

## HORTICULTURE

# IN SUPPORT OF THE BANANA INDUSTRY

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BY DR GIO BRAIDOTTI

Since 1983, ACIAR has supported more than a dozen projects on the production and processing of bananas. When ACIAR started there were just three people working on banana research in Australia. ACIAR's ongoing support has helped to lift Australia to a position of world excellence. This R&D base—particularly on disease diagnosis and the management of pests and diseases—has strengthened Australia's crop protection capability.

This is reflected in the fact that Australia is now recognised as one of the world leaders in research on *Fusarium* wilt disease and on *Fusarium* wilt pathogen diversity. Such advanced capability allowed Australian researchers to identify that the Honduras-bred cultivar Goldfinger is resistant to all races of *Fusarium* and to black sigatoka disease.

Australia now also hosts one of only two indexing laboratories in the world, located at the Indooroopilly Research Centre of the Queensland Department of Agriculture, Fisheries and Forestry.

The laboratory underpins the ongoing monitoring and replacement program that protects Australia from black sigatoka disease. So too the development of diagnostic tests that enable researchers to identify bunchy top disease before its symptoms are expressed in the field. This test was an important step towards providing disease-free material to farmers.

The benefits to banana growers of biosecurity R&D can be considerable. An insect pest such as banana skipper can destroy, on average, 60% of the leaves of infested banana plants. It reached Papua New Guinea in 1983, where it spread at a rate of 500 kilometres per

year and could have reached Australia by 1995.

Instead, the pest was controlled in Papua New Guinea by 1990 through the use of a biological control agent—a small parasite—identified with the support of ACIAR.

The estimated benefits to Papua New Guinea are \$202 million, with 43,000 people lifted above the poverty line through averted income losses and cost increases, according to 2003 estimates.

Benefits to Australia through reduced risk of entry of the insect are estimated at \$223 million. The benefit–cost ratio of this research was independently assessed to be 607:1, from an outlay of \$2.1 million.

ACIAR research also delivered benefits

to postharvest handling technologies.

Examples include the better use of fungicides to control stem end rot and of ethylene to control ripening of bananas under modified-atmosphere storage.

The benefits from this research have been estimated to exceed \$50 million across several countries, with the Australian share estimated at \$6 million.

ACIAR administers the Australian Government contribution to the International Network for Improvement of Banana and Plantain (INIBAP), worth \$200,000 per year, and it too conducts global banana research relevant to Australia, Asia and the Pacific. ■

## MITE PESTS OF HONEY BEES IN THE ASIA–PACIFIC REGION

**ACIAR ACTION** Mite pests of bees are one of the major production constraints facing the apiculture industry throughout the world—except in Australia, the only country free from these pests. The maintenance of effective quarantine strategies is a major aim for Australia, a task assisted by about 15 years of investment in mite research by ACIAR. The outcomes of the research are a good example of the mutual benefits inherent in ACIAR's collaborative research model—in this case, important advances in understanding of mite–bee relationships. These, in turn, have enabled the development of some simple control measures for smallholder beekeepers and important new strategies to significantly improve quarantine procedures for Australia. Included is the discovery that it is possible to eliminate *Varroa* mites from Indonesia given sufficient institutional development. Further, the scientific work underlying these projects has been groundbreaking, leading to one of the most cited scientific papers to come from CSIRO Entomology and to substantially improved understanding of the mites worldwide. Benefits have been estimated at \$72.6 million in total (2007 value) by the Centre for International Economics, with \$161 million accruing to Australia.

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