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Corn Acreage May Add To US Cotton's Bollworm Woes

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NEW YORK (Dow Jones)--The top cotton pest could swarm into U.S. fields in 2008-09 as corn acreage is expected to soar, increasing the likelihood that the worm that infests both plants will feed on cotton with more tenacity, analysts say.

The cotton bollworm, which crept into 6.7 million acres of the 15.27 million U.S. cotton acres planted in 2007, attacks corn under the name **earworm**. No matter what it's called, the insect caused a loss of 229,186 bales of U.S. cotton last year. The bollworm was recently shown to be resistant to transgenic technology, the latest tool in crop insect prevention. The 86 million acre corn crop expected in 2008 could usher in a feeding frenzy for the pests, cotton experts said.

Bacillus thuringiensis, commonly known as Bt, is a protein produced by plants that have been genetically modified to be toxic to some insects. Bt was introduced in 1996, but between 2003 and 2006, populations of bollworm were found resistant to first-generation Bt in Mississippi and Arkansas cotton fields, according to research done by Bruce Tabashnik, an entomologist at the University of Arizona. In 2006, bollworms in Georgia were also showing resistance to first-generation Bt cotton, Tabashnik said.

Corn's growing season ends when cotton starts to bear fruit, providing a new host for a growing worm population.

"Corn is an excellent host for bollworm," said Fred Musser, a professor of entomology and plant pathology at Mississippi State University. The worm grows on corn and the mature adults easily migrate to cotton fields and lay their eggs on plants. The larvae take up residence on the plant, eating the boll, Musser said.

Arkansas and Mississippi showed more occurrence of resistant bollworm than other states due to low numbers of non-Bt areas referred to as refuges, according to Tabashnik's research. In these refuges, cotton is cultivated to provide a breeding ground for bollworm that isn't exposed to Bt. Unexposed insects mate with resistant insects, passing on the non-resistant trait and improving the effectiveness of Bt, Tabashnik said.

Arkansas and Mississippi may see a larger population bollworm in 2008, according to experts there.

"We have a good chance of having a good population of them (bollworms) this year," said Glen Stuebaker, entomologist with the University of Arkansas Cooperative Extension Service. "We expect them to build up in corn."

Arkansas planted 860,000 acres of cotton in 2007, 85% of which were Bt. Bollworm infested 850,000 of those acres, and led to a 1% yield reduction. Bollworm damage claimed 25,563 bales of Arkansas cotton and producers paid \$6 an acre to treat against them in 2007.

Damage done by bollworms depends on the time of year they strike and the concentration of worms on each plant, Stuebaker said.

Stressing weather conditions during cotton growth will weaken plants infested by bollworm, but not as severely as plants stricken by spider mites or thrips, said Angus Catchot, extension entomologist at Mississippi State

University. However, plentiful rain feeds other host plants, increasing the bollworm's habitat so it can spread into cotton, Catchot said.

In 2007, corn acres increased in Mississippi, but the timing of the crop's development was off, curbing the number of insects that made their way from corn to cotton. The worms move from uncultivated crops like crimson clover on roadsides in their first generation and then move to corn when it is silking. As the corn plants dry for harvest, earworms move on to cotton, which is in its squaring and blooming phase.

Mississippi saw bollworm infestation in 516,900 acres of the state's 660,000 planted cotton acres in 2007; 578,300 acres of the state's overall acreage contained Bt crops. Insecticide costs to treat bollworm were averaged at \$6 an acre in Mississippi, and 13,549 bales were lost to the pest.

But damage can be minimal if growing conditions allow, as Bt is only effective at preventing late infestation, and plants can bounce back almost 100% from early damage, Catchot said.

It's too early in the season to estimate the possible damage from bollworm infestation in the 2008-09 marketing year. However, there is a strong likelihood that late corn planting could give the bollworm an easy transition into cotton.

Tabashnik's research shows that more often than not, caterpillar pests of cotton and corn remained susceptible to Bt crops and most bollworm populations have not evolved resistance.

Some entomologists disagree that the bollworm has become resistant to Bt, arguing that genetic variability makes some gene pools more susceptible than others. A second generation of Bt has been introduced to counteract the insects, as well as "stacked" seed that contains mixed Bt and herbicide tolerance traits. But bollworms remain a problem.

"Bt toxins are one tool in the never ending battle to control insects," Tabashnik said. "The only strategy is to continue to change our methods of control to stay one step ahead."

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