

PLAIN ENGLISH SUMMARY

The Kimberley region of Western Australia is one of the most prospective for a significant expansion of the Australian cotton industry into northern Australia. When developed, northern Australian production is estimated to be worth \$750 million annually from a production base exceeding 200,000 ha. However, past failures with agricultural developments in northern Australia have demonstrated the need for in-depth research to identify sustainable cropping and pest management systems to suit the challenge of cotton growing in tropical Australia. The clear lesson from the past is that inadequate understanding of cropping systems and reliance on broad-spectrum insecticides is doomed to failure.

To a large extent, successful industry growth will depend on environmentally acceptable pest management systems based on transgenic varieties. Sustainable cotton production in northern Australia will benefit the existing industry by expanding the production base to make the nation a more reliable and year-round producer of quality lint. The industry will also benefit directly from the IPM developments in northern Australia, which are likely to have applicability to current cotton producers.

Project (AWA.1C) aimed to evaluate the performance of INGARD® varieties grown under several experimental IPM strategies in the Ord River Irrigation Area. Fundamental to all IPM strategies was a shift from summer to winter cropping to avoid peak pest populations and other management problems associated with wet season cropping. To achieve these objectives, paddock-sized plots were replicated on the properties of participating farmers. This large-scale approach to research was necessary to emulate “real” on-farm IPM and was made possible by the establishment of a small gin at Kununurra by Colly Cotton and the Ord River District Cooperative.

The results from the project are very encouraging and have demonstrated the enormous potential for sustainable winter INGARD® production in the Kimberley. The transgenic crops were shown to be efficacious against most lepidopteran pests for a period of around 100 days after planting. In each season fewer than 5 sprays were required for pest control. Yields achieved were around the Australian irrigated average of 7.5 bales/ha. This was a commendable result considering that farmers had no previous cotton growing experience and both agronomic and pest management knowledge at Kununurra was minimal at the commencement of the project.

IPM systems proved to be robust and the use of trap crops such as lucerne and niger increased the number of beneficial insects in adjacent cotton. There was a trend towards higher yield when lucerne strips were deployed alongside cotton as a trap crop. The most important beneficial insect present at Kununurra was the tiny wasp parasitoid *Trichogramma*, which was responsible for parasitising up to 90% of the key pest's (*heliopsis*) eggs.

It is recommended that these encouraging results for IPM cotton at Kununurra be supported by additional research aimed at further developing environmentally friendly pest management systems whilst improving sustainable crop management techniques. The winter growing philosophy has many benefits for pest management but agronomic and pest control methods need to be adjusted through research to ensure that production efficiency is maximised.