

# Plant Entomology

## – Summer 2011

### INTRODUCTION

The Plant Entomology Research Unit conducts research to reduce the effects of insects and related pests on the yield, quality and marketability of plant crops. Major crops targeted include wheat and other cereals, chickpeas, faba beans, canola, citrus, deciduous and tropical fruits, field and greenhouse vegetables, cotton and pastures.

The Unit works closely with the Plant Pathology, Scientific Collections, Forest Health and Diagnostics and Analytical Services Units as well as the Department's plant biosecurity policy, regulatory and extension networks.

Research information from the unit provides a sound science basis for policy decisions by the NSW, Commonwealth and other agencies in plant health science, quarantine and biosecurity areas.

### RESEARCH CAPABILITIES

- » Protect against and respond to exotic or emergency plant pests.
- » Develop integrated pest management options that are required to underpin surveillance, prevention, control or eradication strategies for many plant pests.
- » Develop solutions to reduce pesticide use.
- » Reduce or manage the impact of insecticide resistance in a range of insect and mite pests of agricultural significance using molecular and bioassay technology.
- » Provide molecular systematic research for invertebrate pest identification.
- » Develop and promote environmentally sustainable practices.
- » Improve market access for fruits, vegetables and grains.

### CONTACT US

For more information on our full portfolio please contact Deborah Hailstones, (02)4640 6333 or [deborah.hailstones@industry.nsw.gov.au](mailto:deborah.hailstones@industry.nsw.gov.au)

### PROJECT UPDATES

#### MANAGEMENT OF FRUITSPOTTING BUGS IN TROPICAL HORTICULTURE (2011–2016)

**INTRODUCTION:** Fruitspotting bugs cause significant damage to more than 25 different tree fruit and nut crops and some vine fruits through the coastal and sub-coastal areas of northern NSW as well as elsewhere within Australia. Until now, using broad-spectrum insecticides has been the only management option and this is not sustainable in the longer term.

**FINDINGS:** Field trial results show that alternative control strategies using other plant species as 'trap crops' will reduce damage levels. Several native egg parasitoids have also been identified that will be developed as biological control agents to help reduce pest populations.

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PARTNERS: Horticulture Australia Ltd, DEEDI, University of Queensland, and others



## RESISTANCE TO PHOSPHINE IN INSECT PESTS OF STORED GRAIN (2010–2012)

**INTRODUCTION:** The Australian grain industry relies heavily on the fumigant phosphine to meet market demand for insect-free grain. However, constant use of this chemical has led to the development of resistance in stored grain insect pests. The aim of this project is to monitor storages for the development of phosphine resistance, use the data obtained to develop management strategies, and advise industry personnel on the best practices for insect control.

**FINDINGS:** Resistance to phosphine is common in all five major beetle pests of stored grain. Resistance that cannot be controlled by current fumigation protocols has been detected in *Cryptolestes spp* at several sites, and high-level resistance to phosphine has been found in *Sitophilus oryzae* for the first time. A phosphine resistance management strategy has been developed and adopted by NSW grain growers.



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introduced for onion thrips control in the field, ending the industry's reliance on organophosphates and allowing the development of resistance management strategies.

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**PARTNERS:** Horticulture Australia Ltd



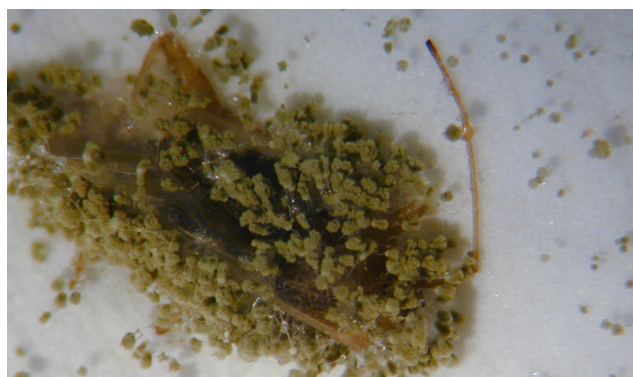
## FUNGAL BIOPESTICIDES FOR MANAGING COTTON PESTS (2010–2012)

**INTRODUCTION:** Despite the adoption of transgenic (Bt) cotton, farmers still face problems with *Helicoverpa spp* developing resistance, and continue to rely on synthetic insecticides to control pests that are not affected by the Bt cotton toxins. This project involves developing entomopathogenic fungi as biopesticides for use against cotton pests. These materials will help minimize synthetic insecticide use in cotton and other broadacre crops, reducing risks to both human health and the environment.

**FINDINGS:** We have developed a new biopesticide (*Metarhizium spp*) effective against sucking pests on cotton and other broadacre crops. Substantial progress has been made in increasing the activity of another fungus for the control of *Helicoverpa spp* on cotton, grains and horticultural crops.

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**PARTNERS:** Cotton Research & Development Corporation, Becker Underwood Pty Ltd



## BEST MANAGEMENT OPTIONS FOR ONION THRIPS IN ONIONS (2007-2012)

**INTRODUCTION:** Onion thrips (*Thrips tabaci*) is a cosmopolitan insect pest of onion. Heavy infestations result in yield loss and reduced marketability of onion bulbs. In addition, onion thrips is the vector of Iris Yellow Spot Virus, a destructive disease of onion crops, and its feeding predisposes onion plants to invasion by fungal pathogens. Until recently, management of onion thrips in onions in Australia relied on a few organophosphate insecticides, which often deliver unsatisfactory results.

**FINDINGS:** A biological control program for onion thrips in stored red onions has been developed and shown to be effective. New chemical options have been identified and

# PIS&R PROJECT UPDATES