Cotton Catchment Communities CRC
Queensland Government Department of Primary Industries and Fisheries

COTTON TALES
Border Rivers

2006/07
7.
08/01/07

Emma Carrigan Development Extension Officer RWUE3 – 07 46716714

Egg Collectors

The Macintyre Valley has received funding from CRDC to employ egg collectors for the remainder of the 07 crop. Katherine Coleman will be starting this week and Courtney Richards in February to support our entomologists in their helicoverpa resistance testing.

The egg collectors will follow similar lines to previous years maintaining regular contact with growers directly or via local consultants for updates on recent sprays and in identifying "Hot Spots" If high pressure is experienced collections can be dropped in at the DPI. It is best that this happens Monday–Wednesday so that there is time to get them to Narrabri before the weekend.

Early season results from Bt resistance monitoring 2006/07 - Tracey Parker, Trudy Staines or Sharon Downes, ACRI, 02 6799 1500 or 0427 480 967.

Hatching, parasitism and species composition

Across all sampled valleys there were 7614 eggs submitted to the program until 21 December 2006. Of those eggs, 66% successfully hatched, 15% were parasitised (by anything, not just Trichogramma) and 26% were *H. armigera*.

The following data is on egg numbers, hatching, parasitism and species composition for the Macintyre valley. The % *H. armigera* values do not include hosts that are known to be dominated by this species (i.e., maize and sorghum). It should be noted that the levels of egg parasitism presented in the table are averages for each valley and that the actual levels vary greatly among properties.

It takes approximately 3 weeks to test material sent as eggs, including scoring for parasites and identifying all hatched material to species.

Table 1: Macintyre Valley (only).

Number Eggs	630
% Hatched	71
% Parasitised	3
% H. Armigera	15

F_0 screens for Cry1Ac and Cry2Ab resistance

F_0 screens are likely to pick up only individuals that are homozygous resistant (RR) to Bt. Around 2% survival is expected as a baseline for the doses of toxins used in the F_0 screens. **The following table shows the percentage of larvae surviving the F_0 screens for Bt resistance.** The number of larvae tested is in the parentheses to the right of survivorship. Data are provided separately for different regions, for Cry1Ac and Cry2Ab, and for *Helicoverpa armigera* and *H. punctigera*. So far, in all sampled regions the survival of larvae tested in our program is not greater than 2%, and is not higher than the survival detected in previous years. So our **data to date from the F_0 screens do not indicate any major changes from previous seasons in survival rates to discriminating doses of Cry1Ac or Cry2Ab.**

Table 2: Macintyre Valley (only)

	% survivors (no. individuals tested)	
	Helicoverpa Armigera	**Helicoverpa Punctigera**
Cry1AC	**1.7 (41)**	**0.88 (227)**
Cry 2AB	**0 (23)**	**0 (111)**

F_2 screens for Cry1Ac and Cry2Ab resistance

F_2 screens can detect heterozygote individuals (RS). They involve testing the grandchildren of pairs of moths raised from eggs collected from field populations, and therefore take about 10 weeks to run. Our screens test for genes that confer high level resistance that is likely to be of threat to the industry. **The F_2 screens for Bt resistance in the 2006/07 season are in progress but we have not yet scored any lines for resistance**.

We need your eggs and live large Helicoverpa larvae from Bollgard II plants

The following two one-page briefs outline the need for contributing material to the resistance monitoring programs, as well as the procedures necessary to collect and send samples. Information on resistance frequencies is critical to prolonging the useful life of the important Bt-cotton technology. **Please support us to get adequate samples for a meaningful analysis.**

WANTED: Eggs from Helicoverpa species for resistance monitoring

Helicoverpa armigera is highly mobile. To effectively manage this pest, information is needed across all cotton regions to detect 'hot-spots' of resistance because it might rapidly spread among areas. It is logistically impossible for researchers to collect eggs from such a large area. We therefore rely on dedicated and volunteer collectors, growers, and consultants in each valley to collect and submit eggs for the programs. Small collections from many people require minimal effort and can provide vital information when accumulated across a large area. Collecting eggs can be quick and simple and has

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enormous benefits for the industry. We value collections from Bollgard II® and conventional cotton, as well as other crops including maize, sorghum, pigeon pea and chickpea. If you are based in the Namoi or Gwydir Valleys, we usually are able to respond to alerts promptly (let us know if there is >5 eggs/m). In all other regions we request that the eggs be collected and posted to us.

Five easy steps for collecting and dispatching *Helicoverpa* spp. eggs for monitoring

1. Collect leaves with eggs in fields that have not been sprayed with insecticides toxic to *Helicoverpa* spp. during the previous 7 to 10 days.
2. Ideally, collect at least 100 eggs per field, but **all collections however small are valued**.
3. Leaves from different fields should be placed into separate paper bags. On each bag record: (a) **Date**; (b) **Location**; (c) **Crop** (please distinguish collections from Bollgard II® and conventional cotton); (d) **Collector**; and (e) **Spray History** or **Last Spray** (date and insecticide used). Please include any other information that you consider relevant.
4. Keep eggs alive by storing leaves in paper bags in a fridge or esky with a freezer brick wrapped in paper, and deliver them ASAP to your local IDO, district agronomist or assigned co-ordinator. Alternatively, you could post them yourself to **Sharon Downes and Louise Rossiter, Australian Cotton Research Institute, Wee Waa Road, Narrabri 2390 (ph: 6799 1500)**. We can pay for the postage (i.e. tick the 'receiver pays' option on the freight form). If your property is in the Namoi valley, deliver the material to the ACRI or call Sharon or Louise on 02 6799 1500 to arrange a pick up.

WANTED ALIVE: Large Helicoverpa larvae from Bollgard II® plants

We need to screen more live larvae from Bollgard II® plants!

Reports from 2005/06 suggest that the incidence of live medium or large larvae on Bollgard II® plants is sporadic. Therefore we rely on alerts or collections of larvae from growers, consultants or other interested parties. We are interested in larvae of *H. armigera* and *H. punctigera* that are medium in size or larger (i.e. at least 6mm long). Ideally, the larvae would be accompanied by associated leaf samples but even if you cannot complete step 2 below, your contribution of larvae will be invaluable to the Bt resistance monitoring program. We will distribute containers and bags. Contact us now if you would like some posted to you or your group.

Step 1: Please collect the larvae and place it in a small container with air holes and some food other than Bollgard II® (e.g. conventional cotton).

Step 2: If possible, collect a leaf from the plant that the larvae was feeding on (indicated by the rectangle in Figure 1 on the reverse of this page), as well as the plant in the same row that is either side of the host plant (indicated by the circles in Figure 1), and the plant in the surrounding row that is either side of the host plant (indicated by the triangles in Figure 1). Place the leaf from each plant in a separate paper bag labelled appropriately with 'host plant' or 'surrounding plant', and the plant variety, property, collector, and field, if known, and keep them cool. *Please remove the 3rd unfurled leaf from the top of the plant as the sample.* It is critical that the leaf material is fresh.

Step 3: As soon as possible, call your IDO or arrange to have the larvae or the larvae plus associated plant parts delivered to **Trudy Staines, Australian Cotton Research Institute, Wee Waa Road, Narrabri 2390.** We can pay for the postage (i.e. tick the 'receiver pays' option on the freight form). If your property is in the Namoi valley, deliver the material to the ACRI or call Tracey Parker or Trudy on 02 6799 1500 to arrange a pick up.

We will rear the larvae in the laboratory. All larvae that emerge as healthy moths will be included in the F_2 screens for resistance as part of the Bt resistance monitoring program.

We will also examine the plant samples for the presence of Cry1Ac and Cry2Ab. The four plants surrounding the host are tested in case the grub recently moved from one of them to the current host plant. It is important to keep the leaf from each surrounding plant in a separate bag so that we can tell how many individual plants we sampled but there is no need to indicate which surrounding plant the sample is from.

If you would like a full copy of all results region by region please email me and I will forward on an electronic copy ASAP.