

Blocking Sugarcane Borers

For all its towering height and tough, bamboo-like stalk, sugarcane can easily succumb to a small insect pest called the sugarcane borer, which chews hungrily into the plant's core—and growers' profits.

In Louisiana, scientists are working hard to undermine the borer with 12 new strains of sugarcane germplasm that naturally resist or tolerate its destructive tunneling. By crossing these borer-resistant strains with commercial cultivars, they hope to ease the need for using insecticides.

"The borer is the most important insect pest of sugarcane in Louisiana and probably Florida, too," says William H. White, an Agricultural Research Service entomologist involved in the project.

While effective, insecticides add to growers' production costs and pose an environmental danger. Louisiana's many waterways make this "a highly visible concern," says White, who is in ARS' Sugarcane Research Unit at Houma. His lab sits on the edge of sugarcane country in southern Louisiana, where about 35 percent of the nation's \$1.5-billion crop is grown.

White's cane-breeding ARS colleagues are Benjamin L. Legendre, Jimmy D. Miller, and David M. Burner, along with Louisiana State University's Thomas E. Reagan and Scott B. Milligan. Legendre heads the Houma lab, and Burner is a geneticist there. Miller leads ARS' Sugarcane Research Station in Canal Point, Florida.

To develop borer-resistant sugarcane, they used a process called

recurrent mass selection. It calls for screening thousands of cane plants from many different parental lines. Plants that best withstand borer attack are selected out and crossed with other hardy survivors. This is repeated many times to strengthen resistance traits in progeny.

"Gradually," says White, "you start shifting the average level of

relying instead on help from parasitic wasps and predatory insects.

"It's a race," says White of their efforts to battle borers by such chemical and biological means. For once the larva tunnels into the stalk, it can feed, grow, and pupate in relative safety.

On susceptible cultivars, borer numbers can soar to levels that inflict serious economic harm. One indicator of dangerous levels: If scouting shows 1 out of 20 stalks of a susceptible variety to be infested, then a grower might want to consider spraying to prevent significant economic loss.

But White says, "We know some cultivars have harder rinds that prevent the larvae from getting into the stalk quickly."

Such traits help "raise the economic threshold before insecticides are recommended. And, you're buying time to allow your beneficial insects to catch up."

This fits in well with integrated pest management in which chemical, biological, and cultural

controls are used in concert. In Louisiana, IPM programs have helped growers reduce their insecticide use. Instead of four to five applications per acre each season, they are averaging less than two.—
By **Jan Suszkiw**, ARS.

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WILLIAM WHITE (K8143-1)

Adult stage of the sugarcane borer, *Diatraea saccharalis*.



resistance a little bit higher each time."

Of the 12 germplasm lines—or clones—the breeders developed, one called US93-15 showed some of the highest resistance levels. When deliberately exposed to borers in field plots, that line's stalks suffered 85 percent less internodal damage than susceptible commercial cultivars.

A grower's battle against the pest begins soon after it hatches from eggs laid on leaves. At that point, insecticides are the hardest-hitting weapon. But growers use them sparingly,