Evaluation of Insecticide Oversprays for Control of Bollworms in Transgenic BT Cotton: TX

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Abstract:

A project was initiated to determine if insecticide application for bollworm control can prevent yield losses associated with cotton bollworm feeding on Bt cotton. An additional objective was to see if yield was affected by the insecticide application in the absence of the insect pest. Five treatments were applied at seven locations across Texas in 2012 and 2013. Insect survival was very low to non-existent in the untreated research plots. No yield differences were found between treatments. While the research was unable to evaluate the effects of treating surviving worm populations on Bt Cotton, no yield response was found between treatments in the absence of caterpillar pests.

Introduction:

Field scouting across the cotton belt has found Bt cotton to provide adequate control of cotton bollworm in most cases. However, some caterpillars survive on the Bt cotton and have the potential to cause yield losses. This can be a greater problem in fields where very high egg lay occurs which would theoretically results in greater survivorship.
State Extension cotton pest management guides provide instruction for managing bollworms in Bt cotton. These thresholds use insect counts for worms larger than ¼ inch in length.
A project was initiated to determine if insecticide application for bollworm control can prevent yield losses associated with cotton bollworm feeding. An additional objective was to see if yield was affected by the insecticide application in the absence of the insect pest.

Objectives:

Determine if any benefit is gained by treating Bt cotton for caterpillars.

Determine if yield is enhanced by insecticide alone without pest present.

Materials & Methods:

Design:	Randomized Complete Block – 4 replications
Locations:	Port Lavaca, TX, Corpus Christi, TX, Wharton, TX, College Station, TX, Ballinger, TX, Levelland, TX, Muleshoe, TX
Bt Varieties:	2012 - 4 Bollgard II and 5 Widestrike cotton varieties 2013 - 4 Bollgard II and 3 Widestrike cotton varieties
Treatments:	Untreated Control Prevathon (14 oz/a) Belt + Mustang Max (2 + 3.6 oz/a) Besiege (8 oz/a) Mustang Max (3.6 oz/a)
Data Analysis:	Whole plant inspections for worm survival and feeding injury of 10 plants / plot at 3, 7, 14 and21 DAT Lint Yield normalized to percent of untreated control.

Pest Populations

2012

Few bollworms and minimal feeding injury was detected in the trial areas. The highest worm population in East Texas and Coastal Bend tests was 2.5 small worms per 100 plants. No worms found in West Texas. One Coastal Bend location found cotton square borers at population below 13 per 100 plants.

2013

Bollworms and minimal feeding injury was detected in the trial areas. College Station trial was only test site to find a large worm where one worm was found larger than ½ inch long. This treatment had 8.5% feeding injury on fruit but the feeding was not a cause of significant fruit loss. Few worms were found in South and West Texas

Summary:

The results of this research are unable to determine if any benefit was gained by treating Bt cotton with insecticides for caterpillars because few caterpillars were found in the test areas.

There was no effect on yield when the insecticide was applied in absence of caterpillar pests. When data was combined it did not show yield response to insecticide application. Yield differences were found at individual locations but the results were not consistent across locations.

Table 1. Cotton yields normalized to percent of untreated for nine treatments at nine locations across Texas in 2012.

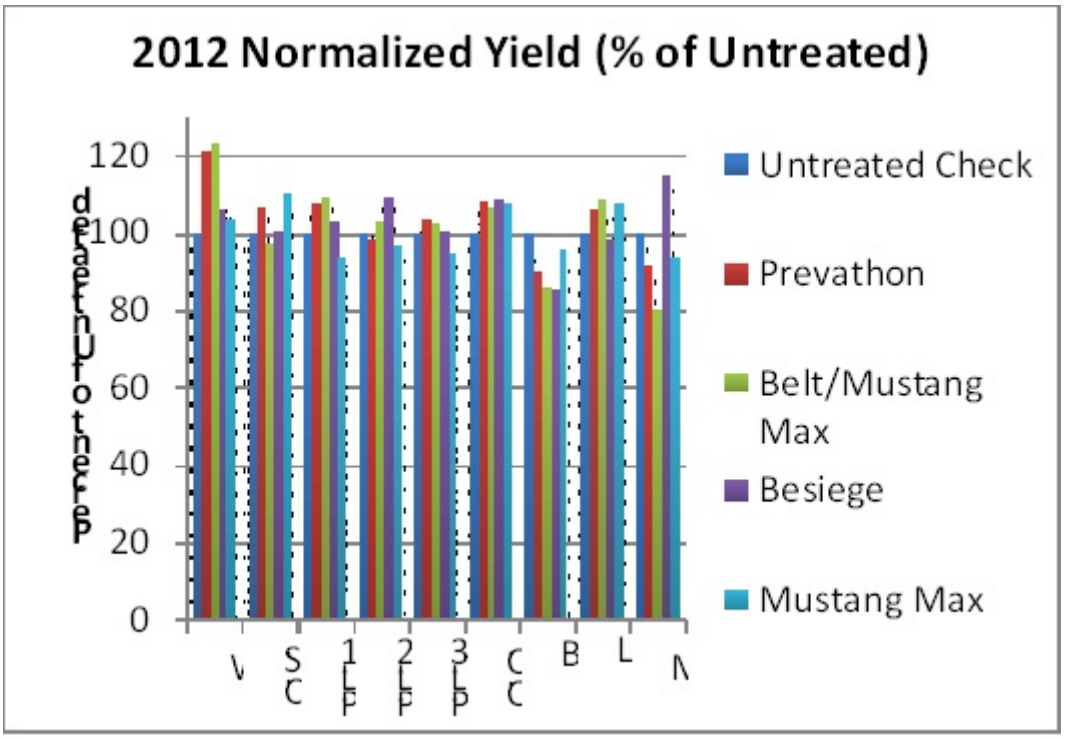


Table 2. Cotton yields normalized to percent of untreated for nine treatments across nine locations across Texas in 2012.

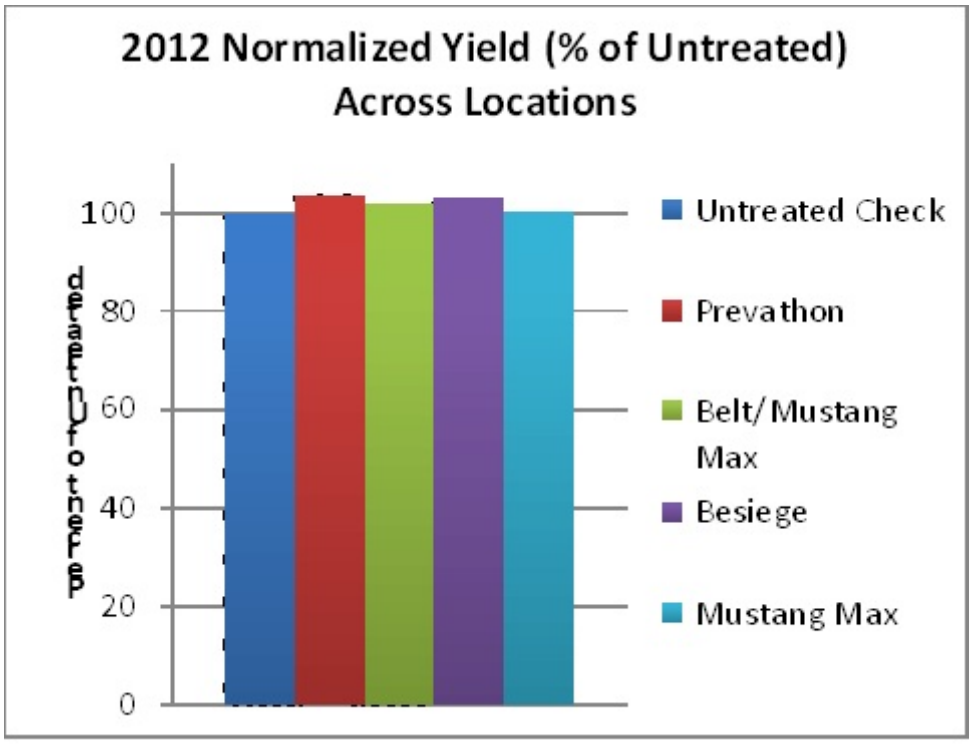


Table 3. Cotton yields normalized to percent of untreated for nine treatments at nine locations across Texas in 2013.

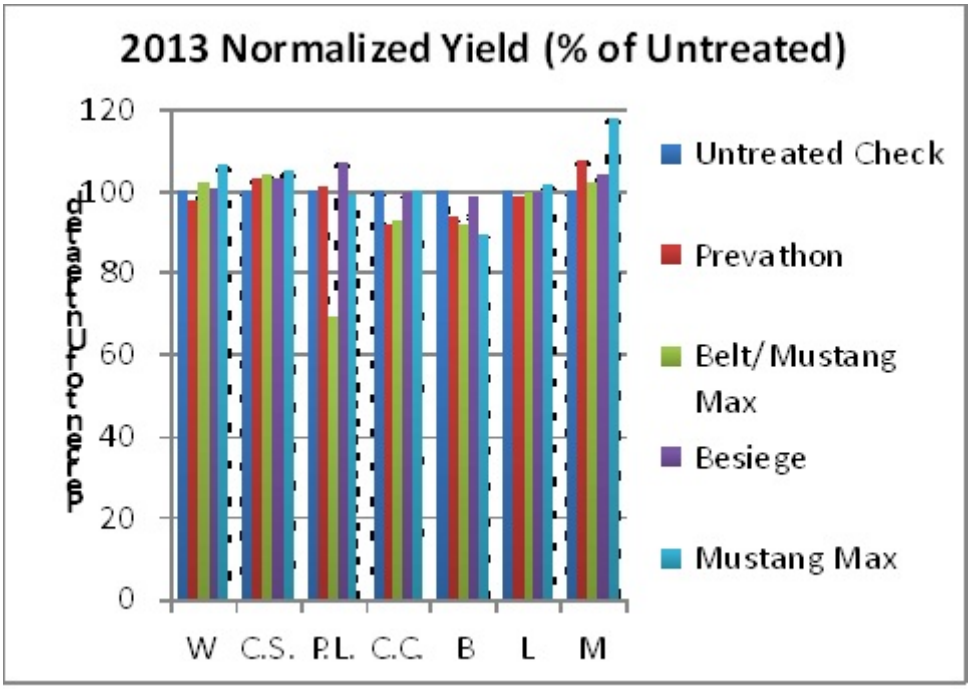
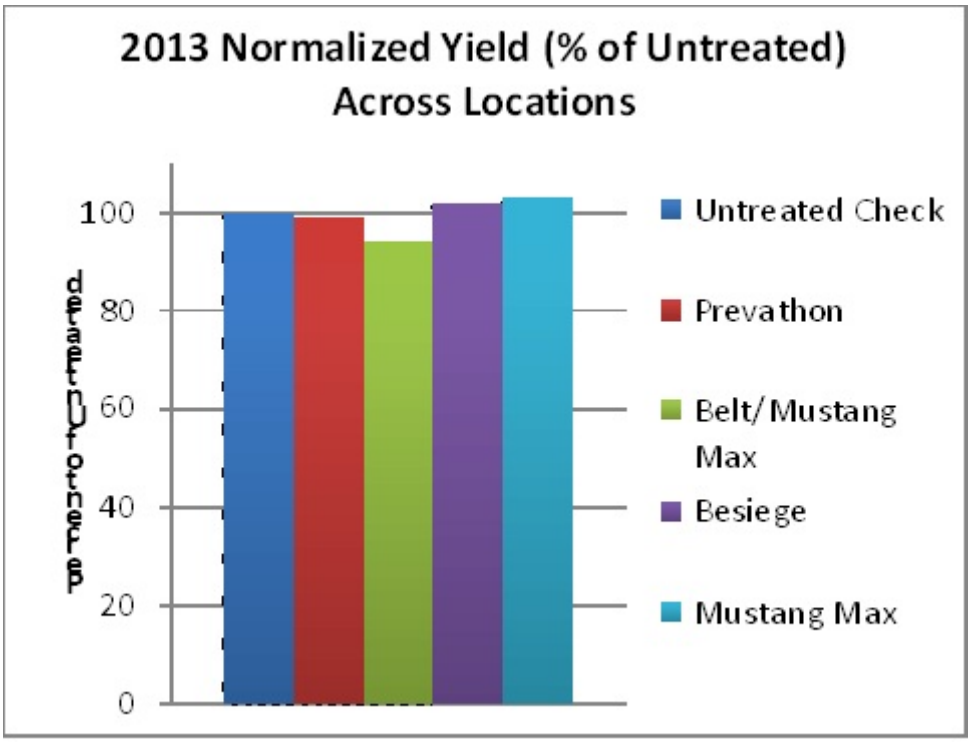


Table 4. Cotton yields normalized to percent of untreated for nine treatments across nine locations across Texas in 2013.



Acknowledgments:

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