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How GMO Crops Hurt Farmers

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Genetically engineered crops, or genetically modified organisms (GMO), now dominate commodity crop production in the United States. In 2014, GMO varieties made up 93 percent of corn acres, 94 percent of soybean acres and 96 percent of cotton acres planted in the country.[1] With the rise of GMO crops, coexistence between organic, non-GMO and GMO production has become more difficult due to the potential for gene flow and commingling of crops at both the planting and harvesting levels.

In official government jargon, this mixing is referred to as "adventitious presence," but what it means is that GMO crops can contaminate non-GMO and organic crops through cross-pollination on the field or through seed or grain mixing after harvest.[2] Not only does GMO contamination affect seed purity, but it also has serious ramifications for organic and non-GMO farmers that face economic harm due to lost markets or decreased crop values.

Paths of Contamination

Gene flow – Gene flow is a natural process that fosters biological diversity in a plant population by shuffling genetic information from the pollen or seeds of closely related individuals.[3] In crops of the same species, GMO crops can "outcross" or "cross-pollinate" non-GMO crops through wind dispersal or pollinators.[4] Some self-pollinating crops can still be cross-pollinated — like canola, which can outcross with nearby plants up to 55 percent of the time.[5]

Commingling – After a crop is harvested, there are several steps during which GMO and non-GMO seeds or grains can become mixed. This can happen during handling or transport if machinery is not cleaned properly, or due to a quality-control failure or human error during storage or processing.[6]

Farmers Face Economic Loss

The financial burden associated with GMO contamination is significant. Some of the costs to non-GMO and organic farmers include the loss of market access, risks to long-term investments associated with the crop or one type of production, and the expense of putting in place preventative measures to avoid contamination. Preventative measures include creating buffer zones around fields, which can result in reduced crop yield; record-keeping; testing and surveillance of a crop; and segregation, maintenance and cleaning during all steps of the supply chain.

Additionally, consumers who are interested in buying non-GMO foods know that they can rely on organic and non-GMO labeled food products, but the threat of contamination reduces the confidence that consumers have in those products. The undermining of consumer confidence is yet another cost of contamination — or even of just the threat of contamination.

Farmers who intentionally grow GMO crops are not required to plant non-GMO buffer zones to prevent contamination unless this is stipulated in the farm's permit from the U.S. Department of Agriculture (USDA).[7] Yet even the use of buffer zones has proven ineffective because these areas are usually not large enough to prevent contamination.[8]

A Food & Water Watch and Organic Farmers Agency for Relationship Marketing (OFARM) survey of organic farmers found one-third of responding farmers had dealt with GMO contam-

ination on their farm, and the majority of farmers, five out of six, were concerned about GMO contamination. Farmers reported additional costs to their operation from efforts to prevent contamination that are outside their organic certification duties, including delayed planting, more frequent equipment cleaning, buying more expensive seeds and testing their seeds. Once contaminated, farmers report having a median of $4,500 in losses associated with a rejected load of grain.[9]

Organic dairy farmers already face difficulty securing organic feed, and this challenge will only worsen if GMO alfalfa begins to contaminate organic alfalfa.[10] The USDA's approval of Roundup Ready alfalfa in 2010 highlights the significant ramifications that contamination can have for organic producers. Alfalfa is the most important feed crop for dairy cows.[11] Organic dairy farmers receive a price premium for their milk, but they also have production costs of $5 to $7 more per hundred pounds of milk — 38 percent higher than for conventional dairies.[12] If GMO contamination eliminates this premium, which is mostly eaten up by higher organic production costs, these farms could be unprofitable.

Growers of non-GMO and organic sugar beets and related crops — like table beets and chard — also face the possibility of contamination from nearby Roundup Ready sugar beet growers, as well as the potential economic effects associated with a tainted harvest.[13] Over 50 percent of U.S. sugar beet seed production occurs in Oregon's Willamette Valley, also home to about half of the country's swiss chard seed production.[14] The Willamette Valley Specialty Seed Association requires that GMO plants remain three miles from non-GMO chard and beet seed producers, yet sugar beet pollen has been known to travel as far as five miles.[15]

If contaminated, farmers producing non-GMO and organic crops can also lose access to international markets. Many other countries have stricter GMO regulations and labeling requirements than the United States. Despite the advanced U.S. grain-handling system, GMO grains have contaminated non-GMO shipments and devastated U.S. exports.

The Government Accountability Office identified six known unauthorized releases of GMO crops between 2000 and 2008.[16] In 2000, Japan discovered GMO StarLink corn, which was not approved for human food, in 70 percent of tested samples, even though StarLink represented under one percent of U.S. corn cultivation.[17] After the StarLink discovery, the European Union banned all U.S. corn imports, costing U.S. farmers $300 million.[18] In August 2006, unapproved GMO Liberty Link rice was found to have contaminated conventional rice stocks.[19] Japan halted all U.S. rice imports and the EU imposed heavy restrictions, costing the U.S. rice industry $1.2 billion.[20]

Legal Implications of Patented Gene Contamination

Besides the threat of economic harm from contamination, farmers who unintentionally grow patented GMO seeds or who harvest crops that are cross-pollinated with GMO traits could face costly lawsuits by biotechnology firms for "seed piracy." By January 2013, Monsanto had filed 144 patent

infringement lawsuits, recovering as much as $160.6 million from farmers.[21] At least one farmer contends that he was sued when his canola fields were contaminated with GMO crops from neighboring farms.[22]

Recommendations

GMO contamination of non-GMO and organic fields is a growing problem in the United States that will only intensify with the approval of more GMO crops. To help preserve diverse agricultural production methods, biotechnology companies that patent GMO seeds should take responsibility for any financial harm that the presence of their patented technology inflicts upon non-GMO and organic farmers.

Right now, if farmers are harmed by contamination or loss of their markets, it is virtually impossible for them to recover from these damages. The federal government has not dealt with this burden, even as the USDA continues to approve a steady stream of new GMO crops. Congress and state legislatures must address the issue of liability for contamination by GMO crops and require that the costs of GMO contamination be borne by the biotech companies that created the technology and hold the patents on these seeds.

Endnotes

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