

# Horticulture

## – Winter 2011

### INTRODUCTION

Industries supported by NSW DPI Horticulture Research Unit produce fruits, nuts, vegetables and oils with an annual gross value of approximately \$AUD 1.3 billion. The unit is also proactively involved in the development of emerging industries based on commodities such as Asian vegetables. The unit develops and improves sustainable production systems and underpins effective market access through quality assurance systems that deliver consistently high quality and safe produce. The unit supports NSW's diverse horticultural industries by providing research on:

- » sub-tropical horticultural crops such as macadamias, custard apples, mangoes, blueberries and bananas;
- » nutritional management of covered (greenhouse); crops and Asian vegetable crops;
- » production and chemistry of edible oils;
- » nutrient and water management systems for commercial citrus production;
- » improved postharvest and production chain systems for fruit and vegetables;
- » evaluation of germplasm including new citrus varieties and rootstocks for high quality fruit production and adaption to adverse soil and climate conditions;
- » production of improved tea tree varieties.

### RESEARCH CAPABILITIES

- » Teams of horticulture researchers are based at six centres: Alstonville (sub-tropical fruit), Dareton (citrus), Gosford Horticultural Institute (greenhouse, postharvest), Wagga Wagga (edible oils), Wollongbar (tea tree) and Yanco (vegetables).
- » Each centre provides field, laboratory and green house facilities. In some cases centres provide substantial orchards and other perennial plantings.

### CONTACT US

For more information on our full portfolio please contact Shane Hetherington (02) 6391 3860 or [shane.hetherington@industry.nsw.gov.au](mailto:shane.hetherington@industry.nsw.gov.au).

- » An internationally recognised oil testing service supplemented by the country's only olive oil tasting panel based at The Australian Olive Laboratory (Wagga Wagga)
- » Greenhouse facilities at Gosford Horticultural Institute including development of best-practice climate control, hydroponic and Integrated Pest Management (IPM) strategies to support this rapidly developing sector. The pending co-location of this facility at the University of Newcastle Ourimbah campus will enhance existing collaboration in this research field through enhanced access to staff, students & facilities.
- » A long-term international presence through co-location of staff at the Vietnamese Academy of Agricultural Science and other substantial research commitments in Pakistan, Bhutan and PNG.

### PROJECT UPDATES

#### OLIVE OIL STABILITY & SHELF LIFE (2008–11)

**INTRODUCTION:** Australian olive growers aim to produce olive oil of the highest quality. However the chemical and sensorial quality of the olive oil declines over time due to ageing and storage conditions. In this project, a number of olive oils have been stored in different conditions (different temperatures, exposure to light, exposure to oxygen). The oils have been analysed for chemical and sensory quality regularly over 24 months.

**FINDINGS:** Quality olive oils with high levels of antioxidants and low polyunsaturated fatty acids store better. Shelf life can be further enhanced by storage in a cool, dark place. This research produced guidelines which will maintain Australian olive oil's reputation as a premium product.



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**PARTNERS:** Rural  
Industries & Investment  
Corporation (RIRDC),  
Aust Olive Association

## TEA TREE BREEDING PROJECT (2009–2014)

**INTRODUCTION:**The use of higher yielding varieties through genetic improvement is one proven path to higher efficiencies of production and this was recognized by the Australian tea tree industry in 1993 when the Australian Tea Tree Industry Association and RIRDC funded the first of five (1993/96, 96/01, 01/06, 06/09, 09/14) consecutive tea tree breeding projects.

**FINDINGS:** This work has led to an industry-wide 70-80% improvement in oil yield in less than two decades. The product's quality has also been drastically improved. NSW DPI research has produced sufficient seed to plant over 1500 Ha of trees, providing vital support to the emerging Australian tea tree industry.



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**PARTNERS:** RIRDC, Australian Tea Tree Industry Association

## NUTRIENT MANAGEMENT OF ASIAN VEGETABLES (2009-2011)

**INTRODUCTION:** Since the 1990's the Asian vegetable sector has been growing rapidly (19% for the period 05/06 – 07/08) and is worth \$204 million. This sector is largely based in peri-urban agricultural areas in the Sydney Basin. Continued investment in the industry is reflected in the recent move towards hydroponic production of leafy Asian vegetables. These systems are highly efficient in the use of water and nutrients but only if they are managed according to the needs of the crop, which are yet to be determined for leafy Asian vegetables.

**FINDINGS:** Asian vegetables are often 'over-fertilised'. This research established fertiliser rates and application techniques for hydroponic production which optimise crop performance while having a low environmental footprint and eliminating human health concerns associated with dietary nitrate accumulation. Tailored techniques for ten Asian vegetable crops have now been developed allowing farmers to apply fertilisers wisely.



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**PARTNERS:** Horticulture Australia Limited (HAL)

## PROMOTING THE USE OF INDIGENOUS VEGETABLES BY WOMEN IN VIETNAM AND AUSTRALIA (2008–2012)

**INTRODUCTION:** How do we bring about change in the marketing and production of indigenous vegetables? To address this, the project has looked to develop models that enable a competitive market position for smallholder women farmers in a transforming market. The Australian component follows similar themes.

**FINDINGS:** Current marketing practices have been documented and changes are being trialled to simplify trade and deliver greater returns to female farmers and their families. Through Farmer Business Schools women are being taught to produce better crops and market them more profitably. This work facilitates the introduction of new crops to Australian agriculture.

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**Funding Provider:** Australian Centre for International Agricultural Research (ACIAR)

**PARTNERS:** Vietnam Women's Union (VWU), Vietnam Academy of Agricultural Sciences (VAAS), Field Crops Research Institute (FCRI), National Institute of Medicinal Materials (NIMM), Centre for Agrarian Systems Research and Development (CASRAD), Plant Protection sub-Department – Lao Cai (PPsD), Plant Protection sub-Department – Phu Tho (PPsD).

## ASSESSING THE HORTICULTURAL PERFORMANCE OF NEW CITRUS ROOTSTOCKS VIA SHORT-TERM ORCHARD TRIALS (2007–13)

**INTRODUCTION:** Citrus rootstocks influence fruit yield and quality as well as conferring desirable traits such as heat, drought and salt tolerance. This project is examining the performance of a range of rootstocks derived from PR China and Vietnam and promising disease resistant, salt tolerant rootstock hybrids bred by CSIRO.

**FINDINGS:** Rootstocks from this trial are able to maintain production when grown in regions with extreme climates. This work will produce rootstocks which will allow the Australian citrus industry to adapt to the higher temperatures and reduced water availability associated with climatic variability.



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**PARTNERS:** HAL & CSIRO

# PIS&R PROJECT UPDATES