WITHERING ON THE VINE:

WILL AGRICULTURAL BIOTECH'S PROMISES BEAR FRUIT?

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"Genetic Engineering will enable farmers to modify crops so that they will grow on land that was previously considered infertile. In addition, it will enable farmers to grow produce with enhanced nutritional value."

White House Proclamation on Biotechnology Week President George W. Bush, May 16, 2001.

Executive Summary

The biotechnology industry and its supporters have long proclaimed all the great things that genetically engineered (GE) crops will do for agriculture, consumers, and the environment in America and around the world. The first generation of products developed and commercialized in the 1990s have, in fact, been commercially successful in the United States and several other countries. Those GE crops – primarily insect-resistant corn and cotton and herbicide-tolerant corn, cotton, soybeans, and canola – have been found safe to humans and the environment. Indeed, they have benefitted the environment and farmers and have been widely adopted by farmers. However, the promise of additional benefits has not been realized. The "second generation" of crops, such as ones engineered to be salt-tolerant or to have enhanced nutritional qualities have still not gotten beyond the laboratory. Is agricultural biotechnology a growth industry with a steady stream of new products or one limited to marketing a few huge-volume commodity crops with narrow agronomic benefits? CSPI analyzed existing publicly available regulatory information to determine whether development of new biotech products has been increasing, decreasing or remaining constant.

CSPI also assessed how long it takes two federal regulatory agencies to complete their review of biotech crops so those products can be commercialized. The U.S. government often touts its regulatory process for biotech crops as being a science-based process and a model for other countries. Although three agencies – the Food and Drug Administration (FDA), the Animal and Plant Health Inspection Service (APHIS) of the US Department of Agriculture (USDA), and the Environmental Protection Agency (EPA) – regulate biotech crops through a patchwork of legal authorities passed by Congress years before genetic engineering existed, the government claims its regulatory process is efficient, effective, and does not hinder product development. Is, in fact, that system efficient and effective? Have product reviews become more routine and faster as the regulatory agencies have become more familiar and comfortable with the technology?

This study analyzed FDA and APHIS information about GE crops that have passed the mandatory or voluntary regulatory hurdles prior to commercialization. The study found that the number of biotech crops going through the regulatory review process decreased sharply between the last five years of the 1990s and the first five years of the 21st century. Furthermore, the products that the government reviewed between 2000 and 2004 were not "novel" because they involved engineering crops with the same or similar genes that were commercialized in the 1990s. Also, while the number of products to be reviewed by federal regulators declined by two-

thirds between 2000 and 2004, the time it took to receive a regulatory clearance doubled. Those unexplained trends should worry those who believe that agricultural biotechnology can be used safely and can benefit farmers, consumers, and the environment in the United States, other developed countries, and in developing countries. Public discourse is needed to understand what factors account for the trends and whether and how they can be reversed.

I. Background

In many ways, the biotechnology industry has been extremely successful. The industry marketed several blockbuster products in the 1990s. Those products include soybeans, corn, cotton, and canola that are herbicide-tolerant and corn and cotton that produce their own pesticide that kills specific pests. Those genetically engineered (GE) crops have been widely adopted by farmers in the U.S. and to varying extent in 17 other countries around the globe. Over 8 million farmers grew 200 million acres of GE crops in 2004. (ISAAA, 2005) From 1996 to 2004, the global acreage of transgenic crops has increased 47 fold, from 4.2 million acres to approximately 200 million acres. (ISAAA, 2005). In the United States, 36.5 million acres of GE corn (45 % of all corn) and 63.5 million acres of GE soybeans (85 % of all soybeans) were grown in 2004. (USDA, 2004).

Those herbicide-tolerant and insect-resistant crops – also called biotechnology's "first generation" – have been found to be safe to humans and the environment in the U.S. They have also provided benefits to farmers and the environment by increasing yields, reducing the use of pesticides, or increasing farmer income.

Although first-generation crops have been extremely successful, for years the biotechnology and food industries and the government have been promising greater and more varied benefits to farmers and consumers throughout the world with their "second generation" of products. For example, in 2000, Hendrik A. Verfaillie, then the President and Chief Executive Officer of Monsanto Company stated that this technology "will enable us to deliver many aspects of health care and disease prevention through our diets....This technology holds tremendous promise for helping farmers in the developing world improve their productivity and economic security....This technology can help us conserve the soil, retain moisture, mitigate the effects of drought, and protect wildlife." (Verfaillie, 2000). Monsanto's Annual Report that year discussed numerous products in the pipeline, including soybeans with an improved amino acid profile for animal nutrition, cold-tolerant corn, drought-tolerant corn, zero-saturated fat soybeans, and corn enhanced with essential amino acids. (Monsanto Annual Report 2000, p. 17). Similarly, Pioneer Hi-Bred, another company involved in agricultural biotechnology, stated on its website in 2000 that the biotechnology products "just around the corner" included soybeans with healthier oil and feed corn with improved digestibility. For products "on down the road," Pioneer identified such applications as drought-tolerant corn, plants as factories, corn that allows increased absorption of iron, and reduced allergenicity in soybeans. (Pioneer Hi-Bred, 2000).

Representatives of the biotechnology industry and the food industry also raised the public's expectations by touting what types of crops were "just around the corner." L. Val Giddings of the Biotechnology Industry Organization testified in Congress in March, 1999 that the public would be seeing in the near future such products as disease-resistant sweet potatoes, cassava, rice, corn, and bananas; soybeans that produce cooking oils with reduced saturated fats; protein-enhanced sweet potato and rice; high vitamin A canola oil; and delayed ripening raspberries, strawberries, and bananas. (Giddings, 1999). The International Food Information

Council, a food-industry group that disseminates information on food, nutrition, and health, stated in a 1999 biotechnology fact sheet that GE foods that "should soon be on the market" include peas grown to remain sweeter, bananas and pineapples with delayed ripening qualities, peanuts with improved protein balance, tomatoes with higher lycopene content, and fruits and vegetables with higher levels of vitamins. (International Food Information Council, 1999). Therefore, it was clear that by 2000, the industry had created high expectations about the products it would deliver in the next few years.

In addition to industry's pronouncements, announcements about the potential for genetic engineering also came from the federal government. For example, when FDA announced its Premarket Notice Concerning Bioengineered Foods in January 2001, it estimated that FDA would receive 20 notices per year about new bioengineered crops. FDA stated:

Since 1994, FDA has received, on average, eight submissions about bioengineered foods that are ready for commercialization per year. However, given the efficiencies of rDNA techniques, the advances in these techniques, and the rapidly expanding information related to genomes, FDA expects that these techniques are likely to be utilized to an increasingly greater extent. Thus, for the purpose of this analysis FDA is estimating that the agency would receive 20 PBN's per year. (FDA, 2001).

FDA also stated that biotechnology is "likely to be utilized to an increasingly greater extent by plant breeders and that products of this technology are likely in some cases to present more complex safety and regulatory issues than seen to date." (FDA, 2001). Thus, FDA believed that GE foods would become more complex and novel and that the number of new GE products would increase in the 21st century.

Thus, by 2000 and 2001, the public was told that agricultural biotechnology would take off in the 21st century, radically changing the crops we grow, benefitting farmers, the environment, and consumers both in the U.S. and throughout the world. Has that promise materialized? The analysis below sheds light on where the biotechnology industry is today and how the federal government's regulatory system has addressed the products as they are ready for commercialization.

II. The Trends in the Development of New Commercial Biotech Crops

CSPI has analyzed publicly available data from federal regulatory agencies to determine whether the number of new commercial products being developed by the agricultural biotechnology industry has been increasing, decreasing or remaining steady. While numerous reports have described a variety of potentially beneficial plants being developed in laboratories and the tremendous growth in the worldwide planting of biotech crops developed in the 1990s, there has been little discussion about industry growth through new commercial products. Data about products submitted to the final review steps at federal agencies provides insight into trends

regarding new product development.¹

CSPI reviewed information about products that have completed the regulatory processes at FDA and USDA.² CSPI assumed that those products reflect the number of new products that could be marketed because the biotechnology industry has emphasized that it will not commercialize a biotech food crop without completing the voluntary consultation process at FDA and obtaining non-regulated status from APHIS (no company has been known to bypass the regulatory process).

According to information on FDA's website, 62 biotech crops completed the voluntary consultation process between 1995 and 2004 (See Figure 1).³ In the first five years (from 1995 through 1999), 47 of those crops (an average of 9.4 per year) completed the regulatory process, while only 15 crops (an average of 3 per year) completed the process in the next five years (2000 to 2004). Thus, the number of products per year completing the regulatory process plunged by 68 % between 1995-1999 and 2000-2004. More than 75% of all biotech crops that have completed the FDA regulatory process did so between 1995 and 1999.

Publicly available data about the granting of petitions for non-regulated status by APHIS show a similar decreasing trend starting in 2000. From 1994 through 2004 (11 years), APHIS deregulated 62 biotech crops so that they could be grown commercially without APHIS oversight. 49 of those approvals occurred between 1994 and 1999 (an average of 8.2 per year) while only 13 of those approvals occurred between 2000 and 2004 (an average of 2.6 per year) (see Figure 2). Thus, APHIS approved almost four times as many crops from 1994 through 1999 than from 2000 to 2004. Clearly, the pipeline for new biotech crops has shrunk considerably,

¹ Numerous reports have analyzed field trials, which have remained fairly constant at approximately 1,000 a year in the US. This report looks at the small subset of crops that have completed field trials and are ready for commercialization.

² Although there are three agencies involved in regulating biotech crops – FDA, USDA, and EPA – CSPI focused its study only on FDA and APHIS because all biotech crops have historically been reviewed under those regulatory agencies before commercialization. Plants engineered to produce a pesticide must be registered by EPA before they can be commercialized but those same plants also need either a permit or non-regulated status from APHIS. Thus, the list of EPA registered biotech crops was not analyzed because it is a subset of the crops in the FDA and APHIS lists.

³ CSPI did not include 1994 data for FDA because the only biotech crop before the agency that year was the Flavor Savr tomato. That product did not complete the normal voluntary consultation process but was instead reviewed under the food additive petition regulatory process. Thus, it was not included in this study.

and few new products have become available for commercialization.⁴

The GE crops that completed the regulatory process starting in 2000 also tend to be variations of existing products with established and proven genes, rather than new, innovative applications of the technology. For example, of the 15 consultations at FDA between 2000 and 2004, five of them involved Monsanto's placing in corn, wheat, creeping bent grass, canola, and sugar beets the same gene for resistance to the herbicide glyphosate (Round Up) that was previously engineered into soybeans and cotton and reviewed by FDA in 1995. Three applications of the 15 involved engineering corn, rice, and cotton with a different gene for herbicide tolerance (the "phophinothricin actyltransferase" or "PAT" gene) that several companies had previously engineered into other crops that completed the FDA consultation process in the 1990s. The remaining seven GE products involved engineering corn and cotton with different Cry genes from the microorganism, *Bacillus thuringiensis*, that confer insect resistance.⁵ Although some of those applications could be considered "new" because they used Cry genes not previously approved to address different plant pests, the Bt technology had been reviewed by FDA in consultations that go back as far as 1995. Therefore, more than half of the few products that went through the final stages of the regulatory process in the past five years used genes identical to ones that were reviewed in the 1990s and the others were varieties using different Bt genes. Industry did not seek to market a single new agronomic, nutritional, or other trait.

In addition, of the 15 new GE products reviewed by FDA starting in 2000, six involved corn, four involved cotton, one involved canola, and one involved sugar beets, all crops that already have a GE variety that had gone through the consultation process. Only three of the submissions involved new crops (rice, wheat, and creeping bentgrass), and, as of the date of this report, none of those varieties had been commercialized.

III. Length of Time to Complete Regulatory Reviews at FDA and APHIS

From information publicly available from FDA and USDA, CSPI calculated the period of time from the official submission of a regulatory package to the final agency decision. For submissions to FDA, the date used for completion of the consultation was the date of the FDA letter to the submitter. For USDA, the completion date was the date when the petition for non-

⁴ Not all products that complete the FDA and/or USDA regulatory processes are commercialized into products. In fact, the majority of biotech crops that have completed those regulatory systems either have not been commercialized or were commercialized for some period of time but are currently not available commercially. It was beyond the scope of this study to determine why certain crops were or were not commercially marketed and successful.

⁵ Some applications included the stacking of Cry genes with herbicide resistance.

regulated status was approved.⁶ The time periods were rounded to the nearest month.

For the 62 voluntary consultation reviews conducted by FDA between 1995 and 2004, the time from official submission to the FDA letter ranged from one month (in 1995) to 35 months (in 1995), with an average of 8.2 months per consultation (see Table 1). For submissions from 1995 through 1999, the average completion time was 6.4 months. However, for submissions from 2000 to 2004, however, the average completion time was 13.9 months. Thus, it took FDA twice as long to review biotech crops from 2000 to 2004 than it did in the 1990s, yet those products had no apparent novel considerations that might justify the longer reviews.

For the 62 petitions for non-regulated status submitted to APHIS between 1994 and 2004, the decision time ranged from one month (in 1995 and 1996) to 29 months (in 1994) with an average of 7.5 months (see Table 2). For submissions from 1994 through 1999, the average completion time was 5.9 months. For submission from 2000 to 2004, however, the average completion time was 13.6 months. Thus, the review time at APHIS more than doubled from the late 1990s to the early 2000s.

IV. Conclusions

Despite glowing pronouncements from the agricultural biotechnology industry, the regulatory data suggests that the industry is stagnating, not thriving. Fewer than three biotech crops a year have made it through the regulatory systems at FDA and USDA over the past five years, which is less than one-third as many products as were reviewed in the second half of the 1990s. Moreover, the recent products that have completed the regulatory review are similar to existing products (such as putting the same herbicide resistance gene in sugar beets, wheat, and canola that already exists in corn and soybeans). Thus, there is little new in the pipeline for farmers or the environment. In fact, ten years after the first product was marketed, there is still no GE crop with a direct consumer benefit. If that trend continues, most of the industry's predicted benefits from agricultural biotechnology may turn out to be hollow promises.

Similarly, while the U.S. government tells the American public and the rest of the world that its regulatory system is fair, efficient, and science-based, in reality that system has become surprisingly slow at making decisions. One would expect that the regulatory pathway for biotech crops in the 21st century would be quicker and easier than in the 1990s for four reasons: (1) regulators have become more experienced with products of this new technology; (2) there has been no evidence of risks from any of the existing products; (3) with fewer products to review, there should be more agency resources for each product; and (4) the new products do not raise novel questions. However, while companies have submitted almost 75 percent fewer products to

⁶ CSPI understands that the times calculated may underestimate the total time for receiving a regulatory clearance because developers and regulators often exchange information well in advance of the formal submission. However, there is no publicly available information that provides details about the time taken by those informal discussions with regulators.

federal agencies, the review time has approximately doubled at both APHIS and FDA. At APHIS, this slower approach has occurred during a time at which APHIS consolidated its resources to regulate GE crops more efficiently and effectively. (USDA, 2002).

V. Recommendations

Based on the data from FDA and APHIS and the conclusions set forth in this report, CSPI recommends:

- 1. The federal government needs to assess and explain to the public why companies and others are marketing fewer new GE crops and why the government is taking longer to come to decisions about their safety. FDA and APHIS need to ensure that all future products receive an efficient review that is proportionate to the potential risks posed by a particular application. GE crops that are not novel and have been engineered with genes already used in previous applications should receive streamlined reviews commensurate with their lower risk so that scarce agency resources could be targeted to novel applications.
- 2. To increase the number of innovative GE crops available to farmers, the federal government needs to streamline its current public investment in genetic engineering research on crops and traits that are not being pursued by the industry and that will benefit farmers, the environment, and also consumers. That research effort should focus on applying current technology (herbicide tolerance and insect-resistance) to non-commodity crops as well as developing the next generation of crops, such as salt-tolerant or nutrient-enhanced products.
- 3. As GE crops are developed by the public sector, the federal government needs to help facilitate the regulatory reviews of those products. Government should increase its public investment in risk assessment research on GE crops and fund the studies needed to gather the necessary safety data for crops that are ready for commercialization.
- 4. To date, the GE crops developed by the industry and grown in the United States and other developed nations are of limited value to farmers in many developing countries. If developing countries are to reap benefits from genetic engineering, the governments of the United States and other developed nations need to increase funding for agricultural research on crops important to developing countries. In addition, the agricultural biotechnology companies should invest a percentage of their profits to fund research that will develop crops beneficial to developing country farmers.
- 5. Although the biotechnology industry is doing little to develop products with the broad societal benefits that would improve public acceptance of GE crops, the industry should take steps to help the public-sector develop such products and

improve consumer acceptance of agricultural biotechnology. The industry should make its proprietary technology freely available for public-sector research in developing nations. Also, the industry should stop opposing, and instead support, sensible biosafety regulation in the United States and abroad. The industry should better police itself and comply with existing laws designed to protect human health and the environment.

It has been ten years since the first GE crops were commercialized, and yet only a small fraction of the potential benefits from this powerful technology have been realized. The trends outlined in this report need to be analyzed and addressed if future benefits are to realized. Only with a regulatory system that is efficient, transparent, and protective of human health and the environment will the public garner the benefits (and be protected from the risks) of GE crops.

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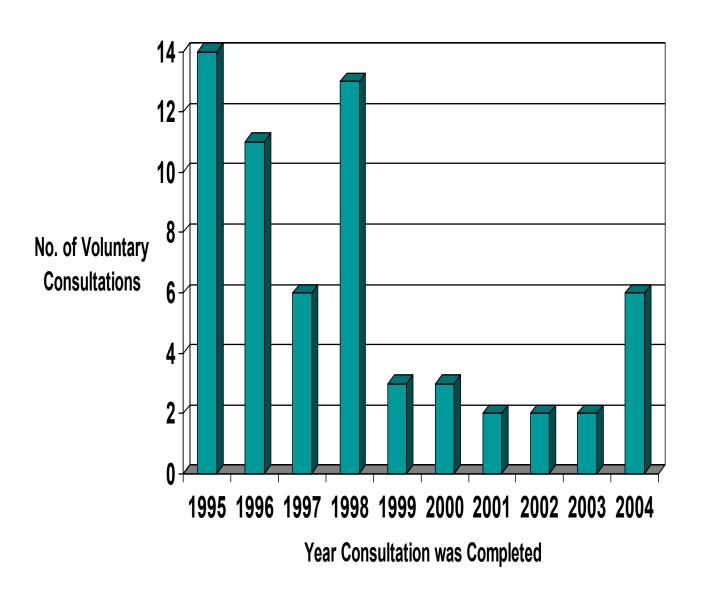
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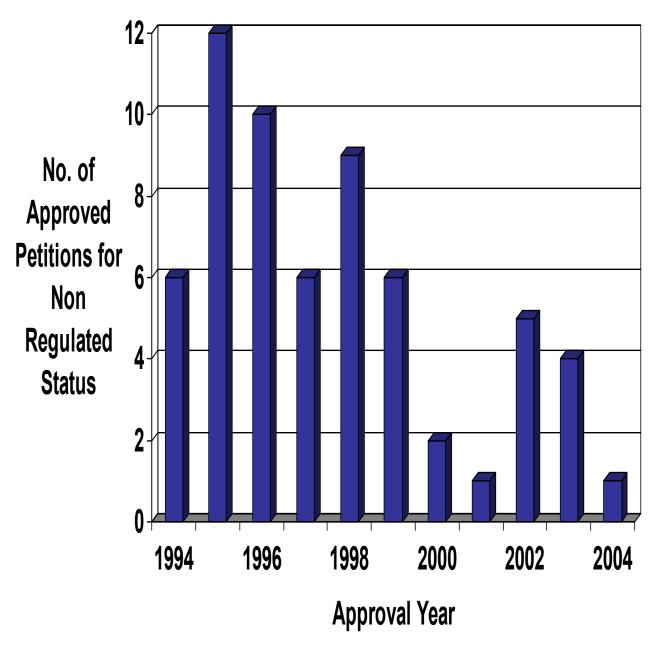
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Figure 1:
Genetically Engineered Crops Completing
FDA's Voluntary Consultation Process



Source: www.cfsan.fda.gov/~lrd/biocon.html

Figure 2:
Genetically Engineered Crop Petitions
Approved by USDA for Non Regulated
Status



Source: http://www.isb.vt.edu/CFDOCS/biopetitions3.cfm

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Table 1 FDA Completed Voluntary Consultations for Biotech Crops (1995-2004)¹

| Year | BNF# ² /Food | Submitted to FDA | FDA Letter of Approval | Time Elapsed |
|------|-------------------------|-------------------|---------------------------|--------------|
| 1995 | #1/ Soybean | September 2, 1994 | January 27, 1995 | 5 months |
| | #2/ Tomato | August 26, 1994 | April 5, 1995 | 8 months |
| | #3/ Tomato | September 6, 1994 | April 5, 1995 | 7 months |
| | #4/ Cotton | June 14, 1994 | April 5, 1995 | 10 months |
| | #5/ Potato | August 25, 1994 | April 5, 1995 | 8 months |
| | #6/ Squash | September 6, 1994 | April 5, 1995 | 7 months |
| | #7/ Tomato | Sept. 16, 1994 | April 5, 1995 | 7 months |
| | #13/ Cotton | Nov. 21, 1994 | June 1, 1995 | 7 months |
| | #20/ Oilseed Rape | April 3, 1995 | Sept. 26, 1995 | 5 months |
| | #23/ Oilseed Rape | March 17, 1995 | April 20, 1995 | 1 month |
| | #24/ Corn | March 2, 1995 | July 14, 1995 | 4 months |
| | #25/ Oilseed Rape | August 17, 1992 | July 13, 1995 | 35 months |
| | #26/ Cotton | April 13, 1995 | September 8, 1995 | 5 months |
| | #29/ Corn | August 29, 1995 | Dec. 14, 1995 | 4 months |
| 1996 | #14/ Tomato | January 16, 1996 | March 20, 1996 | 2 months |
| | #17/ Corn | October 25, 1995 | May 22, 1996 | 7 months |
| | #18/ Corn | Sept. 15, 1995 | July 24, 1996 | 10 months |
| | #28/ Corn | Nov. 17, 1995 | March 8, 1996 | 4 months |
| | #30/ Cotton | February 21, 1996 | June 28, 1996 | 4 months |
| | #31/ Corn | January 12, 1996 | June 7, 1996 | 5 months |
| | #32/ Oilseed Rape | July 6, 1995 | April 4, 1996 | 9 months |
| | #32/ Oilseed Rape | July 6, 1995 | April 4, 1996 | 9 months |
| | #33/ Potato | January 24, 1996 | April 4, 1996 | 3 months |
| | #34/ Corn | June 6, 1996 | Sept. 25, 1996 | 3 months |
| | #35/ Corn | July 2, 1996 | November 5, 1996 | 4 months |
| 1997 | #39/ Soybean | August 28, 1996 | March 14, 1997 | 7 months |
| | #40/ Corn | Sept. 30, 1996 | March 11, 1997 | 6 months |
| | #42/ Papaya | January 3, 1997 | Sept. 19, 1997 | 8 months |
| | #43/ Squash | February 26, 1997 | July 10, 1997 | 5 months |
| | #45/ Radicchio | May 20, 1997 | October 22, 1997 | 5 months |
| | #46/ Canola | May 29, 1997 | August 25, 1997 | 3 months |
| 1998 | #36/ Corn | April 15, 1998 | Dec. 24, 1998 | 8 months |
| | #38/ Sugar beet | June 19, 1998 | October 8, 1998 | 4 months |
| | #41/ Corn | March 3, 1998 | May 29, 1998 | 3 months |
| | #47/ Cotton | Sept. 18, 1997 | January 28, 1998 | 4 months |
| | #48/ Potato | July 21, 1997 | January 8, 1998 | 6 months |
| | #49/ Potato | August 4, 1997 | January 8, 1998 | 5 months |
| | #50/ Flax | October 27, 1997 | May 15, 1998 | 7 months |
| | #51/ Corn | August 20, 1997 | February 13, 1998 | 6 months |
| | #54/ Tomato | Dec. 22, 1997 | February 24, 1998 | 2 months |
| | #55/ Soybean | March 31, 1998 | May 15, 1998 | 2 months |
| | #56/ Sugar beet | June 5, 1998 | November 3, 1998 | 5 months |
| | #57/ Canola | May 29, 1998 | Sept. 16, 1998 | 4 months |

¹ Source: www.cfsan.fda.gov/~lrd/biocon.html ² FDA's file numbering system. BNF is an abbreviation for Biotechnology Notification File.

| | #57/ Canola | May 29, 1998 | Sept. 16, 1998 | 4 months |
|------|----------------------|-------------------|------------------|-----------|
| 1999 | BNF #52/ Canola | Nov. 13, 1997 | July 2, 1999 | 20 months |
| | BNF #60/ Cantaloupe | May 5, 1999 | December 9, 1999 | 7 months |
| | BNF #64/Canola | May 10, 1999 | October 20, 1999 | 5 months |
| 2000 | BNF #63/Rice | Nov. 30, 1999 | August 31, 2000 | 9 months |
| | BNF #66/Corn | June 7, 1999 | April 4, 2000 | 10 months |
| | BNF #71/Corn | February 28, 2000 | October 18, 2000 | 8 months |
| 2001 | BNF #73/Corn | June 28, 2000 | May 18, 2001 | 11 months |
| | BNF #75/Corn | Sept. 25, 2000 | Dec. 31, 2001 | 15 months |
| 2002 | BNF #74/Cotton | June 29, 2000 | July 18, 2002 | 25 months |
| | BNF #77/Oilseed Rape | April 30, 2001 | Sept. 5, 2002 | 17 months |
| | (Canola) | | | |
| 2003 | BNF #79/ Creeping | Sept. 13, 2002 | Sept. 23, 2003 | 12 months |
| | Bentgrass | | | |
| | BNF #86/ Cotton | August 30, 2002 | April 2, 2003 | 8 months |
| 2004 | BNF #80/Wheat | June 28, 2002 | July 22, 2004 | 25 months |
| | BNF #81/Corn | Dec. 11, 2003 | October 4, 2004 | 10 months |
| | BNF #85/Cotton | March 17, 2003 | May 10, 2004 | 14 months |
| | BNF #90/Sugar Beet | April 16, 2003 | August 17, 2004 | 16 months |
| | BNF #92/Cotton | March 18, 2003 | August 3, 2004 | 17 months |
| | BNF #93/Corn | June 30, 2003 | June 30, 2004 | 12 months |

Total Average Number of Months for Consultation from 1995-2004

8.2 months

Average Number of Months for Consultation from 1995-1999

6.4 months

Average Number of Months for Consultation from 2000-2004

13.9 months

Table 2 Genetically Engineered Crop Petitions Approved by USDA for Non Regulated Status (1994-2004)³

| Year | APHIS #/Food | Submitted | Approved | Time Elapsed |
|------|---------------------|-------------------|-------------------|--------------|
| 1994 | 92-204-01/Squash | July 13, 1992 | December 7, 1994 | 29 months |
| | 93-196-01/Cotton | July 15, 1993 | February 15, 1994 | 7 months |
| | 93-258-01/Soybean | Sept. 15, 1993 | May 19, 1994 | 8 months |
| | 94-090-01/Rapeseed | March 31, 1994 | October 31, 1994 | 7 months |
| | 94-227-01/Tomato | August 15, 1994 | October 3, 1994 | 2 months |
| | 94-230-01/Tomato | August 18, 1994 | Nov. 18, 1994 | 3 months |
| 1995 | 94-228-01/Tomato | August 16, 1994 | January 17, 1995 | 5 months |
| | 94-257-01/Potato | Sept. 14, 1994 | March 2, 1995 | 6 months |
| | 94-290-01/Tomato | October 17, 1994 | June 6, 1995 | 8 months |
| | 94-308-01/Cotton | November 4, 1994 | June 22, 1995 | 7 months |
| | 94-319-01/Corn | Nov. 15, 1994 | May 17, 1995 | 6 months |
| | 94-357-01/Corn | Dec. 23, 1994 | June 22, 1995 | 6 months |
| | 95-030-01/Tomato | January 30, 1995 | March 23, 1995 | 2 months |
| | 95-045-01/Cotton | February 14, 1995 | July 11, 1995 | 5 months |
| | 95-053-01/Tomato | Feb. 22, 1995 | Sept. 27, 1995 | 7 months |
| | 95-093-01/Corn | April 3, 1995 | August 22, 1995 | 4 months |
| | 95-145-01/Corn | May 25, 1995 | Dec. 19, 1995 | 7 months |
| | 95-179-01/Tomato | June 28, 1995 | July 28, 1995 | 1 month |
| 1996 | 95-195-01/Corn | July 14, 1995 | January 18, 1996 | 6 months |
| | 95-228-01/Corn | August 16, 1995 | February 22, 1996 | 6 months |
| | 95-256-01/Cotton | Sept. 13, 1995 | January 25, 1996 | 4 months |
| | 95-324-01/Tomato | Nov. 20, 1995 | March 27, 1996 | 4 months |
| | 95-338-01/Potato | December 4, 1995 | May 3, 1996 | 5 months |
| | 95-352-01/Squash | Dec. 18, 1995 | June 14, 1996 | 6 months |
| | 96-017-01/Corn | January 17, 1996 | March 15, 1996 | 2 months |
| | 96-051-01/Papaya | February 20, 1996 | September 5, 1996 | 7 months |
| | 96-068-01/Soybean | March 8, 1996 | July 31, 1996 | 4 months |
| | 96-248-01/Tomato | September 3, 1996 | October 9, 1996 | 1 month |
| 1997 | 96-291-01/Corn | October 17, 1996 | March 28, 1997 | 5 months |
| | 96-317-01/Corn | Nov. 12, 1996 | May 27, 1997 | 6 months |
| | 97-008-01/Soybean | January 8, 1997 | May 7, 1997 | 4 months |
| | 97-013-01/Cotton | January 13, 1997 | April 30, 1997 | 3 months |
| | 97-099-01/Corn | April 9, 1997 | Nov. 18, 1997 | 7 months |
| | 97-148-01/Cichorium | May 28, 1997 | November 7, 1997 | 6 months |
| | Intybus | | | |
| 1998 | 97-204-01/Potato | July 23, 1997 | December 3, 1998 | 17 months |
| | 97-205-01/Rapeseed | July 24, 1997 | January 29, 1998 | 6 months |
| | 97-265-01/Corn | Sept. 22, 1997 | May 8, 1998 | 8 months |
| | 97-287-01/Tomato | October 14, 1997 | March 26, 1998 | 5 months |
| | 97-336-01/Beet | December 2, 1997 | April 28, 1998 | 4 months |
| | 97-342-01/Corn | December 8, 1997 | May 14, 1998 | 5 months |
| | 98-014-01/Soybean | January 14, 1998 | April 30, 1998 | 3 months |
| | 98-173-01/Beet | June 22, 1998 | Dec. 23, 1998 | 6 months |
| | 98-238-01/Soybean | August 26, 1998 | October 14, 1998 | 2 months |

³ Source: www.isb.vt.edu/CFDOCS/biopetitions3.cfm

| 1999 | 98-278-01/Rapeseed | October 5, 1998 | March 22, 1999 | 5 months |
|------|--------------------|-------------------|------------------|-----------|
| | 98-329-01/Rice | Nov. 25, 1998 | April 15, 1999 | 5 months |
| | 97-339-01/Potato | December 5, 1997 | January 25, 1999 | 13 months |
| | 98-216-01/Rapeseed | August 4, 1998 | January 27, 1999 | 5 months |
| | 98-335-01/Flax | December 1, 1998 | May 19, 1999 | 5 months |
| | 98-349-01/Corn | Dec. 15, 1998 | April 22, 1999 | 4 months |
| 2000 | 99-173-01/Potato | June 22, 1999 | July 17, 2000 | 13 months |
| | 00-011-01/Corn | January 11, 2000 | Sept. 29, 2000 | 8 months |
| 2001 | 00-136-01/Corn | May 15, 2000 | June 14, 2001 | 13 months |
| 2002 | 01-206-01/Rapeseed | July 25, 2001 | Dec. 23, 2002 | 17 months |
| | 00-342-01/Cotton | December 7, 2000 | November 5, 2002 | 23 months |
| | 01-121-01/Tobacco | May 1, 2001 | Sept. 16, 2002 | 16 months |
| | 01-137-01/Corn | May 17, 2001 | October 8, 2002 | 17 months |
| | 01-206-02/Rapeseed | July 25, 2001 | Dec. 23, 2002 | 17 months |
| 2003 | 03-036-02/Cotton | February 5, 2003 | July 15, 2003 | 5 months |
| | 01-324-01/Rapeseed | Nov. 20, 2001 | January 2, 2003 | 14 months |
| | 02-042-01/Cotton | February 11, 2002 | March 10, 2003 | 13 months |
| | 03-036-01/Cotton | February 5, 2003 | July 15, 2003 | 5 months |
| 2004 | 03-181-01/Corn | June 30, 2003 | October 21, 2004 | 16 months |

Total Average Number of Months for Consultation from 1994-2004

7.5 months

Average Number of Months for Consultation from 1994-1999

5.9 months

Average Number of Months for Consultation from 2000-2004

13.6 months