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A detector dog for *Helicoverpa* pupae

Greg Horrocks¹, Floyd¹, Allison Crook¹, David Murray¹, Richard Lloyd¹ and Bruce Pyke²

¹DPI&F Toowoomba, QLD 4350, Australia

²CRDC Narrabri, NSW 2390, Australia

Helicoverpa armigera and *Helicoverpa punctigera*, are the major insect pests of cotton in Australia. Resistance management in *H. armigera* is a high priority issue for both conventional insecticides and transgenic Bt technology (Bollgard® II). Over-wintering pupae represent one of the most vulnerable stages in the life cycle of *H. armigera*, and resistance management efforts have been directed at reducing survival of this stage through the use of 'pupae busting', or full surface disturbance by cultivation to a depth of 10 cm. Pupae busting is mandatory for Bollgard® II crops, and recommended for conventional (non-Bt transgenic) crops.

A male Labrador is being trained to search for and locate *Helicoverpa* spp. pupae. Use of detector dogs could result in better targeted pupae busting operations by identifying fields that pose minimal risk of harbouring over-wintering pupae.

Pupae location



- Most (80%) near plant row
- Average depth 50 mm
- Pupa in chamber at base
- Emergence tunnel to surface



Pupae management



Pupae Busting has problems!

- Cost of cultivating fields
- Wear and tear on implements
- Soil structural degradation
- Loss of soil moisture and opportunity cropping

Current pupal sampling method



- Trowel method
- Time consuming
- Inefficient
- Affected by soil conditions
 - too wet, too dry?
- Low densities hard to sample

Sniffer dog

- Can be trained for purpose
- Detects pupae odours at very low levels (ppm)
- Can cover large areas quickly



Training and calibrating dog against actual field densities of pupae

Future activities

- Assist research investigating resistance management, particularly for Bollgard®II
- Contribute to better targeted pupae busting operations

