

Summer scholarship students make their mark

Many students from various tertiary institutions have been involved in recent projects in the Australian cotton industry. Following are some of the highlights of this “summer” research.

Developing diapause induction and moth emergence tools

David Murray (QDPI&F) and Sandra Deutscher (CSIRO) are supervising Ben Sticklen and Chris Dixon, two former Toowoomba State High School IT students, who are undertaking a project to develop decision support tools for predicting real-time incidence of diapause induction and spring moth emergence from diapause for *Helicoverpa armigera*. The timing of spring moth emergence is important for determining the latest date to carry out pupae busting operations.

Evaluation of habitat assessment tools

Ian Rankine (4T) and Susan Maas (QDPI) are supervising Robin McAlpine, (UNE) to conduct habitat assessments using two different tools at sites where the integrated area wide management project team has previously conducted bird monitoring. Bird species will be used as a biodiversity indicator to determine the effectiveness of these habitat assessment tools for landholder use to assess biodiversity on their properties. These tools would then be trialled at other locations throughout the Emerald Irrigation Area in order to



Back row: Nick Duckmanton, Warren Conaty and James Cheetham. Front: Daniel Tann, Meredith Errington and Ian Rochester.

test their applicability.

Nutrient loss from cotton fields in runoff and deep drainage

Ivan Kennedy and Angus Crossan are supervising Nicholas Duckmanton (University of Sydney) to quantify nutrient loss (N, P, K) in irrigation runoff and deep drainage and relate results to economic and environmental impacts.

This project will benefit the industry by identifying possible routes of nutrient loss, allowing targeted prevention and greater nutrient use efficiency. It will also assist in groundwater and surface water protection.

Their field sites are at Wee Waa.

Genetic variation in tolerance to waterlogging

Greg Constable (CSIRO) and Bruce Sutton (University of Sydney) are supervising Warren Conaty from the University of Sydney. Waterlogging on clay soils has been shown to cause yield reductions amounting to about one bale per hectare per year in Australia through direct effects on photosynthesis and indirect effects on nutrient uptake. It is proposed to make detailed measurements during and after waterlogging cycles over the summer on a wide range of cotton varieties to examine any difference in waterlogging resistance.

Protection of cotton seedlings from Thielaviopsis by microbes

David Nehl (NSW DPI) and Peter McGee are supervising Endymion Cooper (University of Sydney) to test the theory that pathogens can be suppressed by biodiversity.

Effectiveness of foliar nutrition

Lindsay Campbell and Daniel Tann, (University of Sydney), and Ian Rochester (CSIRO) are supervising Meredith Errington. This project will provide information on:

- The uptake of foliar applied potassium, phosphorus and trace elements into the bolls; and,
- The change in yield and quality of crops having had applications of foliar fertilisers.



Back: Sandra Deutscher and Scott Johnson. Front: Dave Murray, Ben Sticklen and Chris Dixon.

HONOURS PROJECTS

Potassium and boron transport into reproductive parts of Bt cotton furrow-irrigated or watered by overhead sprinkler

Longbin Huang (University of Queensland) is supervising James Duddy who will conduct a field experiment which will be carried out on the Duddy cotton farm near Goondiwindi. Cotton plants will be subject to two fertiliser treatments of boron and potassium at flowering and boll-filling.

Sediment and pesticide removal from irrigation tailwater by subsurface filtration

Prof Ivan Kennedy is supervising Mitchell Burns (University of Sydney). Mitchell will gain an understanding of solute transport in porous media, pesticide fate and transport in aqueous systems, and computer simulation and modelling.

Effect of phosphorus fertiliser applications on cotton yield components and fibre quality and AMF (arbuscular mycorrhizal fungi) interaction with P and Zn uptake

Brian Duggan (CSIRO) and Daniel Tann (University of Sydney) are supervising Trent Fraser (University of Sydney). Unpublished data from Kununurra demonstrated not only the importance of P for yield but also on fibre quality. A small pot trial will also determine how dependent cotton plants are on AMF for the uptake of both P and Zinc when grown in soils deficient of these nutrients.

Novel techniques for detecting heat and cold tolerance in cotton

James Cheetham is being supervised by Daniel Tann at The University of Sydney to examine novel techniques for detecting heat and cold tolerance in cotton. He is currently conducting his fieldwork at the Australian Cotton Research Institute.



Brian Duggan and Trent Fraser.



Nick Duckmanton and Ivan Kennedy.

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