



13750 S. Sedona Parkway, Ste 5

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Contact: Jamie Wilson
Phone: (517) 668-2676

Genetically-Modified Corn Hybrids Protect Against Pests

LANSING, MICH. – As the invasive Western Bean Cutworm (WBC) continues to impact corn fields across Michigan, the state’s nearly 12,000 corn farmers continue to search for the best method of protection against this destructive pest. Native to the western United States, WBC larvae invade corn ears late in the season and cause significant kernel damage due to feeding which results in a loss in yield for the farmer. This damage also often leads to a reduction in grain quality by promoting the growth of harmful fungi and increasing the potential for mycotoxins. The effects of WBC infestations have resulted in economic damage in certain locations and fields in Michigan since 2007 and the threat continues to spread each year.

With so much at stake, many seed and insecticide companies have developed products which offer WBC control options. One such type of product which is escalating in popularity is the genetically-modified (GM) corn hybrid with built-in genetic protection against WBC. These WBC control GM hybrids, available in brand names such as Herculex and SmartStax, contain a gene from a soil bacterium that is harmless to humans and almost everything else, with the exception of certain corn-eating pest insects like WBC. Shown in numerous research trials to be effective, these GM hybrids are being planted in increasingly large numbers as farmers combat a growing WBC population in Michigan.

While years of experience and repeated scientific research efforts have confirmed that GM corn is safe for people, animals and the environment, the growing use of GM corn with WBC control has led some environmentalists to once again express concern for Michigan’s diverse ecosystem. To help quiet these growing fears, the Corn Marketing Program of Michigan (CMPM) partnered with Michigan State University (MSU) to assess the ecological effect of WBC control GM corn hybrids versus other WBC control methods in Michigan. The results of a two-year study by Dr. Mark Whalon, principal researcher and professor of entomology at MSU, shows that GM corn designed to help control WBC is more beneficial ecologically than a WBC insecticide spray and offers a range of other environmentally-friendly benefits as well.

To identify the ecological impact of WBC control GM hybrids versus WBC control insecticides, Whalon sprayed conventional corn with a safe WBC insecticide and compared the diversity of beneficial species in that field against the beneficial species in an unsprayed conventional corn field and an unsprayed WBC control GM corn field. The ecological monitoring systems tracked 32 beneficial species to measure the ecological health of each field. These beneficial species can be predators, parasites, pollinators or good pathogens that keep the harmful species (such as WBC, other pests or corn diseases) in check. While both are necessary in a thriving ecosystem, a healthy balance (meaning the beneficials outweigh the detrimental) is important to ensure an abundant harvest at the end of the season. By testing the ecological diversity of the three fields, Whalon was able to establish the different ecological impacts of the two WBC control methods.

The results of Whalon’s scientifically replicated studies show there was no difference between the GM corn and the conventional corn in terms of diversity when insecticides were not used. In other words, the presence

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of the genes for resistance to pest insects in the GM corn did not hurt the overall abundance and diversity of beneficial species in the corn field. On the other hand, when insecticides were used in the conventional corn to control WBC, the beneficials were set back while the GM corn, which did not have to be sprayed to control the WBC, remained high in beneficial diversity.

This newly found benefit to GM crops joins a growing number of other GM advantages. GM crops have also been shown to make good water and soil erosion stewardship practices such as minimum tillage and no-till systems easier to implement for growers. These environmentally-friendly farming techniques reduce a farmer's fuel use, soil erosion and insecticide applications and help them preserve the natural resources they utilize year after year.

This data will help the corn industry in Michigan, as well as the environmentally-concerned public to better understand GM corn crops and their impact. "As farmers, the environment is a top priority for us," said Clark Gerstacker, CMPM president, National Corn Growers Association Corn Board member and corn farmer from Midland. "We want to ensure the public that we are growing feed, fuel and fiber in the most environmentally-responsible ways possible. This research will help us show that one of the best tools available today, GM hybrids, are a safe and effective way to produce a bountiful harvest."

Headquartered in Lansing, the CMPM is a legislatively-established statewide program that utilizes one-cent per bushel of Michigan corn sold. Investments are made in the areas of research, education, market development, and new uses in an effort to enhance the economic position of Michigan corn farmers. The CMPM works cooperatively with the Michigan Corn Growers Association (MCGA), a grassroots-membership association representing the state's corn grower's political interests since the 1970's. Michigan's corn industry adds more than one billion dollars to the state's economy annually and in 2010, Michigan's corn farmers harvested a record setting crop of more than 315 million bushels. For more information, visit the website of the MCGA and the CMPM at www.micorn.org.

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