Title

The Political Atmosphere of Genetically Modified Sugar Beet Production

Objective(s)

My goal is to examine how the American sugar beet industry is currently evolving to be more cost-effective and consistent through the use of genetically modified (GM) sugar beets. The scope of this paper has two components. The first component is a discussion of why agribusiness wants to be able to insert GM sugar beets into production and the potential human and environmental effects associated with the modified crop. The other component is an assessment of the political atmosphere of GM sugar beets. In order to assess that atmosphere, this paper identifies the actors that have a stake in the implementation of GM sugar beets and examines who has been most successful asserting their agenda by influencing the political landscape. This will be measured by examining recent litigation as well as the public’s perception of engineered sugar beets and whether their understanding is more grounded in scientific facts or the rhetoric of a particularly involved political actor.

Summary of Findings

Sugar Beet Consumption

In the 19th century, despite the sugar beet’s natural advantage for agricultural production, the beet industry was not competitive with sugar cane in the American marketplace.¹ The industry’s growth relied heavily on government tariffs but as the 20th century progressed, the difference between sugar beets and cane sugar’s market share gradually narrowed and now, fifty-five percent of all American domestic sugar production is provided by sugar beets valued at three

¹ Kipple, 550
billion dollars annually. Although the food industry uses sugar beet sugar and cane sugar interchangeably, the sugar beet’s emergence as the primary crop for American sugar can be attributed to American beet farmers having the lowest cost of beet production of any country in the world. As a result, the typical American consumer encounters sugar from sugar beets in baked goods, jams and fruits, beverages, as well as non-sweet foods such as salad dressings, sauces, condiments, and other tomato and vinegar-based products.

Modern Sugar Consumption

The growth of the American sugar beet industry does not solely stem from being more cost-effective than sugar cane. American’s increased sugar consumption has also contributed to this trend. In 1822, the average American in five days ate the equivalent amount of sugar that a 12-ounce soda can provides now. The typical American consumer today eats this amount of sugar every seven hours. According to a report conducted by the Whole Health Source, in 1999, Americans ate on average about a hundred and seven pounds of sugar.

Demand for a Better Crop

High demand for sugar beets can be credited to more than America’s seemingly insatiable desire for cheap, sugary foods. Sugar beets are now becoming an important crop for biofuel, which is an alternative to fossil fuel energy. To meet this increased demand, advanced biotechnological research was devoted to modifying sugar beets to become a more efficient crop. Historically, sugar beets are a very difficult crop to harvest because they are unusually susceptible to weeds; so much so that unless high-maintenance of weed control is done, yield loses can ranged from fifty percent to a complete loss. In order for conventional weed control to be successful, farmers need to spray multiple herbicides at different times and intervals that make weed control programs complex and hard to manage. Another obstacle for sugar beet yields are viral diseases such as beet necrotic yellow vein virius (BNYVV). This virus causes

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2 More Sugar Facts
3 More Sugar Facts
4 Western Sugar Beet Facts
5 Guyenet, 2012
6 Guyenet, 2012
7 Gurel, 109
rhizomania disease that harms the main root of the sugar beet resulting in significant stunting. This can cause diminished root yield, sucrose content, as well as juice quality.\textsuperscript{8}

The Emergence of the GM Sugar Beet

Using biotechnology, Monsanto successfully developed Roundup Ready sugar beets that have been engineered to withstand large doses of Roundup herbicide, specifically the active ingredient glyphosate. In March of 2005, the United States Department of Agriculture (USDA) gave approval to farmers to use Roundup Ready sugar beets. Wyoming in 2007 became the first state to introduce the engineered crop across twenty-five hundred acres of farmland.\textsuperscript{9} By 2008, Roundup Ready accounted for more than fifty percent of all U.S. sugar beet plantings and according to Richard Powell, a manager of sugar beets at Syngenta Seeds, this number would be significantly larger if “there had been more seed available.”\textsuperscript{10} This dramatic emergence is credited to the effective marketing campaign of the Sugar Industry Biotech Council (SIBC), which is made up of actors involved with every aspect of the sugar beet supply chain. The stated goal of the Council is to provide science-based information explaining the added benefits of GM sugar beets do not compromise the natural sugar quality of ordinary sugar beets.

The Benefits of GM Sugar Beets

When the Roundup Ready sugar beet seeds are planted and combined with Roundup glyphosate herbicide, the genetically engineered crop is capable of dominating all other vegetation, especially weeds. According to beet farmers’ estimations, Roundup Ready sugar beets saves them forty to sixty dollars per acre in labor costs.\textsuperscript{11} The reason for the savings is that Roundup Ready seeds allow farmers to spray the herbicide glyphosate twice during a harvest instead of using a combination of different herbicides five or six separate times. Despite the decreased amount of sprays, farmers in Wyoming advocated for the effectiveness of Roundup Ready over conventional farming techniques in controlling weeds because hand labor was no longer an input cost for their sugar beet production.\textsuperscript{12} This can be attributed to the fact that with Roundup Ready sugar beets, “the timing of the herbicide is not critical in the same way so that

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\textsuperscript{8} Gurel, 115 & \\
\textsuperscript{9} Tasker, 2008 & \\
\textsuperscript{10} Tasker, 2008 & \\
\textsuperscript{11} Dawson, 2011 & \\
\textsuperscript{12} Dawson, 2011 & \\
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people have to crawl around working out whether the weeds have one or two true leaves.”

Because of these benefits, sugar beet farmers consider Roundup Ready sugars beets as being a potentially lucrative enterprise.

Perceived Risks of GM Sugar Beets

The voiced risk regarding the introduction of Roundup Ready sugar beets can be categorized into three separate concerns about genetic biodiversity, gene flow, and food safety. It is understood that conventional agriculture can significantly influence biodiversity. The argument against GM sugar beets is that if there are fewer weeds because of the added strength of the sugar beet then regional birds and wildlife that depend on that habitat will suffer as a consequence. Although this argument still holds water today in the GM sugar beet debate, over twenty ecological risk assessment studies conducted on the issue during the 1990’s and into the 2000’s have concluded that this is not a legitimate concern. In fact, the overarching theme of these reports, according to a paper published in the Journal of Agriculture and Environmental Ethics, is that “the introduction of herbicide resistant sugar beets will most likely decrease herbicide uses and increase biodiversity.” Similarly, scientists have concluded that there is no evidence of a significant gene flow issue where the GM sugar beets cross pollinate with wild sugar beets or conventionally farmed sugar beets and pass on the herbicide resistant gene. Studies conducted in 1993, 1996, 1998 and 2007 all conclude that non-GM vegetation did not acquire an increase in weed resistance that can be associated with a herbicide resistant gene. Likewise for food safety, large numbers of animals tests (Chassy et al., 2004; König et al., 2004; Preston, 2005; Van Eenennaam, 2006) were conducted with genetically modified foods including chemical analysis and animal feeding studies all of which “showed no unintended differences between genetically engineered and conventional varieties in composition, digestibility, or animal health and performance.”

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13 Tasker, 2008
14 Gurel, 120
15 Madsen, 163
16 Madsen, 163
17 Gurel, 115
18 Gurel, 130
Is There a Cause for Concern?

The examination of the science of GM sugar beets begs the question, why are food and environmental NGOs so concerned about Roundup Ready sugar beets? The cause for concern, according to The Center for Food Safety, stems from a labeling issue. According to a 2008 publication, both sugars are combined in products and are not listed separately on labels so that the only way to completely avoid GM sugar is by buying one hundred percent organic which is not feasible for a majority of Americans.\footnote{Food Safety, 2008}

The Legal Fight against Roundup Ready Sugar Beets

Despite the scientific studies, the introduction of Roundup Ready sugar beets is being fought in both the courtroom and through grassroots political campaigning. After the USDA unconditionally approved glyphosate-tolerant sugar beets, The Center for Food Safety, Organic Seed Alliance, Sierra Club, and High Mowing Organic Seed brought a suit against the Secretary of the USDA, Tom Vilsack, in \textit{Center for Food Safety v. Vilsack}. The case was heard in a very liberal California district court that ruled in favor of Food Safety. The judge delivered his opinion that the USDA did not address a possible gene flow issue in their Environmental Impact Statement which is required under the National Environmental Protection Act (NEPA). Judge White articulated that the pollen flow from GM sugar beets may “deprive farmers of their choice not to grow GM crops and consumers of their choice not to consume GM foods.”\footnote{American Society, 1653} Despite the temporary injunction, the USDA used a partial deregulation loophole where the EPA increased allowable levels of herbicide residue so that they could approve Roundup Ready plantings in Wyoming, the Dakotas, and Montana.\footnote{Bell, 2012} Monsanto also made a public a statement arguing that the court ruling will be of no consequence because “the USDA had already allowed so many farmers to plant Roundup Ready sugar beets.”\footnote{Dawson, 2011}

Political Campaigning and the Public’s Perception

Unlike in the legal arena, NGOs are proving more effective at influencing the political landscape through grassroots campaigns. On February 12\textsuperscript{th}, 2009, the Center for Food Safety as well as other food safety, environmental, and corporate watchdog groups launched the Non-
Genetically Modified Beet Sugar Registry. Currently over seventy grocery chains and food producers have signed the registry, which means they pledge to avoid using GM beet sugar in their products as well as fifty-five Congress members who pledged to ask the sugar beet industry and the FDA to not introduce GM beet sugar into the food supply.\textsuperscript{23} Another component of Food Safety’s political campaign is asking supporters of the cause to write to Mars and Hershey’s because they previously pledged to not use GM sugar but have avoided making good on their promise so far.\textsuperscript{24}

Conclusion

Despite the current debate regarding the introduction of GM sugar beets, the Center for Food Safety and other NGO groups have failed to capture the public’s attention with their agenda. In general, U.S. consumers compared to their European counterparts are very uniformed about biotechnology. In a 2007 poll by the International Food Information Council, 68\% of respondents did not know if there were any foods produced through biotechnology that were in the supermarket and only 23\% knew that there were.\textsuperscript{25} In the same survey, 6\% of respondents mentioned genetically modified food as a safety concern while disease worried 38\%. Most importantly for this analysis, 5\% of respondents claimed to have taken any action because of these concerns. Clearly, despite the on going legal and political campaigns, NGO’s have not been able to make this issue salient enough to pressure the USDA and EPA from siding with resource-rich agribusiness. However, there is very recent evidence suggesting that the issue of genetically engineered food in general is gaining traction. In March of 2012, an unprecedented million people submitted a public comment calling for the FDA to require the labeling of genetically engineered food.\textsuperscript{26}

\textsuperscript{23} Bell, 2012

\textsuperscript{24} Dawson, 2011

\textsuperscript{25} Gurel, 130

\textsuperscript{26} Record Breaking, 2012


