

**Spencer Creek Grange GMO Study Group  
Feb. 1, 2014 Mtg. Report**

Participant	Industry Claim	Pro GMO findings	Anti GMO findings	Sources, dates	Questions?
Steve T.	Crop biotechnology helps small farmers.				
Jeanne T.	Biotech crops can help address the global food crisis.				
Mike G.	Biotech crops spur global economic growth.	<p><b>YES:</b> <b>Conclusion:</b> During the past 16 years, the adoption of crop biotechnology (by 15.4 million farmers in 2011) has delivered important economic benefits. The GM IR traits have mostly delivered higher incomes through improved yields in all countries. Many farmers, especially in developed countries, have also benefited from lower costs of production (less expenditure on insecticides). The gains from GM HT traits have come from a combination of effects. The GM HT technology-driven farm income gains have mostly</p>	<p>..... Over reliance on the use of glyphosate and the lack of crop rotation by some farmers, in some regions, has contributed to the development of weed resistance. As a result, farmers are increasingly adopting a mix of reactive and proactive weed management strategies incorporating a mix of herbicides. This has added cost to the GM HT production systems compared with several years ago, although relative to the conventional alternative, the GM HT technology continues to offer important economic benefits in 2011.</p>	<p>GM Crops and Food: Biotechnology in Agriculture and the Food Chain 4:1, 74-83; January/February/March 2013; © 2013 Landes Bioscience <a href="#">The global income and production effects of genetically modified (GM) crops 1996–2011</a> Graham Brookes* and Peter Barfoot PG Economics Ltd; Dorchester, UK</p>	<p>Mike, did your figures take into account the billions of taxpayers' dollars spent subsidizing these crops the last 20 years? (biofuels, crop insurance, direct payments, etc.?)</p> <p>Here's a great page on the EWG website: ` if \$150 billion has been spent in subsidies on corn, soy, cotton, and livestock in the last 17 yrs.</p>

		<p>arisen from reduced costs of production, though in South America, it facilitated the move away from conventional to low or no-tillage production systems and enabled many farmers to plant a second crop of soybeans after wheat in the same season. Over reliance on the use of glyphosate and the lack of crop rotation by some farmers, in some regions, has contributed to the development of weed resistance. As a result, farmers are increasingly adopting a mix of reactive and proactive weed management strategies incorporating a mix of herbicides. This has added cost to the GM HT production systems compared with several years ago, although relative to the conventional alternative, the GM HT technology continues to offer important economic benefits in 2011.</p> <p>Overall, there is a considerable body of evidence, in peer reviewed literature and summarized in this paper, that quantifies the positive economic impacts of crop biotechnology. <b>The analysis in this paper therefore provides insights into the reasons why so many</b></p>			
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		<p><b>farmers around the world have adopted and continue to use the technology.</b></p> <p>The U.S. Bioeconomy in 2012 reached \$350 billion in revenues, or about 2.5o/o of GOP.</p> <p>By Rob Carlson on January 1, 2014</p> <p>..... In 2012, global planting of <b>GM crops</b> increased by 6%, reaching a total of 170 million hectares. Of the 17 million farmers chose to plant GM crops, more that 15 million were "resource poor farmers in developing countries". In the U.S., where farmers planted 40% of the total GM area, GM corn, cotton, and soy held steady at approximately 90% penetration, with GM sugar beets planted at about the 95% level. Based on average crop revenue figures compiled by the USDA, I estimate that in 2012 the combination of biotech seeds and farm-level revenues reached \$125 billion in the U.S.</p>			
<b>Jennifer R.</b>	Farming using GM crops reduces chemical use.	Yes, GM crops reduce chemical use in the short term, but studies are now showing that insects and weeds are becoming resistant to the	Some weeds and insects have already become resistant to Round-up Ready and Bt GM crops, and now harsher chemicals are	Billitteri, T. J. [editor]. (2012). Genetically modified food. <i>C.Q. Researcher</i>	

		<p>pesticides used with current GMOs. As the patents run out on Round-up ready crops, GM manufacturers are already patenting new GM crops that are resistant to harsher chemicals like 2,4 D. Therefore, in the long term, it seems like this claim may not be true.</p>	<p>needed to control these pests. This resistance may be due to farmers not following manufacturer planting recommendations to leave refuges in which pests can thrive naturally without developing resistance.</p>	<p>22 (30), 717-740.</p> <p>Mannion, A.M. &amp; Morse, S. (2012). <i>Biotechnology in agriculture: Agronomic and environmental considerations and reflections based on 15 years of GM crops. Progress in Physical Geography</i> 36 (6), 747-763.</p>	
<b>Korey R.</b>	Biotech crops increase yields.	<p>Yes, GM crops increase yields due to reduced losses from pests.</p>	<p>Pests are becoming resistant to current GM crops, and as this happens, it follows that yield increases will taper off because losses due to pests will be greater.</p>	<p>Billitteri, T. J. [editor]. (2012). <i>Genetically modified food. C.Q. Researcher</i> 22 (30), 717-740.</p> <p>Mannion, A.M. &amp; Morse, S. (2012). <i>Biotechnology in agriculture: Agronomic and environmental considerations and reflections based on 15 years of GM crops. Progress</i></p>	

				<i>in Physical Geography 36 (6), 747-763.</i>	
<b>Malcolm</b>	Biotech crops help increase income of poorer farmers, reducing poverty and malnutrition.				
<b>Genie H.</b>	Farming with biotech crops is sustainable.	GMO agriculture may not currently use the most toxic of agricultural products. In particular, glyphosate, the most widely used GM herbicide in the world, has a lower toxicity to humans and the environment (EPA Class III) than a number of other herbicides currently in use.	<p>Growers of GM herbicide tolerant crops are being advised to add more herbicides to the mix and some cases to even resort back to ploughing. The amount of herbicide active ingredient applied and number of herbicides used with GM crops has increased, and will continue to increase as weeds become tolerant to each successive, and more toxic, herbicide.</p> <p>However, agriculture is the most polluting industry on earth because of chemical dependence and animal waste from (GMO dependent) factory farming of animals.</p>	<p>PG Economics: Key Environmental impacts of global genetically modified (GM) crop use 1996-2011, Peter Barfoot &amp; Graham Brookes</p> <p>Completely funded by the biotech industry</p>	
<b>Glenn H.</b>	Foods tweaked by biotechnology are safe to eat.	There have been no documented human fatalities attributed to eating GMOs.	Contrary to frequent claims that there is no evidence of dangers to health from GM foods and crops, peer-	Malatesta M, et al. A long-term study on female mice fed on a	

			<p>reviewed studies have found harmful effects on the health of laboratory and livestock animals fed GMOs. These effects include altered nutritional value and toxic and allergenic effects.</p> <p>In a study on human volunteers fed a single GM soybean meal, transgenic DNA survived processing and was detected in the digestive tract. There was evidence of horizontal gene transfer to gut bacteria. Horizontal transfer of transgenic DNA has the potential, among other things, to create new viruses and bacteria that cause diseases and spread drug and antibiotic resistance genes among pathogens.</p> <p>Long-term and multi-generational studies on GMOs are needed to see if the changes found in medium-term studies, which are suggestive of harmful health effects, will develop into serious disease, premature death, or reproductive or developmental effects. Today, such studies are not required by regulators anywhere in the world.</p>	<p>genetically modified soybean: effects on liver ageing. Histochemistry and Cell Biology 2008</p> <p>Gab-Alla A, et al. Morphological and Biochemical Changes in Male Rats Fed on Genetically Modified Corn. Journal of American Science 2012</p> <p>Netherwood T, et al. Assessing the survival of transgenic plant DNA in the human gastrointestinal tract. Nature Biotechnology 2004</p>	
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<b>Elaine C.</b>	Genetically modified foods improve nutrition and health.				Does anyone want to take this one on?
<b>Peggy J.</b>	GM crops and foods complement conventional and organic farming.	<p>Better yield of cleaner (weed &amp; insect free) crop with GM</p> <p>Soil conservation by reducing tillage</p> <p>Water conservation by drought-tolerant traits</p> <p>Opportunity to grow specialized crops for a premium price</p> <p>Ag research supports science-based farming practices</p> <p>Consumer perception of another advantage to purchasing organic</p>	<p><b>GM planting persists in subsequent years, hard to eradicate. Possible costs of seed and chemicals outweigh benefits in yield</b></p> <p><b>Requires stewardship agreements, loss of independence</b></p> <p><b>Specialty markets controlled by seed industry</b></p> <p><b>Patents ending (GM have been grown since 1996) may lead to less control of GM traits</b></p> <p><b>Increase of insect and disease pests when nearby GM makes conventional crop rotation less necessary.</b></p> <p><b>Threats to biodiversity:</b></p> <ul style="list-style-type: none"> <li>- Loss of heritage landraces.</li> <li>- GM traits migrate to saved seed</li> </ul> <p><b>Loss of available farmland near GM cropland</b></p> <p><b>Ag research moves away from organic, lack of science-based study from organic perspective.</b></p> <p>(contamination not USDA concern, WP</p>	<p><a href="http://www.cedla.uva.nl/50_publications/pdf/cuadernos/cuad22.pdf">http://www.cedla.uva.nl/50_publications/pdf/cuadernos/cuad22.pdf</a></p> <p>Maize and Biosecurity in Mexico, Debate and Practice; EDIT ANTAL, LAUREN BAKER AND GERARD VERSCHOOR</p> <p><a href="http://www.abic.ca/abic2013/html/program.html">http://www.abic.ca/abic2013/html/program.html</a></p> <p>Charlie Arnot, CEO of the Center for Food Integrity, Kansas City, MO. PowerPoint presentation can be downloaded at site above. Quoted in Wester</p>	

			<p>9/26/13)  <b>Patents ending (GM have been grown since 1996) may lead to less control of GM traits</b>  <b>Use of shared shipping and storage, maximum GM threshold acceptance, may compromise organic standards.</b></p>	<p>producer from presentation at Agricultural Biotechnology international Conference in Calgary, September 2013:  <a href="http://www.intechopen.com/download/get/type/pdfs/id/29281">http://www.intechopen.com/download/get/type/pdfs/id/29281</a>  Athanasios Theocharopoulos, Stamatis Aggelopoulos, Panoraia Papanagiotou, Katerina Melfou and Evangelos Papanagiotou (2012). Sustainable Farming Systems vs Conventional Agriculture: A Socioeconomic Approach</p>	
<b>Glenn H.</b>	USDA/FDA Oversight -		<b>The regulation of GE products is shared by</b>	Environmental Effects of	



	<p>Enough or too much?</p>		<p><b>FDA, EPA, and USDA, with each agency having enforcement power to regulate certain aspects of biotechnology under respective statutes.</b></p> <p><b>FDA Oversight</b>  The FDA is responsible for regulating the safety of GM crops that are eaten by humans or animals. According to a policy established in 1992, FDA considers most GM crops as "substantially equivalent" to non-GM crops. FDA policy (unchanged since 1992) places responsibility on the producer or manufacturer to assure the safety of the food, explicitly relying on the producer/manufacturer to do so: "Ultimately, it is the responsibility of the producer of a new food to evaluate the safety of the food and assure that the safety requirement of section 402(a)(1) of the act is met." So it is the company, <i>not</i> any independent scientific review, that provides the research that is relied on to assert safety. There is currently no regulatory scheme requiring GM food to be tested to see whether it is safe for humans to eat.</p>	<p>Transgenic Plants: The Scope and Adequacy of Regulation, Washington, DC: National Academy of Sciences Press, 2002</p> <p>Audit Report: Animal and Plant Health Inspection Service</p> <p>Richard Caplan and Skip Spitzer, Regulation of Genetically Engineered Crops and Foods in the United States, p. 2 (2001), available at <a href="http://www.pirg.org/ge/reports/GERegulations.pdf">http://www.pirg.org/ge/reports/GERegulations.pdf</a></p>	
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			<p>Act (FIFRA), the Federal Food Drug and Cosmetic Act (FFDCA), as well as the Toxic Substance Control Act (TSCA). These statutes limit EPA's oversight to only certain genetically modified crops, namely those producing pesticides internally. Registrations of such crops, however, are subject to some of the same shortcomings as registration of conventional pesticides. For example, EPA generally relies on research provided, and often conducted, by the industry applicant, potentially compromising its objectivity. Tainted industry research in pesticide registration has long been a problem.</p> <p>For example, a peer-reviewed report released by EcoStrat, an independent Swiss scientific assessment firm, indicated instances where the EPA accepted inappropriate and scientifically questionable studies in approving the first Bt corn for U.S. growers. In fact, the report states that studies submitted by Novartis and Mycogen to determine the effect of Bt corn on non-target insects were so poorly designed that</p>		
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			<p>there was virtually no chance that adverse effects would be observed.</p> <p><b>USDA Oversight</b> Transgenic, or genetically modified, plants are regulated by USDA's Animal and Plant Health Inspection Service (APHIS) under the Plant Protection Act of 1957 (PPA). A transgenic plant can be regulated by the USDA only if it's determined to be a plant pest or a noxious weed. If a 'plant pest' designated by APHIS is used in the genetic engineering process, then the plant falls under APHIS's regulatory authority. Also, if a plant is considered a noxious weed by APHIS, then its GMO counterpart can be considered a noxious weed. Conversely, if neither condition exists, the plant is deregulated. The PPA does not provide scope for regulatory oversight at the commercialization stage. Therefore, at some point in the regulatory review, the government has to decide that the GMO is not a plant pest. At that stage, when the crop is ready for commercialization, it is exempted from further</p>		
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			<p>regulation. Even with this minimal oversight, to date, the USDA has approved 81 GE crops and 22 applications are pending. It has never denied an application.</p> <p>Two independent scientific assessments have been commissioned to evaluate the efficacy of the USDA oversight process: a 2002 report by the National Research Council of the National Academy of Sciences and an internal USDA Audit Report, published in 2005.</p> <p>The National Academy of Sciences panel concluded that the APHIS review process for GE crops was neither transparent nor scientifically rigorous. NAS experts pointed to a lack of scientific peer review and public input as well as applicants' failure to clearly present their data, methods, analyses and interpretations. APHIS does not rely sufficiently on independent scientific experts, especially in potentially precedent-setting decisions. Companies are allowed to hide vast amounts of data as</p>		
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			<p>Confidential Business Information (CBI); even the NAS Committee was hampered in its review by excessive CBI. In addition, APHIS is chronically understaffed in the area of ecological analysis. Unintended genetic or metabolic effects of the transgene on the host plant go unreported, unless they visibly alter the plant's weediness or fitness.</p> <p>The USDA's own Office of Inspector General (OIG) states that "weaknesses in APHIS regulations and internal management controls increase the risk that regulated genetically engineered organisms will inadvertently persist in the environment before they are deemed safe to grow without regulation," and that "APHIS lacks basic information about the field test sites it approves and is responsible for monitoring, including where and how the crops are being grown, and what becomes of them at the end of the field test."</p> <p>A 2008 GAO Report noted the billions of dollars in economic damages</p>		
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			<p>associated with GE crop contamination events and concluded that "such contamination events are not isolated incidents, as biotechnology proponents argue. Rather the ease with which genetic material from crops can be spread makes future releases likely." The Report called on the USDA "to monitor for other unintended consequences, such as economic impacts on other agricultural sectors, such as organic crops, which may become contaminated by GE crops." The Report further recommended the mandatory monitoring of resistant weeds, with continuing regulatory authority to mitigate impacts should they arise.</p>		
	<p>Patent Law and GMO's - good for the greatest number?</p>				<p>Genie will do this one.</p>