

Planting Trouble Update – September 10, 2003.

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On June 19, 2003, the Center for Science in the Public Interest (CSPI) issued “*Planting Trouble: Are Farmers Squandering Bt Corn Technology?*”¹ That report presented data from the United States Department of Agriculture (USDA) that found significant noncompliance by farmers in Iowa (IA), Minnesota (MN) and Nebraska (NE) with the Environmental Protection Agency’s (EPA) refuge requirements for corn engineered with genes from the *Bacillus thuringiensis* (*Bt*) bacterium. To ensure insect susceptibility and to protect the environment, EPA requires *Bt* corn farmers to: (1) plant a 20 percent non-*Bt* corn refuge in the Corn-Belt states, and (2) plant the refuge within one-half mile of the *Bt* corn.

On July 11, 2003, USDA’s National Agricultural Statistics Service (NASS) released its report, “Corn and Biotechnology Special Analysis.”² That report provides additional data relevant to farmer compliance with EPA’s requirement that *Bt* corn farmers plant not more than 80 percent of their corn crop with *Bt* corn varieties. In particular, that report expanded the analysis NASS performed for CSPI in two ways: (1) it provides data on *Bt* corn grown on farms in ten Midwestern states (Illinois, Indiana, IA, Kansas, Michigan, MN, NE, Ohio, South Dakota, and Wisconsin) that represented 77 percent of all US corn and 86 percent of all *Bt* corn planted in 2002; and (2) it provides data on how many acres of *Bt* corn were grown in those states without the required 20 percent refuge. Thus, the new data significantly increase the sample size and provide information on the acres of noncompliant corn.

Consistent with *Planting Trouble*, the new NASS data finds 21 percent of all farms growing *Bt* corn in those ten Midwestern states (or 19,710 farms) violated EPA’s requirement in 2002 by planting refuges smaller than the required 20 percent (Table 1). Individual state compliance rates ranged from 11 percent noncompliance in Indiana to 46 percent noncompliance in Missouri (Table 1).³ In addition, 15 percent of all *Bt* corn farms (14,020) planted 100 percent of their corn with *Bt* varieties (i.e., planting no refuge at all) (Table 1), while almost 28% of small *Bt*-corn farms (less than 200 acres of corn) planted no refuge (Table 2).⁴ Those high

¹ The report can be found at http://www.cspinet.org/new/pdf/bt_corn_report.pdf.

² The NASS report can be found at <http://www.usda.gov/nass/pubs/biocorn.htm>.

³ With one exception (South Dakota), states with more *Bt* corn farms had better compliance rates than states with fewer *Bt* corn farms. In the states with the two worst compliance rates (Missouri and Ohio), only a small percentage of their farms grew *Bt* varieties.

⁴ *Planting Trouble* reported that for IA, MN, and NE, there was 19 percent noncompliance with EPA’s 20 percent refuge requirement and that 13 percent of all farms planted no refuge at all (23 percent for small farms).

noncompliance levels throughout the Midwest strongly suggest that the biotechnology industry's education campaign has been unsuccessful and that other actions (such as inspections and enforcement with penalties) are essential to increasing compliance rates.⁵

The new NASS data also analyzed how much *Bt* corn was grown by farms that did not comply with the refuge requirements. NASS found that 4.2 million acres (or 26 percent) of *Bt* corn was grown without the proper 20 percent refuge, and that 2.5 million of those acres (or 15 percent of *Bt* corn) had no refuge at all (Table 3). In other words, there was approximately 6600 square miles (about two-thirds the size of Maryland) of noncompliant *Bt* corn and approximately 3,900 square miles (about twice the size of Delaware) of *Bt* corn without any refuge. Thus, the NASS data finds a higher percentage of noncompliant acres (26 percent) than farms (21 percent).

In addition, 80 percent of the noncompliant acres (3.3 million) were planted by large corn farms (Table 4). Noncompliance on large corn farms is troublesome because it is likely to lead to large continuous areas without the appropriate refuge, increasing the likelihood of developing resistance.

Finally, the noncompliant *Bt* corn acreage in the different states ranged from a low of 15 percent in Indiana to a high of 56 percent in Ohio (Table 3). Those levels of noncompliant *Bt* corn acres, especially if concentrated geographically, could threaten the long term effectiveness of *Bt* corn products.

Conclusion

The new NASS data confirm that noncompliance with EPA's refuge obligations is rampant throughout Midwestern states. The fact that almost 20,000 farms violated the easier of two refuge obligations should be a wake-up call to EPA that its regulatory system is not working.⁶ In addition, with over four million acres of corn planted in the Midwest without an adequate refuge, there is an increased likelihood that resistant insects will develop. The noncompliant acreage data are alarming because they suggest that there could be 1.8 million three-quarter acre plots of *Bt* corn in the Midwest that are breeding grounds for resistant insects

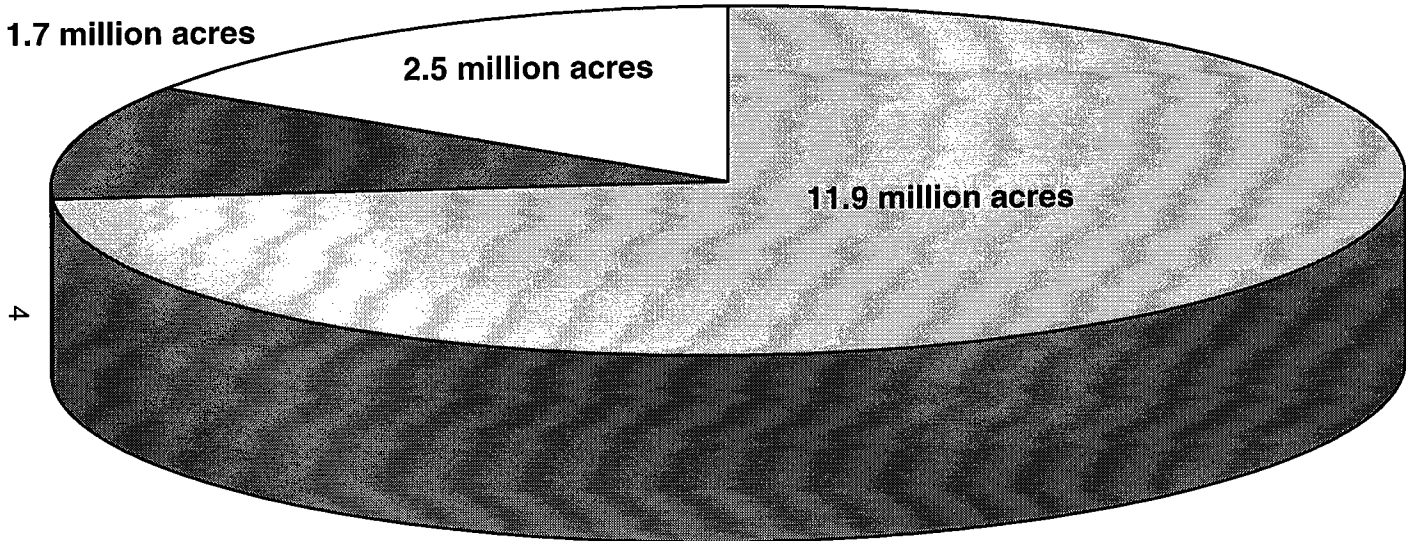
⁵ See *Planting Trouble* for recommendations and actions that EPA and the biotechnology industry should take to assess compliance rates and bring farms into compliance.

⁶ The NASS data only addresses the refuge "size" requirement. For a farm to be in compliance with EPA's refuge requirements, the refuge must also satisfy EPA's "proximity" requirement. Thus, the NASS data underestimates noncompliance since both requirements must be met to have a compliant refuge. There are no NASS data that can determine whether farms with a 20 percent refuge have planted their refuge within a half mile of the *Bt* corn, but it is highly unlikely that the compliance rate with that obligation is 100 percent. The biotechnology industry telephone survey found that there are farms that plant the proper size refuge do not comply with the "proximity" requirement.

because they have no refuge.⁷ Thus, in addition to working to decrease noncompliant acreage, EPA must ensure that there is adequate monitoring for resistance in local areas with high concentrations of *Bt* corn lacking adequate refugia. The new NASS data should spur EPA to rethink how its policies can better achieve its goal – the sustainable and environmentally safe use of *Bt*-corn technology.

⁷ If one divides the noncompliant large farms with no refuge in Table 2 (3,720) into the noncompliant no-refuge large farm acres found in Table 4 (1,813,000), one finds that the average noncompliant farm grew 487 acres of *Bt* corn or about three-quarters of a square mile.

Percentage of Bt Corn on Bt Corn Farms in Selected States (2002) ¹



Total Bt Corn = 16.2 million

¹ States are: IL, IN, IA, KS, MI, MN, NE, OH, SD, and WI

Source: NASS "Corn and Biotechnology Special Analysis" July 11, 2003

- Bt Corn on Farms with 0.1-80.0% Bt Acreage Planted
- Bt Corn on Farms with 80.1-99.9% Bt Acreage Planted
- Bt Corn on Farms with 100% Bt Acreage Planted

Table 1: Percentage of Corn Acreage Devoted to Bt Corn (Among Farms that Planted Bt Corn in 2002)¹²³

State	Farms Planting Bt Corn	Farms with 0.1- 80.0 Percent Bt Acreage Planted		Farms with 80.1 - 99.9 Percent Bt Acreage Planted		Farms with 100 Percent Bt Acreage Planted		Non Compliance with 20% Refuge Requirement	
	Number	Number	Percent	Number	Percent	Number	Percent	Number	Percent
IL	16,310	14,010	86	820	5	1,480	9	2,300	14
IN	3,330	2,960	89	40	1	330	10	370	11
IA	25,030	20,470	82	1,400	6	3,160	13	4,560	18
KS	4,230	2,830	67	390	9	1,010	24	1,400	33
MI	2,650	1,440	54	190	7	1,020	38	1,210	46
MN	12,920	10,560	82	680	5	1,680	13	2,360	18
NE	12,860	9,970	78	1,080	8	1,810	14	2,890	22
OH	2,820	1,760	62	20	1	1,040	37	1,060	38
SD	7,530	5,010	67	950	13	1,570	21	2,520	33
WI	5,850	4,810	82	120	2	920	16	1,040	18
10 Sts	93,530	73,820	79	5,690	6	14,020	15	19,710	21

Source: NASS "Corn and Biotechnology Special Analysis" July 11, 2003.

* Farms not in compliance with EPA 20% refuge requirements are identified in bold face.

Table 2: Large and Small Bt Corn Farms by Percentage of Acres Planted to Bt Varieties, Selected States, 2002¹²³

Acres of Corn Grown on Farm	All Farms Reporting Bt Acreage Planted	Farms with 0.1- 80.0 Percent Bt Acreage Planted		Farms with 80.1 - 99.9 Percent Bt Acreage Planted		Farms with 100 Percent Bt Acreage Planted		Non Compliance with 20% Refuge Requirement	
	Number	Number	Percent	Number	Percent	Number	Percent	Number	Percent
200 or more	56,150	49,060	87	3,370	6	3,720	7	7,090	13
Less than 200	37,380	24,760	66	2,320	6	10,300	28	12,620	34

Source: NASS "Corn and Biotechnology Special Analysis" July 11, 2003.

* Farms not in compliance with EPA 20% refuge requirements are identified in bold face.

¹ Bt corn refers to all varieties which contain the Bt gene including stacked gene varieties.

² Number of farms rounded to the nearest 10. Percents may not add due to rounding.

³ These 10 States have consistent refuge requirements.

Table 3: Bt Corn Acres by Percent of Acres Planted to Bt Varieties, Selected States, 2002 ^{1 2 3}

State	Total Bt Acreage Planted	Bt Acres on Farms with 0.1 - 80.0 Percent Bt Acreage Planted		Bt Acres on Farms with 80.1 - 99.9 Percent Bt Acreage Planted		Bt Acres on Farms with 100 Percent Bt Acreage Planted		Non Compliance with 20% Refuge Requirement	
	1,000 Acres	1,000 Acres	Percent	1,000 Acres	Percent	1,000 Acres	Percent	1,000 Acres	Percent
IL	2,128	1,809	85	166	8	153	7	319	15
IN	378	330	87	4	1	44	12	48	13
IA	4,182	3,196	76	391	9	595	14	986	24
KS	877	580	66	122	14	175	20	297	34
MI	315	167	53	45	14	103	33	148	47
MN	2,376	1,778	75	247	10	351	15	598	25
NE	3,192	2,324	73	419	13	449	14	868	27
OH	192	85	44	3	2	104	54	107	56
SD	1,892	1,224	65	303	16	365	19	668	35
WI	620	448	72	42	7	130	21	172	28
10 Sts	16,152	11,941	74	1,742	11	2,469	15	4211	26

Source: NASS "Corn and Biotechnology Special Analysis" July 11, 2003.

* Farms not in compliance with EPA 20% refuge requirements are identified in bold face.

Table 4: Bt Corn Acres on Large and Small Farms by Percent of Acres Planted to Bt Varieties, Selected States, 2002 ^{1 2 3}

Acres of Corn Grown on Farm	Total Bt Acreage Planted	Bt Acres on Farms with 0.1 - 80.0 Percent Bt Acreage Planted		Bt Acres on Farms with 80.1 - 99.9 Percent Bt Acreage Planted		Bt Acres on Farms with 100 Percent Bt Acreage Planted		Non Compliance with 20% Refuge Requirement	
	1,000 Acres	1,000 Acres	Percent	1,000 Acres	Percent	1,000 Acres	Percent	1,000 Acres	Percent
200 or more	14,147	10,787	76	1,547	11	1,813	13	3,360	24
Less than 200	2,005	1,154	58	195	10	656	33	851	42

Source: NASS "Corn and Biotechnology Special Analysis" July 11, 2003.

* Farms not in compliance with EPA 20% refuge requirements are identified in bold face.

¹ Bt corn refers to all varieties which contain the Bt gene including stacked gene varieties.

² Number of farms rounded to the nearest 10. Percents may not add due to rounding.

³ These 10 States have consistent refuge requirements.