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BT Corn Growers Have Responsibility to Provide 'Refuges'

MANHATTAN, Kan. – Bt corn has been the subject of plenty of headlines lately – some linked to fact and some not – but one thing's for sure, the proper use of Bt corn is an effective way to control destructive corn borers without the field-wide use of traditional, broad-spectrum insecticides, a Kansas State University entomologist said.

To keep Bt corn effective against corn borers, however, growers have a responsibility to abide by certain management guidelines provided by seed companies when they buy the seed, said Randy Higgins, state leader in entomology with K-State Research and Extension. The guidelines were mandated by the U.S. Environmental Protection Agency [EPA] and are described in some detail within grower agreements that every purchaser of Bt corn must sign.

A key part of the guidelines is that no more than 80 percent of each farm's corn crop may be planted in Bt corn. Non-Bt corn refuges must be planted within one-half mile of the Bt corn and should be within one-quarter mile if the farm is located in an area where treatment of the refuge is likely to occur. Thus, the non-Bt refuge corn must be planted within, adjacent to, or near each Bt corn field.

The refuges serve as an area where Bt-susceptible corn borers can grow to adulthood, Higgins explained. These adults carry genes for susceptibility to Bt toxins. By emerging from non-Bt corn refuges planted near the Bt corn, large enough numbers of them can move into the Bt corn to ensure that no Bt-resistant corn borers are able to mate with each other.

"Because Bt corn is so effective in controlling corn borers, there is concern that resistance to Bt could develop quite rapidly unless appropriate non-Bt corn refuge plantings are employed to maintain a susceptible population of corn borers," he said. "As long as there are enough Bt-susceptible corn borers to mate with any potential survivors [potential Bt-resistant individuals] in the Bt corn field, the corn borer offspring are likely to remain susceptible.

"We believe this science-based plan will maintain corn borer susceptibility for many years into the future if there is good cooperation and compliance from corn growers."

The recent emphasis on compliance is important because a survey of Bt corn growers indicated that some growers may not fully understand all aspects of the rules that govern Bt corn commercialization.

"Somewhere over 70 percent of corn growers appeared to be abiding by Bt corn and non-Bt corn refuge proximity and acreage percentage restrictions, which means that some are not fully complying with these guidelines based on the 2000 growing season," Higgins said.

Results of the grower compliance survey can be viewed at the National Corn Growers Association website <http://www.ncga.com>.

Seed corn dealers, commodity groups, university extension specialists, and regulators are working to help increase grower and crop consultant awareness through vigorous educational programs, Higgins said. This effort is designed to help raise compliance as corn growers and consultants become familiar with the more consistent refuge planting requirements now required by all seed companies.

Choosing not to implement an acceptable insect management plan means that you could be out of compliance and may make you subject to penalties, the entomologist added. Registrations granted by the EPA also may be withdrawn.

Higgins said other points for farmers to remember include:

- * Don't mix Bt corn and non-Bt corn seed in the seed hopper.
- * If a split planter arrangement is used to establish the refuge, where some seed hoppers contain Bt corn and some non-Bt corn, refuge areas should be at least six rows wide to minimize the risk of resistance development, because corn borer larvae sometime move from plant to plant.
- * Don't treat refuge corn with Bt-based insecticides. You may be treat with non-Bt-containing insecticides if economic thresholds are reached or exceeded.
- * Your neighbor's corn cannot serve as your refuge.
- * The refuge should be planted and managed in a manner similar to the Bt corn.

"Remember, the purpose of the refuge is to ensure that enough unselected corn borer moths move into Bt corn fields so that no rare resistant corn borer moths find other Bt-resistant moths as mates," Higgins said.

For more information on required resistance management and Bt corn planting guidelines, Higgins suggested that growers talk with their seed dealers and re-read materials that were distributed when the Bt corn seed was ordered or picked up.

The results of Bt corn efficacy trials conducted by K-State entomologists are available at <http://www.oznet.ksu.edu/Entomology/extension/topics.htm>.

For more information on corn insect management, a newly revised publication "Corn Insect Management 2001" is or soon will be available at county Extension offices and is posted on the World Wide Web at <http://www.oznet.ksu.edu/library/ENTML2/MF810.PDF>.

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