



Task Force

GMO Issues Facing Indiana Farmers in 2001

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The global debate over genetically modified organisms, specifically transgenic crop varieties, shows little evidence of quieting down. Whether you favor transgenic plant breeding or not, the short term effects on market acceptance for transgenic crops in general are impacting corn and soybean farmers directly. You only have to look at the uproar caused by the contamination of last year's commercial corn and seed corn production by the Cry9C Bt transgene (approved for animal consumption and industrial use but not human consumption) to realize how quickly the global debate can hit home.

As Indiana farmers prepare for the 2001 growing season, what can they expect? Will there be any more unexpected obstacles regarding the acceptance of currently available transgenic crop varieties? What can farmers do to best minimize the transgenic market risk to their farming operations?

First of all, recognize that NONE of the currently available insect-resistant or herbicide-tolerant corn or soybean varieties are CRITICAL for the success of Indiana farmers.

European corn borer, the corn pest targeted by Bt corn hybrids, occurs infrequently enough and at sufficiently low levels that the use of Bt hybrids is not economical for most Indiana corn growing situations (Hyde et al. 1998). Such hybrids are best suited to extremely early or late corn plantings where the risk of injury from the corn borer is greatest.

The glyphosate tolerant soybean technology is a very handy weed control tool and often lowers total weed control costs, but cannot be considered critically important for the success of soybean production in Indiana. The same holds true for glyphosate tolerant and glufosinate tolerant corn hybrids.

Because these transgenic crop traits are not CRITICAL for the success of Indiana farmers, the choice of whether to grow them or not depends primarily on the farmer's assessment of the uncertainty of market acceptance for such products and/or the available seed supply of alternative non-transgenic varieties.

What if a farmer elects not to use transgenic crop varieties but is concerned about the risk of contamination of his/her grain by transgenic grain? In other words, what are the possible means by which one can end up with transgenic grain interspersed with that produced from a non-transgenic variety?

Seed Supply

Seed producers face the same challenges of producing pure non-transgenic crop seed as do commercial grain producers. Consequently, most have been reluctant to assure 100% "pure" seed relative to transgene contamination.

In late December, the USDA strongly recommended that seed companies sample and test all of their 2001 seed corn lots and all seed parent lines for the presence of the Cry9C Bt transgene because of the hue and cry raised last fall with the discovery of this genetic material in corn flour and products made from corn flour. Any seed lot testing positive for the Cry9C protein is to be channeled by the seed company into feed or non-food industrial use. USDA also recommended that seed companies provide the verification information to customers when they ask for it.

The seed industry has responded to this demand by supposedly testing all seed lots for the presence of the Cry9C Bt transgene. Unfortunately, seed companies cannot *guarantee* zero presence of Cry9C in any seed lot. The currently available quantitative tests, when used

with appropriate sampling intensities, are capable of detecting the presence of the Cry9C protein at the minimum detectable level of no less than about 0.2% with a 99% probability.

Every corn grower needs to take reasonable precautions to avoid introducing the Cry9C Bt transgene into the 2001 corn crop:

(a) At a minimum, corn farmers should “*verify before they buy*” and insist on receiving the results from the USDA-recommended seed testing plan for the Cry9C Bt transgene. Ask for the results in writing, keep this documentation with the seed lot numbers for your records, and help to assure the integrity of the 2001 harvest. Additionally, consider saving a sample of seed (at least 250 grams) from each lot of supposed non-transgenic hybrid or variety for purity retesting in the event that you need to re-verify the non-transgenic integrity of a particular seed lot.

(b) For maximum protection, ask for written assurances for ANY transgene contamination in any non-transgenic corn or soybean variety. Some companies have taken the extra steps to test for any transgene contamination in their non-transgenic hybrid seed lots and are making this information available to their customers.

Previous Crop & Variety

Because of the risk of transgenic volunteer corn, any field planted to a transgenic hybrid in 2000 (especially containing the Cry9C Bt transgene) should not be planted to corn again in 2001. Similarly, be sure to prevent any such volunteer corn in this year’s soybean fields from setting seed.

Planting Operation

Let’s say that a farmer has obtained a “pure” supply of non-transgenic seed corn or soybean but will also be planting some transgenic varieties in 2001. Obviously, then, there will be some potential for seed contamination during the planting operation. The best advice here is to plant the non-transgenic seed lots first, followed by the transgenic varieties. In this way, any seed carrying over from one seed lot to another in the planter will be from non-transgenic to transgenic and not the other way around. In any event,

planter boxes should be run empty and preferably vacuumed out, and metering mechanisms should be thoroughly cleaned every time seed varieties are changed.

Pollen Drift Control

Corn is a cross-pollinating plant species, meaning that pollen freely moves with the wind throughout a cornfield and, to a limited degree, outside of the field during the active pollination period. While recent research on the extent of pollen drift strongly suggests that the majority of corn pollen from a field lands within a very short distance from the field, some small percent of pollen will travel a quarter of a mile or further and still be viable. Consequently, pollen drift represents a means of transgene contamination for farmers growing non-transgenic hybrids adjacent to fields of transgenic hybrids.

Communication with neighbors is an important aspect of pollen drift awareness. Farmers should find out what corn hybrids will be planted adjacent to their fields of non-transgenic corn, and document the hybrid seed lot information and planting dates. In Indiana, the risk of pollen drift is greatest from fields of corn planted to the southwest of the field in question because of the direction of the prevailing winds in mid-summer. Taking the time to note the dates of pollen shed in your field and adjacent fields will help you determine the relative risk of pollen drift.

The risk of pollen drift from neighboring transgenic corn fields may require the harvesting and segregation of a certain amount of corn around the perimeters of a non-transgenic field, certainly no less than 660 feet from the field edge. Corn harvested from those buffer strips should be fed on the farm or channeled to elevators willing to accept transgenic corn.

Harvest Operation

Combines should be thoroughly cleaned prior to the start of grain harvest to minimize the risk of any leftover grain from 2000 in the machine. If non-transgenic and transgenic varieties are grown on the same farm, then the sequence of harvesting those fields should follow the FIF-FOF (First-In-Field, First-Off-Field) principle. This means that non-transgenic varieties planted in the

field first should be harvested before transgenic ones to avoid transgenic grain commingling with non-transgenic grain from the nooks and crannies of the combine.

Handling, Storage & Transport

All grain transport vehicles (trucks, wagons, trailers, grain carts), all grain handling equipment (augers, legs, pits, wet holding bins, dryers), and all grain storage facilities should be thoroughly cleaned prior to the start of grain harvest. By following the FIF-FOF principle during harvesting, the post-harvest operations will benefit because non-transgenic varieties can be received, dried, and transferred to storage ahead of transgenic varieties. Obviously, transgenic and non-transgenic grain should be stored separately on-farm to avoid grain commingling and to take advantage of potential premiums for identity-preserved grains in the market place.

Assuming that transgenic grain was put into storage last, then emptying storage facilities for transport to market should begin with the transgenic grain in order to avoid an extra cleaning step, and also, reduce the chance of contamination. However, given that this strategy will depend on a farmer's marketing plan, all grain transport vehicles and grain handling equipment should be thoroughly cleaned prior to every time that non-transgenic grain load-out follows transgenic load-out in order to avoid commingling of grain left over from the previous handling operation.

In summary, we recommend the following guidelines in order to help Indiana farmers deal with the GMO issue effectively during the 2001 crop season:

Guidelines for Corn, 2001:

- Expect little or no economic benefit from planting approved Bt corn varieties in Indiana.
- Make sure seed corn is certified "clean" for StarLink™ according to the USDA test protocol. Obtain a written verification from the seed company.
- **Avoid** planting glyphosate tolerant corn.
 - Remember that glyphosate tolerant corn hybrids are approved only in the U.S. and

Japan, but not elsewhere around the globe. No quick test kits currently exist for this transgene and no tolerance levels have been established. Even though some grain buyers are assuring farmers that they will purchase grain from these hybrids, farmers bear the sole risk for rejection at the first point of sale should buying policies change at any time in the future.

- Recognize that grain elevators would prefer not to accept any transgenic corn that does not have full approval for the global market place and, subsequently, may change their stance on acceptance of such grain this fall.

—Be aware that Monsanto has established a channeling program for glyphosate tolerant corn. When buying glyphosate tolerant corn seed, farmers commit in writing to market the grain from these hybrids only through approved channels. We urge all farmers to live up to this commitment!

—Approved channels include over 2,000 U.S. elevators that are willing to buy non-EU-approved grains. The American Seed Trade Association maintains an online database of "... grain handling facilities that have indicated a willingness to purchase, receive, and handle genetically enhanced corn products that have full U.S. registration for food and feed use, but are not yet approved for import into the European Union." The Web address for the ASTA database is <http://asta.farmprogress.com/>.

- Recognize that grain processors have urged producers only to plant varieties that have full approval for the global market place and, subsequently, will probably not accept any transgenic corn this fall.

—Be aware that Monsanto, as part of their channeling program, is also establishing a database of every farmer who purchases glyphosate tolerant corn seed. Although they have committed not to reveal names and addresses, they will work with any inquiring processor and reveal to them how many acres of glyphosate tolerant corn

were planted in the regions from where they plan to purchase corn. In any region that a processor raises concern, Monsanto will contact those farmers and remind them to market their corn only through approved channels after harvest. We urge processors to inquire about glyphosate tolerant acres and urge all farmers to comply with the channeling program!

Guidelines for Soybean, 2001:

- Non-transgenic soybean seed supplies are limited.
- Some grain buyers have specialty contracts for non-transgenic soybeans.
- Grain buyers and processors will be buying glyphosate tolerant soybeans.
- Foreign buyers have been buying and **appear** to continue to be willing to buy glyphosate tolerant soybeans (and meal).

References:

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USDA - Grain Inspection, Packers and Stockyards Administration. 2000c. *Sampling and Testing Recommendations for the Detection of Cry9C Protein in Hybrid Seed Corn*. On the Web at: <http://www.usda.gov/gipsa/biotech/starlink/cry9cdetection.htm>

Don't forget, this and other timely information about corn can be viewed at the Chat 'n Chew Café on the World Wide Web at <http://www.kingcorn.org/cafe>. For other information about corn, take a look at the Corn Growers' Guidebook on the World Wide Web at <http://www.kingcorn.org/>. Additional information on grain quality and post-harvest technologies can be found at <http://www.GrainQuality.org>

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Grain Quality Fact Sheets can be accessed on-line through the World Wide Web at: <http://www.agcom.purdue.edu/AgCom/Pubs/grain.htm>

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