

Factors Affecting Adoption of CRW Corn

by Bruce Erickson

Knowing what farmers buy, and more importantly why they buy has always been of great interest to companies that sell to farmers. This is especially true with innovations such as biotechnology or precision farming that often bring along a new set of rules.

A Purdue University study found that as farmers approach late middle age they are less likely to plant Bt hybrids, those that contain a protein that kills corn rootworms or European corn borers. The 2004 study, based on surveys and discussions with about 1,000 Indiana farmers who grew at least 200 acres of corn, also revealed other factors that affect planting decisions such as refuge requirements, marketing restrictions, other insect threats, and familiarity--farmers experienced in biotech crops are more likely to plant Bt corn hybrids. Farm size, often a major factor in adoption where economy of scale is important, was not a factor.

As young farmers become more comfortable with biotechnology their adoption of genetically modified corn seed increases, said Corinne Alexander, a Purdue agricultural economist and the study's lead researcher. Older farmers who've never planted Bt hybrids aren't likely to start, however. "What we found was age was a significant predictor in Bt corn adoption," Alexander said. "We found as producers get older and gain experience they are more likely to adopt Bt corn rootworm, but once they reach their late 40's they become less likely to adopt the technology."

Indiana is an interesting case study for genetically modified corn adoption because the state has generally lower pressure from European corn borers, but corn rootworms are a much more serious pest. The western corn rootworm is the most common rootworm in the eastern Corn Belt, and in years past rotating corn with soybeans was sufficient to kill most of the larvae. However, a behavioral variant of the western rootworm has allowed it to flourish in corn/soybean rotations. As a result, many producers routinely treat for rootworms. But while U.S. corn farmers as a whole are planting 35% of their acres to Bt hybrids, in Indiana it is just 15% of corn acres.



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The requirement of planting a refuge when using Bt crops hinders many from adopting this technology.

Complicating adoption is that currently corn rootworm-resistant (CRW) corn is not approved for sale in the European Union (EU), and the eastern Corn Belt has a substantial number of established buyers who offer a higher price for non-GM corn destined for food production or export to the EU. Many growers noted in surveys that they had no marketing options for GM corn, yet in reality all farmers in Indiana are within 50 miles of a buyer of corn not approved for sale to Europe. This finding points to the continued need to provide information about which traits are not approved in



certain markets and in locating buyers for their grain. "If producers are thinking about planting corn rootworm-resistant corn, they will first want to make sure their buyer is willing to buy that corn," Alexander said. "You wouldn't want to plant CRW corn without checking with them, because it doesn't so much matter what the European Union wants, what really matters is what your buyer wants."

In focus group discussions all of the growers said that refuges are relatively easy to implement and would not deter them from planting CRW corn. However, the requirement to have an insect refuge management plan was significantly and negatively related to CRW adoption. Farmers who plant Bt corn are required by the U.S. Environmental Protection Agency to plant 20 percent of their acreage within, around or adjacent to those biotech crops in non-Bt corn hybrids. Specific types of planting equipment, such as models that have a central hopper for seed, can make it more difficult to implement refuges, a factor noted in focus groups. Indiana producers have less experience with insect resistance management due to less past use of Bt corn.

Fields where seed-attacking insects such as white grubs, wireworms, seedcorn maggots, and a host of other insects are at higher risk may complicate the purchasing decision also, as insecticide seed treatments or soil-applied insecticides are a first line of defense against these pests, and are also rootworm control options.

Thuy Van Mellor, a research associate, assisted Alexander in the Purdue study. The study, titled "Determinants of Corn Rootworm Resistant Corn Adoption in Indiana," appeared in a recent edition of AgBioForum and can be read online at <http://www.agbioforum.org/v8n4/v8n4a01-alexander.htm>.

