



Boll Weevil Outbreak Spreads

*"First time I saw the boll weevil,
He was sitting on the square.
Next time I saw the boll weevil,
Had his whole family there."*

What that folk song, more than 75 years old, fails to explain is just how numerous that boll weevil's family can get.

Arizona cotton growers are finding out.

Boll weevils have pushed their territory in Arizona outwards by 60 miles or more from the area infested in 1982, said University of Arizona entomologist Dr. Leon Moore. Last year, farmers fought the weevil on at least 56,000 acres of Arizona cotton fields, mostly between Buckeye and Wellton.

Insect scouting in fields since then has shown boll weevils all the way from Yuma to Queen Creek, and from Pima County fields near Marana to La Paz County fields along the Colorado River.

Photograph: Boll weevils' prominent snouts are their trademark. (Photos by Ted Bundy.)



Top: Monitoring traps for boll weevils contain two chips impregnated with the weevils' pheromone, a sex scent that attracts them, plus one chip impregnated with insecticide.

Bottom: University entomologist Marc Lame of Phoenix examines a trap near Eloy.

The state's weevil outbreak started with sightings in a single field between Buckeye and Gila Bend in 1978.

Despite non-chemical control methods used on most of the affected farms last winter, half or more of the cotton fields in the state will need treatment for boll weevils this season, predicted Moore.

Boll weevil numbers increase about 10-fold every generation in the field. Each generation takes just 3 weeks to reproduce, so each weevil in the spring can have 10 million descendants by harvest time.

Square Meals

The adult weevils chew their way into cotton bolls and lay eggs in them. They do the same to squares, the buds that develop into bolls. A square with eggs in it will not produce a boll, but will produce more weevils. The immature grubs that hatch in squares or bolls eat out their homes from the inside.

UA entomologist Dr. Theo F. Watson and co-workers are researching the weevil's biology and survival ability under Arizona conditions.

Watson, an Arkansas native, said, "I've seen weevils take up to half the crop in the South, and they have the potential to do that here, too." The boll weevil in Arizona is the same species as the notorious beetle that tore across the Southeast at the turn of the century, and has plagued cotton fields there ever since.

Watson said that correct use of insecticides can minimize crop damage in fields attacked by weevils, but the treatments have costs, too.

Each treatment runs \$5 to \$7 per acre. For most fields with weevils, treatments need to be repeated every few days to catch the insects when they are not protected inside squares or bolls. Some growers sprayed 20 times or more last year. Recommended insecticides include methyl parathion, azinphosmethyl and phosmet.

Spraying infested fields early in the season, when the first squares are pinhead-size, helps manage weevil numbers, but farmers know that those early applications also hurt some beneficial insects that prey on other cotton pests.

To use insecticides most effectively and to avoid unnecessary treatments, growers need to carefully sample each field for boll weevil populations. The university has published an information sheet about early-season weevil control to give growers guidelines about monitoring and management. Also, the UA Cooperative Extension Service arranged a well-attended series of meetings this spring for growers and pest management professionals.

Heat Units

At those meetings, Dr. Roger T. Huber explained how keeping a tally of "heat units" can help growers predict stages in the growth both of cotton plants and of weevil populations. The heat units are figured on the number of degrees by which each day's median temperature exceeds a threshold of 55 degrees F. The accumulation of heat units during the spring correlates with the development of cotton plants. That helps growers know when to sample their fields and when to treat them, if treatment is warranted.

Huber, who has also developed heat-unit measures for other major insect pests, is refining the system for boll weevils by collecting further information on timing of their population growth this year.

Watson is coordinating this year's tests of control measures against

the boll weevil early in the season. In test fields in Mohawk Valley and near Eloy, he is comparing the effects of different treatments on subsequent numbers of boll weevils, other pests and beneficial insects.

Another weapon against the boll weevil, an end-of-season plowdown to bury unharvested bolls, helps fight another major cotton pest, the pink bollworm, as well as the weevil. It removes the winter homes favored by both insects.

The Arizona Commission of Agriculture and Horticulture has set plowdown dates for cotton fields. More than 95 percent of affected acreage in Yuma County, about 80 percent in Pinal and Pima counties, and about 60 percent in Maricopa County was plowed down by the prescribed dates last winter, said Marc L. Lame, coordinator for the UA Integrated Pest Management program in Maricopa County. Wet weather kept many farmers from harvesting cotton when they wanted to, he pointed out.

Moore said this spring that another season of tests and observations will be needed to gauge the plowdown's effectiveness for boll weevil control in Arizona.

"It helps, but we can't be sure how much yet," he said. "There are an awful lot of weevils still out there this spring."

Winter Quarters

In simulation tests last winter, Watson found that no weevils survived in cotton bolls buried 3 or 6 inches below the surface of the ground. Many, however, survived from December into May in bolls at ground level and bolls held above the ground, as if on uncut stalks.

Overwintering boll weevils have also found a home on the orange-blooming globe mallow plants that are common in the state's cotton-growing areas. That might reduce the strength of cotton plowdowns for controlling the weevils. "They can last a long time just feeding on globe mallow buds," said Watson, "but, so far, none has been found to breed on the globe mallow. They only develop in cotton."

The UA entomologists have recommended that farmers plan for an early harvest this year to prevent a large buildup of adult weevils in October and November cotton.

The unusually cool spring got Arizona cotton off to a late start this year. That could strengthen one possible advantage for Arizonans in their weevil battle. The early squares harboring weevil larvae usually fall off the plant. Younger plants mean fewer leaves to shade off the sun. Watson and others are looking optimistically to see whether the dry heat of late May and June will fry many of the vulnerable weevils where they lie.

Arizonans planted only about 240,000 acres of cotton this year, compared with about 520,000 in 1982. The cutback comes from federal programs to reduce overstocked supplies. It will not help with boll weevil control, Watson predicted. "You'll have all those weevils go on a smaller acreage, so they'll just be more concentrated," he said.

Whether boll weevils are here to stay as a major pest, or can be pushed back to minor status depends mostly on the effectiveness of winter plowdowns, said Moore. An earlier Arizona bout with them ended in 1965 when enforced plowdowns against a combination of pests nipped a small outbreak of weevils even before they got to the buds.

This time, the weevils have gone much further.



Ray Bankston, field supervisor for Growers Pest Management Corporation, checks a weevil trap east of Eloy with Lame. The area has been a hot spot for boll weevil populations.