13. Insect Resistant Sweet Corn

Florida ranks number one in the U.S. for production and value of fresh market sweet corn. Two of the most important insect pests of Florida sweet corn are fall armyworm and corn earworm. Corn earworm initially feeds on the silk, and then tunnels downward, leaving a trail of damage and waste that often ruins the entire ear. Fall armyworm causes similar damage, though its larvae may also enter ears by burrowing through husks on the side. Other economically significant insect pests in Florida sweet corn include the corn silk fly, which is a major pest only in the southernmost production areas of the state, and the lesser cornstalk borer, which appears sporadically in southern Florida.

Fall armyworm is considered the more serious pest of sweet corn in Florida. Fall armyworm survives winters in the warm, humid conditions of south Florida and is therefore a threat to the state's sweet corn throughout the growing season. The internal feeding habits of fall armyworm larvae make them only susceptible to pesticide applications during their migration down the corn stalk to newly developing, pre-silk ears. During this window of treatment opportunity, some sweet corn growers apply insecticides as much as twice daily in order to prevent fall armyworm larvae from reaching and feeding on young ears. Once fall armyworm larvae enter ears to feed, they are virtually impervious to insecticide sprays. Typically, insecticide applications then are continued throughout silking to control fall armyworm larvae that survived pre-silk applications and have not yet entered the plant. In total, an acre of sweet corn in Florida will be treated with insecticides an average of 12 times per season.

A commercialized field corn variety transformed with a Bt gene was bred with sweet corn cultivars to produce transgenic Bt sweet corn. Novartis (now Syngenta) Seeds registered the Bt sweet corn cultivars with EPA in 1998 and marketed them under the trade name Attribute. In field trials, the season-long insect protection of Bt sweet corn cultivars consistently produced more marketable yield than non-Bt cultivars, and required between 42% and 84% fewer insecticide applications. Because Bt sweet corn does not provide protection against the corn silk fly, its adoption in Florida is not expected to eliminate insecticide applications altogether, but rather is expected to drop average per season applications from 12 to 2 on 80% of the acreage. Despite the potential beneficial impacts of planting Bt sweet corn, Florida sweet corn growers are not planting the transgenic cultivars due to concerns regarding potential lost sales.

Potential Impacts of Insect Resistant Transgenic Sweet Corn:
Change in Production: 22 million lbs/yr increase
Change in Production Value: $3.9 million/yr increase
Change in Insecticide Use: 112,000 lbs/yr reduction (79% reduction)
Change in Production Costs: $1.3 million net savings in insect control

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