Administration (FDA), National Institute of Health (NIH), National Science Foundation (NSF), Occupational Safety and Health Administration (OSHA)

Subject	Responsible agency(ies)
Foods/Food Additives	FDA, * FSIS. n1
Human Drugs, Medical Devices and Biologics	FDA.
Animal Drugs	FDA.
Animal Biologics	APHIS.
Other Contained Uses	EPA.
Plants and Animals	APHIS, * FSIS n1 FDA. n2
Pesticide Microorganisms Released in the Environment All.	EPA, * APHIS. n3
Other Uses (Microorganisms): Intergeneric Combination	EPA, * APHIS. n3
Intragenetic Combination: Pathogenic Source Organism:	
1. Agricultural Use	APHIS.
2. Non-Agricultural use	EPA, * n4 APHIS. n3
No Pathogenic Source Organisms	EPA Report.
Nonengineered Pathogens:	
1. Agricultural Use	APHIS.
2. Non-agricultural Use	EPA, n4 APHIS. n3
Nonengineered Nonpathogens	EPA Report.

*Chart 1, Coordinated Framework, approval of commercial biotechnology products



U.S. LEGISLATIVE REGULATION OF GE FOODS AND CROPS

- The Coordinated Framework for the Regulation of Biotechnology, established in 1986, set federal policy for regulation of GE crops, animals, and products. It gave oversight authority to the U.S. Department of Agriculture (USDA), U.S. Environmental Protection Agency (EPA), and U.S. Food and Drug Administration (FDA).
- The Plant Protection Act (PPA), enacted by Congress in 2000, is federal policy mainly applicable to USDA oversight of GE crops. Another key piece of legislation affecting GE crops is the National Environmental Policy Act (NEPA).
- The Federal Insecticide, Fungicide and Rodenticide Act focuses on pesticide approval more than crop approval; has implications for biotech.

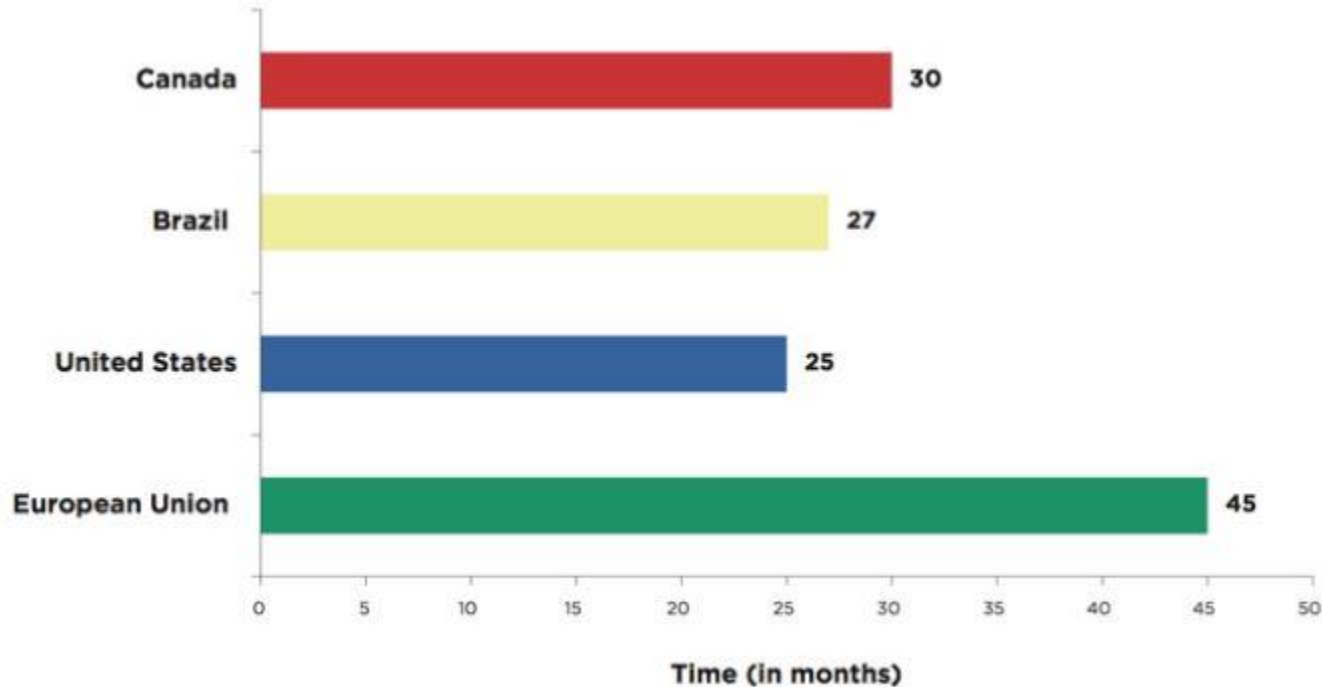


SUMMARY OF U.S. AGENCIES GE OVERSIGHT AUTHORITY

- **U.S. Department of Agriculture (USDA):** Responsible for field trials and for deregulating GE crops (i.e., permitting cultivation and commercialization).
- **Environmental Protection Agency (EPA):** Approves use of and monitors impacts of pesticides. EPA's purview includes evaluating for human health and environmental impacts of pesticides and chemicals. EPA also sets pesticide tolerance levels.
- **Food and Drug Administration (FDA):** Oversees food safety issues, including regulating "food additives," the category the agency has assigned to GE food products. GE animal approval, considered "New Animal Drugs," also falls under FDA oversight. FDA is also responsible for food labeling standards and oversight of GE insects used to control disease on crops.



AVERAGE TIME REQUIRED FOR GE PRODUCT APPROVAL



Data from European Association for Bioindustries (EuropaBio)



SUMMARY OF U.S. GE REGULATORY PROCESS—FIELD TRIALS

- Companies submit notification to APHIS/USDA of intent to conduct a GE crop field trial providing basic information such as the size and location of the field test (this information is kept secret from both neighboring farms and the public).
- APHIS/USDA usually issues an “acknowledgment” within 30 days of notification for “low risk” crops. High risk crops, such as pharma crops which produce chemicals for drugs, must both notify and obtain a permit from USDA.



SUMMARY OF U.S. GE REGULATORY PROCESS—COMMERCIALIZATION

- To commercialize a GE crop, the corporation must petition APHIS/USDA to deregulate its product. The company must submit risk assessment data demonstrating the crop does not pose a plant-pet risk.
- A Review and Comment period follows after the USDA review of the petition. The timeline for the Review and Comment process varies.



SUMMARY OF U.S. GE REGULATORY PROCESS—COMMERCIALIZATION

- In over 15 years of approving GE crops, USDA/APHIS depended almost exclusively on risk-assessment data provided by the company seeking approval and did not perform an Environmental Assessment (EA) or Environmental Impact Statement (EIS).
 - --Successful legal challenges forced the USDA to conduct independent EIAs—in 2007 for alfalfa, and in 2009 for sugar beets.



U.S. AGENCY LACK OF OVERSIGHT

- A 2005 audit conducted by the USDA's Inspector General revealed several cases in which the agency did not know the planting locations of GE field trials, did not require submission of written protocols prior to approvals and more troubling lapses.



LABELING OF GE PRODUCTS

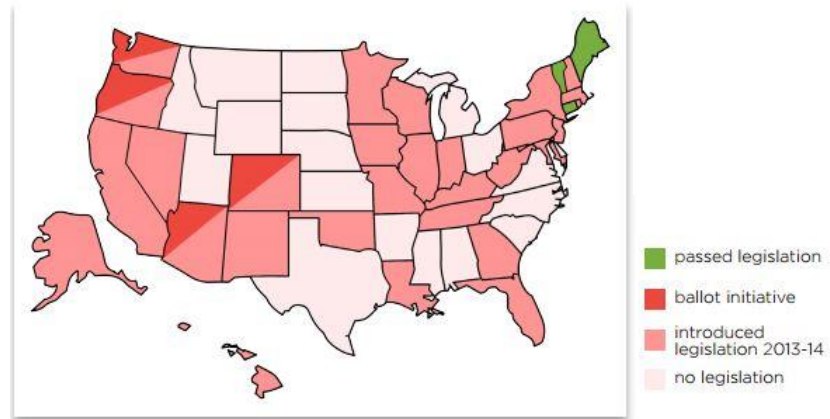
- Although almost 70 percent of all processed foods—from soda to soup, from condiments to crackers— sold in U.S. supermarkets contain genetically modified organisms (GMOs), yet the U.S. requires no labeling of these products. [13]



STATE LABELING – JUNE 2014

ACTIVE STATE LEGISLATION AS OF JUNE 10, 2014

STATE	# BILLS
Georgia	1
Hawaii	1
Illinois	2
Iowa	2
Louisiana	1
Massachusetts	4
Missouri	1
New Hampshire	1
New Jersey	2
New York	5
Oklahoma	1
Pennsylvania	2
Rhode Island	4
STATE	BALLOT
Arizona	✓
Colorado	✓
Oregon	✓
TOTAL STATES	TOTAL LEG.
16	30



TTIP ROLE IN EXPANDING GE CROPS AND ELIMINATING GE LABELING

- U.S. industry and trade officials characterize the EU's application of the precautionary principle for approvals of GE crops as being unscientific or “not based on science.” [15]
- A lobbyist for the U.S. Council for International Business commented that TTIP is only worth doing if “getting rid of the precautionary principle” is achieved. [16]
- National Confectioners Association comments to USTR urged the U.S. to ...”achieve progress in removing mandatory GMO labeling and traceability requirements.” [17] Monsanto, the Biotechnology Industry Association (BIO), and other industry have consistently expressed the desire to roll back GMO labeling requirements.



HISTORY OF TRADE LEGAL CHALLENGES IMPACTING FOOD SAFETY

- A proposed TTIP Investor-State Dispute Settlement (ISDS) mechanism would allow corporations to challenge domestic food safety standards such as labeling.
- Under the WTO dispute system, the U.S. successfully challenged EU policies on delays for approving GE crops, and GE process-based labeling and traceability.
- WTO ruled against U.S. country-of-origin label policy for meat.



SOURCES

- [1] <http://www.ers.usda.gov/publications/err-economic-research-report/err162/report-summary.aspx#.U7K3rvldXKM>
- [2] <http://www.weedscience.org/summary/ResistByActive.aspx>
- [3] “Glyphosate-resistant weed problem extends to more species, more farms,” *Farm Industry News*, January 29, 2013. <http://farmindustrynews.com/herbicides/glyphosate-resistant-weed-problem-extends-more-species-more-farms>
- [4] Charles Benbrook, “Impacts of Genetically Engineered Crops on Pesticide Use in the United States: The First Thirteen Years,” *The Organic Center* (November 2009): 47 & Supplemental Table 7.
- [5] Sansom M (2012) Glyphosate use in the amenity sector. Presentation by Monsanto to the Amenity Forum. Available at www.amenityforum.co.uk
- [6] <https://www.responsibletechnology.org/posts/tag/biotechnology/>
- [7] <http://www.centerforfoodsafety.org/press-releases/3180/one-year-after-ge-wheat-contamination-usda-has-failed-to-protect-farmers>
- [8] <http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx#.U7HgaPldXKM>
- [9] Cary Fowler and Pat Mooney, *Shattering: Food, Politics and the Loss of Genetic Diversity* (Tucson: University of Arizona Press, 1990).
- [10] <http://dow-watch.org/>
- [11] <http://www.centerforfoodsafety.org/files/cfs-science-comments-i.pdf>
- [12] <http://www.centerforfoodsafety.org/files/cfs-science-comments-on-dicamba-use-registration-summary.pdf>
- [13] <http://www.centerforfoodsafety.org/issues/311/ge-foods/about-ge-foods>
- [14] http://www.centerforfoodsafety.org/files/ge-state-labeling-fact-sheet-620141_28179.pdf
- [15] <http://www.iatp.org/files/TPC-TTIP-non-Papers-for-1st-Round-Negotiations-June20-2013.pdf>
- [16] Corporate Europe Observatory. 2013. “Regulation – none of our business?” December 16. Available at: <http://corporateeurope.org/trade/2013/12/regulation-none-our-business>
- [17] [NCA_TTIP_-_US-EU_FTA_submission_-_FINAL_05_10_2013-2.pdf](#)





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