



The Sweet Taste of Success

Colorado State Researcher Meets the Challenge of a Sweet Corn Pest

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Knowledge to Go Places

Sweet corn is an important component of the agricultural economy of western Colorado. Sweet corn acreage has grown consistently since 1990, and local marketing companies negotiated national distribution contracts in 2001. Sweet corn is sold under a Market Order, which has strict quality guidelines, and corn from each field is inspected before shipment is allowed. Dusky sap beetle, *Carpophilus lugubris*, is a pest that attacks and contaminates corn ears. If infestation levels exceed those specified by the Market Order, the field is rejected and the grower faces a financial loss. If sweet corn shipments have consistent contamination that falls within the Market Order specifications but is detectable by grocers and consumers, extension of national marketing contracts is jeopardized. This is what occurred in 2001.

In crops where quality is not of such concern, the black, quarter-inch-long dusky sap beetle often is ignored, but Colorado super-sweet corn, particularly Olathe-grown sweet corn, has developed a national reputation for quality. The 2001 sap beetle infestation resulted in almost 10 percent of the sweet corn crop being rejected and a loss of more than \$500,000 to growers. The future of the specialty crop was in jeopardy. An emergency plan for dealing with the beetle was required. Bob Hammon, who was working as a research scientist at the Agricultural Experiment Station Western Colorado Research Center and who now works as an area extension agent with Tri-River Cooperative Extension, was called in to develop a strategy for dealing with the pest.

Traditionally, growers have concentrated

their pest management efforts on the corn earworm. Corn that is shipped nationwide often is sprayed with insecticide several times throughout the season to control corn earworm. "At the end of the season, growers were just bumping up their schedule to twice a week in order to deal with the dusky sap beetle," Hammon recalls. There was no research to justify the scheduling decision. Hammon decided that it was time to investigate the biology of the dusky sap beetle for clues as to how the pest might be managed.

With funds from the Agricultural Experiment Station and the Colorado Specialty Crop Program, Hammon began his research. A six-acre field of sweet corn was purchased for studying the dusky sap beetle's biology and for trying different sprays and schedules. Hammon caged beetles on ears of corn to examine their lifecycle. He discovered that the adult beetles were in the field from the moment the corn pollen started falling but that the adults did not enter the ears until about seven days before harvest. The beetles were attracted to the fermentation process that was going on as the corn was producing its sugars. After entering the ear through the freshly grown silk, the adults would take about three days to produce their pale, worm-like larvae. With this finding, Hammon was able to revolutionize the spray schedule for the pest, concentrating the sprays into the final few days before harvest. Hammon credits Leonard Felix, owner of the Olathe Spray Service, with putting the new spray schedule into an affordable system and testing it on commercial fields. "Once the spray schedule change was made, there were no more rejected acres, and sap beetle infestations in treated fields

dropped to the lowest levels experienced in years," Hammon says.

Hammon notes that his spray schedule does not necessarily reduce the amount of pesticide used on corn but ensures that the sprays are effective. Despite the fact that sweet corn is sprayed a number of times throughout the growing season, Hammon points out that pesticide residues are undetectable on corn kernels. "The husk is very effective at protecting the corn from exposure to pesticide," Hammon says. However, Hammon is interested in finding ways to reduce the use of pesticides on sweet corn by means of pheromone traps

using fermenting attractants like bread dough or rotten fruit. These methods might be particularly applicable to the fresh market sweet corn industry, where corn is handpicked several times over a series of days.

This year, growers have enthusiastically accepted Hammon's pest management program, and Hammon is continuing his study of the dusky sap beetle. In addition to pheromone trapping, he is investigating how post-harvest management might impact the huge flights of the beetles that typically occur in October. "Time will tell," Hammon says about his pest management efforts.



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A Growing Concern: Colorado Sweet Corn

Before Colorado sweet corn became a nationally recognized quality crop, Olathe, Colorado, was just another struggling small town. In the late 1970s, area farmers were having a hard time making ends meet. There wasn't much of a market for sugar beets and barley, the crops traditionally grown in the area. Then, Olathe farmers started cultivating new varieties of sweet corn, and the town's economic situation turned around. Every year in August, the townspeople of Olathe now celebrate their winning crop with a Corn Festival that attracts nearly 20,000 participants.

The cultivation of corn in Colorado can be traced back to the ancient Anasazi, who farmed at nearby Mesa Verde. Olathe sweet corn is a descendant of that staple food. Sweet corn is low in fat, sodium-free, and a good source of fiber and vitamin C.