

## Building a resilient mango industry in Cambodia and Australia through improved production and supply chain practices

### Introduction

Mango production in Cambodia has expanded recently with current estimates from the Ministry and Agriculture Forests and Fisheries (MAFF) stating 24,000 ha of trees in the country (MAFF Report 2010). Mangoes are now Cambodia's second largest fruit crop by volume after bananas (Coconuts not considered). The ACIAR Horticultural Consultation (2012) rated mango as the most important fruit crop, based on its export potential.

Appropriate investment in technology in the early stages of the development of a perennial tree crop, such as mango, yields dividends in later years of fruit production.

The aim of this project is to build fruit research capacity that will assist in the development of a sustainable mango industry in Cambodia and Australia. The project will utilise a systems approach to improve the production practices and quality of mangoes for selected markets.

### Methods

#### Cambodia key activities:

- Introducing new rootstocks varieties
- Improving nursery management practices
- Describing agronomic practices (irrigation, nutrition, canopy management, double cropping)
- Developing a specimen-based mango pest list (arthropod pests and diseases) to meet obligations under the WTO SPS agreement for international market access.
- Developing integrated pest and disease management management systems within a total crop production system
- Understanding existing harvest and fruit quality standards and introduce international assessment protocols
- Describing domestic and export markets
- Building fruit research capacity.

#### Australia key activities:

- To understand the function of the FT gene during the expression of flowering and incorporate these techniques to understand crop management
- To achieve successful on farm adaptation of biocontrol agents for fruit-spotting bug in sub-tropical tree crops.





*Collections of insects held in GDA.*



*Serious pests in Cambodia that could be a threat in Australia have been identified.*



*Regional workshops on insect pests and diseases have been held in four provinces.*



*Loading PCR products for agarose gel electrophoresis.*



*Mango flushes on application day (left) and four weeks (right) after applying with low concentration of ethephon (T2: 0.5 ml of 72% ethephon/L water).*



## Outcomes

This project is building the research capacity of Cambodia institutes to support fruit production. It has also identified potential pest threats for the Australian mango industry and assisted in developing new ways to detect floral initiation in mango.

- Training was provided on the preparation of specimen based pest lists. This included survey methods, collection, preservation and curation techniques, diagnostics and verification. The training was provided in a number of workshops including three on diagnostics using DNA.
- Pest lists have been developed by collaborators from CARDI, Royal University of Agriculture (RUA) and the General Directorate of Agriculture (GDA). These pest lists meet requirements of the SPS agreement for international market access and also facilitate determination of the most important production pests.
- Farmer workshops have also been conducted in four provinces to train the participants to recognise the more important pests and diseases.
- Training in the collection of high quality images has been provided as part of the development of a quality assessment manual showing many of the common defects of mangoes in Cambodia and an insect pest and disease field guide.
- Training on nursery practices, the mango phenological cycle and supply chains has been provided.
- The management of flushing in Cambodian mangoes with ethephon has been investigated.

