More GMO Corn: Increasing Risk Of Crop Contamination?

COLUMBUS, Ohio — With the production of genetically modified corn gradually increasing in Ohio, the risk of contaminating non-GMO corn through pollination is becoming more of a concern.

Peter Thomison, an Ohio State University Extension agronomist, said that growers who produce pure genetic lines or organic grain are at the forefront of the issue of "pollen drift" and should become more familiar with planting practices that prevent contamination by pollen from nearby GMO corn fields.

"It's going to require a lot of coordination among growers to help minimize pollen drift between GMO and non-GMO corn fields," said Thomison, an associate professor in the Department of Horticulture and Crop Science. "Most of the corn growers in Ohio are not too concerned about whether their corn is contaminated because most of the grain elevators will accept GMO corn. It's IP (identity preserved) or organic growers that might be concerned. IP growers represent people using conventional corn products or a GMO crop, but they are trying to grow a crop they can guarantee to an end user is free of GMO events not approved in certain overseas markets. Organic growers, since GMOs are not approved in organic systems, have to prove to the end user that the organic crop is not contaminated."

Roughly 10 percent of the corn grown in Ohio is GMO, ranging from Bt corns that target the European corn borer to herbicide-resistant corn like Roundup Ready to the new Bt corn designed to control rootworms. Since corn reproduces through cross-pollination, a certain percentage of a corn crop is pollinated by neighboring plants.

"Maybe 20 percent to 40 percent of the ovules on that ear of corn may have been pollinated from a neighboring plant, the result due mainly to wind and gravity," said Thomison. "Generally speaking, probably half of the pollen is going to be within the first 12 feet of the corn plants. At 40-50 feet away you are probably looking at around 1 percent of corn to be contaminated."

Thomison said the issue of pollen drift is becoming a growing concern in Ohio, not only with growers looking for pure crops, but also with seed companies and grain elevators where GMO-contaminated seed and grain may not be acceptable.

"Seed companies are concerned for purity reasons. They'll accept seeds that are 99.5 percent hybrid X and 0.5 percent Y, but they usually won't accept contamination levels exceeding 1 percent."

Some grain elevators won't accept GMO corn if a percentage of the grain has been contaminated with a GMO event not approved by the European Union.

"There are varying levels of what's acceptable," said Thomison. "Some grain elevators accept GMO corn regardless of what's in it because it's all going to animal feed, but some grain elevators may decline a Bt corn if it's been contaminated by an event not approved by the EU."

Growers plant corn with up to seven different GMO events, mainly Bt and Roundup Ready events. Less than half of these crops have been approved by the EU for use in Europe.

Thomison offers these recommendations for minimizing pollen drift during planting:

- Using separation or isolation distance to limit exposure of non-GMO cornfields from the pollen of GMO fields.

The potential for cross-pollination decreases as the distance between GMO and non-GMO cornfields increases. Several state seed certification agencies that offer IP grain programs require that non-GMO IP corn be planted at a distance of at least 660 feet from any GMO corn, noted Thomison.

When the isolation distance is less than 660 feet, these IP programs require the use of varying numbers of border rows to ensure that the non-GMO field is "flooded" with non-GMO pollen which will dilute adventitious pollen from a GMO source. These isolation and border row requirements are designed to produce corn grain that is not more than 0.5 percent contaminated with GMOs.

- Coordinating with neighboring growers on planting dates and hybrid maturities.

Using different planting dates and hybrid maturities can be used to reduce the risk of cross-pollination between fields. However, emphasizes Thomison, the difference in maturity dates has to be great enough so that the hybrids will not overlap during flowering.

- Situate a cornfield to prevent prevailing winds from contaminating a crop.

"Agronomists in states to the west of Ohio indicate that the south and west edges of non-GMO fields may be more vulnerable to pollen drift because the prevailing winds during the summer are from the southwest," said Thomison. "In Ohio, I'm not sure how consistent this wind pattern is but if it is an issue, then it may be particularly useful to follow recommendations regarding isolation distances and border row on these sides of non-GMO fields."

Other factors that might contribute to the purity of non-GMO corn include the purity level of seed planted, planting errors, volunteer corn resulting from no-till or minimal tillage practices and environmental conditions such as drought or flooding.

"Planting operations to manage pollen drift are only part of the process of producing an IP corn grain crop. Other major issues include harvesting, drying and storage, along with thorough record keeping," said Thomison.

He said that seed certification agencies like the Ohio Seed Improvement Association (http://www.ohseed.org/) offer IP programs for grain. These IP programs assist in preserving the genetic identity of a product, and verify specific traits through field inspections, laboratory analysis and record keeping.