

Evaluating the Merits of Sub-Threshold Effects of the Bollgard Technology on the Economics of Bollworm Management (Field 5A)

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Objective: The objective was to evaluate the Bollgard technology on the economics of bollworm management for the Texas High Plains.

Methodology: The experiment consisted of nine treatments including three varieties: the recurrent parent line with Roundup Ready (RR) transgenic traits (FM 960R), Roundup Ready-Bollgard stacked gene transgenic traits (FM 960BR) or Roundup Ready-Bollgard II stacked gene transgenic traits (FM 960B2R). Cotton was planted on May 20 to increase the potential of bollworm infestation at the study site. Each variety entry was to have each of the three insecticide treatment regimens: 1) untreated for bollworms, 2) treated at the economic threshold of 10,000 small bollworm larvae per acre, and 3) treated at the detectable level of small bollworm larvae (“no worm”). The design consisted of an RCBD 3x3 factorial with 3 blocks. Caterpillars, eggs and damage (squares, flowers and bolls) were monitored using visual technique on 10 whole plant samples per plot. Larvae were divided into age classes based on a size chart. Insecticide treatment #3 only was applied on August 24 since the economic threshold was never reached.

Results: Bollworms never exceeded our threshold in any of the three cultivars tested. Yield loss attributed to bollworms represented up to 223 lbs per acre. Unsprayed Bollgard technology provided 51 lb per acre advantage over the sprayed RR only variety. This represented about \$25.50 per acre net advantage over the sprayed RR variety. Numbers of larvae were reduced to such low levels in Bollgard II that they would go virtually undetected under weekly scouting (Fig. 1).

Our data indicated that infestations of bollworms around threshold levels are controlled equally well by both Bollgard technologies (Fig. 2). The technologies would also provide some cushion as far as insecticide application timing when needed and would delay applications until 3-4 days past egg hatch, when most natural mortality has taken place. The Bollgard will provide a no-spray environment for bollworm infestations around the threshold level. Bollgard II will provide protection against even higher numbers. The upper level of bollworm control is being investigated.

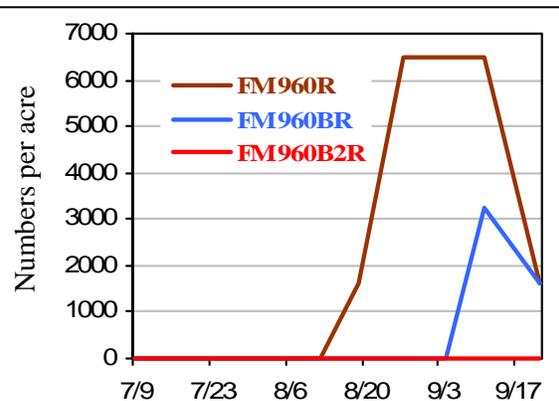


Fig. 1. Bollworm infestation in untreated cotton plots at Helms farm, 2004.

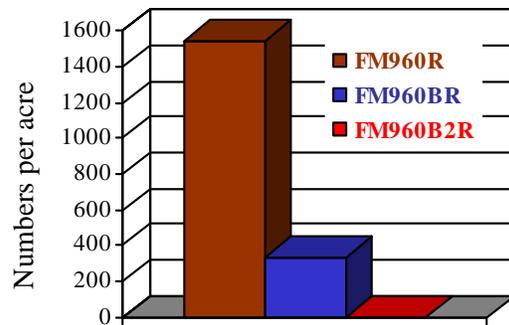


Fig. 2. Average boll damage that resulted in yield loss in untreated plots, 2004.