

Bollgard II resistance monitoring results

At a number of recent meetings in CQ, the issue of resistance in Bollgard has been discussed.

Here are some terms that may not be familiar:

- Cry1Ac was the toxin present in Ingard & is also present in Bollgard II. The production of Cry1Ac within plants declines late in the season. Genes that confer resistance to Cry1Ac are rare
- Cry2Ab is the new second toxin in Bollgard II. The production of Cry2Ab remains high throughout the season. Genes that confer resistance to Cry2Ab are more common than expected for *H. armigera* & *H. punctigera*.
- F2 screens test the grand-offspring from two field-collected moths that are mated.
- F1 screens test the offspring from a field moth mated with a Cry2Ab resistant lab moth.

Here is a dot point version of the main issues.

- There have been no reports of field failures of Bollgard II due to resistance.
- A higher frequency of Cry2Ab genes are obtained using F1 screens compared to F2 screens. The higher F1 value is most likely to accurately reflect the field situation.
- **This new F1 data suggests that the longevity of Bollgard II is likely to be much less than when industry was relying on F2 tests.**
- When the frequencies for the F1 tests are used in computer models, the number of generations until failure of Bollgard II is four times lower than when the frequencies from F2 tests are used.
- In 2007/08, the F1 test detected a distinct increase in the incidence of resistant genes, as compared to F1 tests conducted in previous years. This suggests that there has been a selection event which has increased the number of resistant genes in the natural population of *H. armigera*.
- A similar increase in Cry2Ab resistance genes over time has also been documented for *H. punctigera*.

Take Home message - **The industry is concerned about the high and potentially increasing frequency of Cry2Ab resistance alleles in populations of *Helicoverpa*. The results from resistance testing in 2008/09 will determine whether it is necessary to alter the RMP for Bollgard II.**

What should growers do? **It is critical that refuges are maintained to produce sufficient numbers of unselected susceptible moths that can dilute any potential resistance. Correct and timely pupae busting is also essential.**

Thanks to Dr Sharon Downes (CSIRO) for help with this article. For more information refer to the article by Rod Mahon & Sharon Downes in the CRDC Spotlight, Winter 2008 edition. Refer to Cotton Pest

Management Guide for details on refuges & pupae busting.

Local experience 07/08 - Conventional Cotton

Of the ~5000 hectares of CQ cotton in 0708, David & Greg Hutchinson planted the only conventional this year at Glendale, between Moura & Theodore. They grew 140 ha of Sicut 75, with the first fields planted on 5 October and the last on the 13 November. Yields averaged around 7 bales/ha for the earlier planting largely due to severe boll rot during the wet weather in Jan & Feb. However, the later planted crop yielded significantly better above 9 bales /ha.

The number of insecticides applications averaged around 10 and included Regent, Tracer, Affirm and Pegusus of which 7 were primarily for heliothis control. Good control was achieved for each application with over 10 days between applications. Pix was also required mid season to control growth. It also seemed to defoliate a lot easier than similar fields of 71BR.

Weed control: Pre-emergence – trifluralin and fluometurin and one post-emergence application of Staple resulted in much better weed control than two early glyphosate and one late application after cut out on Round-up Ready varieties and four glyphosate applications on the 70 BRF (though no pre-emergents were applied with the Flex).

There was a pretty good indication that planting conventional cotton in conjunction with Bollgard resulted in significantly lower insect pressure than would have been the case if solid conventional was planted.

The table below shows a summary of the fibre characteristics of each variety with Sicut 75 clearly the superior variety in micronaire, length & strength.

Variety	Micronaire	Staple	Strength
Sicut 289BR	4.23	1.17	31.2
Sicut 71BR	4.45	1.14	30.2
Sicut 70BRF	4.13	1.16	29.4
Sicut 75	3.93	1.21	31.8

Thanks to our overseas correspondent, Greg, who has just finished at the International Cotton School in Memphis. Hopefully, we will get a trip update out in a future cotton tale.

Study Tour

It was recently suggested that some growers & consultants may be interested in a study tour to another valley. Suggestions for things to look at include biological farming & alternative fertilisers and/or innovative irrigation (eg bankless channels). Please let me know if you are interested, and, if so, suggestions on when/where you would like to go. (susan.maas@dpi.qld.gov.au).