

## Keeping cool pays dividends

Dear Reader,

Our business is taking science and making it practical and applied for Northern Territory agribusiness. In this issue we address the perennial problem that confronts our burgeoning Asian vegetable industry in the Northern Territory i.e. getting produce cool and keeping it that way whilst in transit to markets in southern Australia. Extension Officer Stuart Smith addresses this topic and provides some practical post-harvest management advice to NT vegetable growers.



Proving that there is more to life than eating (apparently), Doris Marcsik gives us an outline of what is happening in the amenity side of NT horticulture. We currently have two national funding agencies investing in our NT flower industry and this will translate into access to new germplasm for this sector.

Finally, a 'heads up' on a devastating new weed that has entered Australia, and a call to be on the lookout for it.

Getting the right information is the foundation for making the right agri-business decisions at a given time. Please check out the useful links and our upcoming events section. I hope this information is of practical use to those engaged in NT horticulture.

Regards,

Warren Hunt

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The PINT Newsletter is produced by the Plant Industries Division of Department of Resources.

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## Looking for a cool change: Post-harvest management for Asian vegetables

By Stuart Smith

Optimal post-harvest treatment of vegetables is a critical component of the value chain for any vegetable crop. Hard earned investment and effort can all be in vain if effective and timely practices are not employed to maintain vegetable quality. This is particularly important for Northern Territory growers who have the majority of their markets situated at great distances in southern Australian centres. The following article will focus on the critical control points to maintain the quality of Asian vegetables until they reach southern destinations.

### From field to packing shed

- 1) Harvest in the coolest hours of the day (i.e. mornings).
- 2) Whilst still in the field, ensure that harvested bins of vegetables are held under shade or covered with reflective foil blankets.
- 3) Dispatch vegetables to the packing shed (every 1 – 2 hours).
- 4) A cool bath (Figure 1.) or wash system can aid in lowering vegetable core temperatures prior to packing and placement in cool rooms.
- 5) If your cool room is not big enough – get more cool room space.
- 6) Golden rule – unless it is at the correct storage temperature (Table 1), do not load it. You cannot rely on your vegetable consignments to cool on the truck to the market.
- 7) Consider new technology e.g., vacuum driers for faster cooling of produce.
- 8) Vegetables should go straight from the cool room to the truck. The optimal is when the vegetables can be loaded into the truck from the cool room i.e. there is a docking station or loading platform.

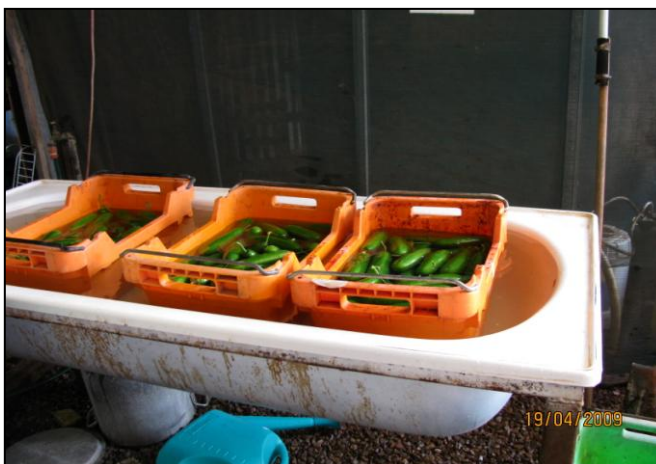


Figure 1. Simple but workable - cucumbers in a cool water bath.

### Juggling vegetables

- 1) Problems can emerge with vegetable quality when they are transported with mangoes. The reasons for this are:
  - a) During the peak of the mango season vegetables often compete for cool room space, and consequently they may not always be at the right storage temperature at loading for interstate transport.
  - b) Vegetables may be consigned with mangoes, which will be at transported at incompatible storage temperatures to most of Asian vegetables (Table 1). Note - mangoes are ideally cooled and transported at 12-14°C.

	Temperature	Packaging	Shelf Life
Bitter melon	5 °C	Paper wrapping	3 weeks
Okra	10°C	Plastic bag	3 weeks
Sinqua	5°C	Any	2.5 weeks
Snake beans	5 - 10 °C	Plastic bag	2.5 weeks
Kang kong	5°C	Plastic bag	2 weeks

Poor packing technique can also lead to problems in terms of allowing airflow through a consignment - either in the cool room or in transport. It can also lead to gross physical damage of vegetables further downgrading quality (Figure 2).



Figure 2. Poorly packed NT vegetables in the Sydney markets

*Transport temperatures  
The Good vs the Bad & Ugly*

Figures 3 to 6 demonstrate the effect of optimal versus poor temperature management with Asian vegetables out of the NT. They detail two separate consignments of snake beans that were consigned this year to the Sydney markets. The first (Figures 3 & 5), represent a consignment with well managed temperatures enroute, whilst the second (Figures 4 & 6), demonstrate poor temperature management.

Figure 3. Temperature log of well-managed snake beans from transport consolidator to Sydney wholesaler

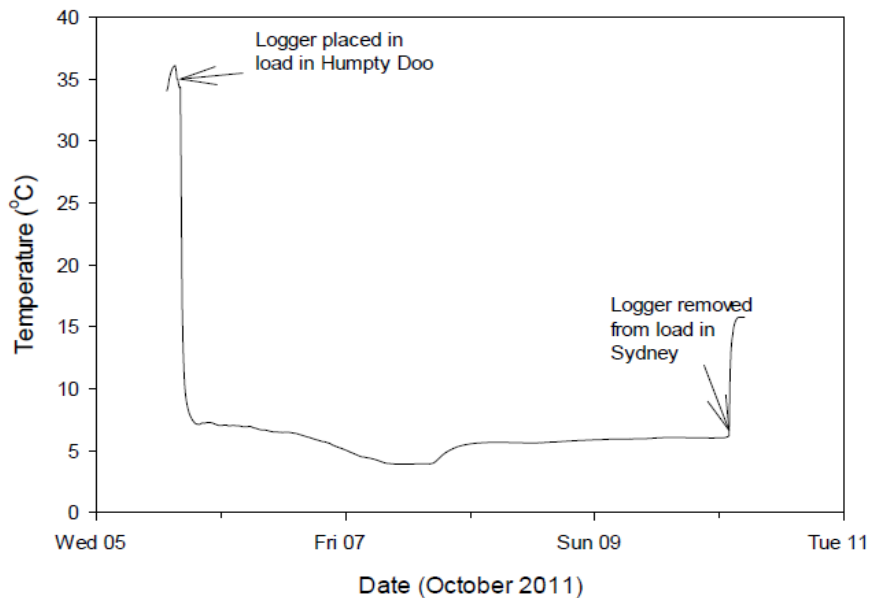


Figure 4. Temperature log of poorly-managed snake beans from transport consolidator to Sydney wholesaler

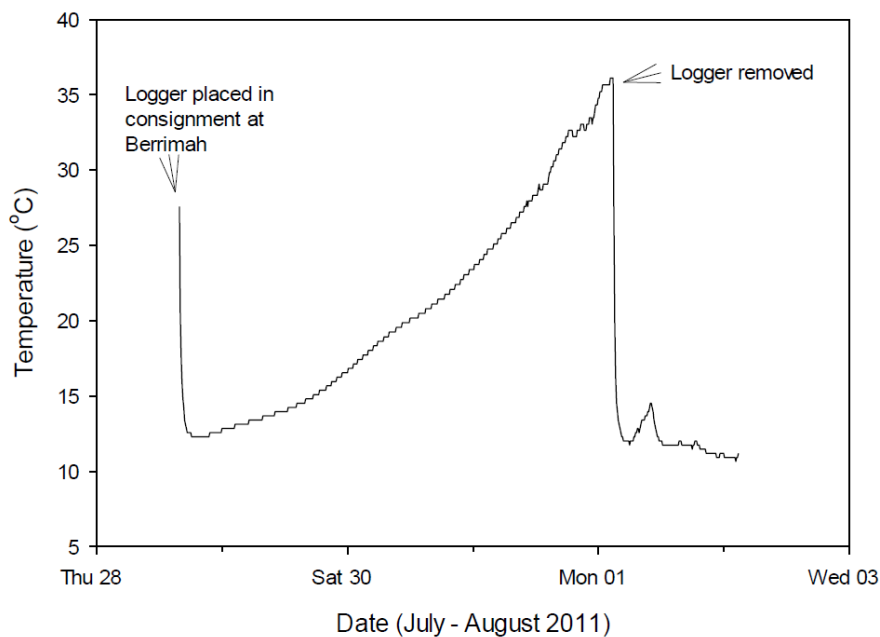




Figure 5. Good snake beans in first class condition at the Sydney markets



Figure 6. Bad & Ugly snake beans condemned at the Sydney markets as consequence of poor temperature management

For more information on post-harvest management of vegetables in the NT call or email Stuart Smith mobile: 0428 966 528; or email: [stuart.smith@nt.gov.au](mailto:stuart.smith@nt.gov.au)

## Tropical floriculture research and development

By Doris Marcsik

Two innovative projects will soon be making their mark in tropical floriculture. The NT Department of Resources (NT DoR) and the University of Queensland have partnered with collaborators in Fiji, Papua New Guinea, Solomon Islands and the NT Aboriginal Bush Traders group, who will work with Indigenous communities. The project aims to improve the livelihoods of communities through amenity horticulture. It is funded by the Australian Centre for International Agricultural Research (ACIAR). NT DoR's focus will be on research and development to determine best practices for cut-flower production with *Zingiber* and *Alpinia spp.* It will also exchange germplasm, and identify new germplasm from the Pacific Island Countries that might have commercial floriculture potential in Australia. Another feature of the project is that it will identify and develop Northern Australian native species with commercial potential. The project has, in its first year, conducted value chain and market analysis studies in both Fiji and the Solomon Islands to identify constraints and opportunities for indigenous enterprise development using floriculture. It has also recovered and increased germplasm of ornamental gingers and heliconias bred and developed by NT DoR for exchange with collaborators.



The second initiative is a three year Rural Industries Research Development Corporation (RIRDC) funded project focused on production systems for ornamental gingers. The program will:

1. Investigate and develop baseline production protocols for growing new varieties of ornamental ginger flowers for domestic and export markets. Note - collection of new *Curcuma* accessions and inter-specific *Zingiber* hybrids developed by the NTDoR have already been identified for this trial.
2. Develop practical systems for rhizome storage and production.
3. Establish benchmarks for optimum light conditions and use of plant growth regulators.
4. Determine nutritional requirements to produce uniform, high quality ginger flowers.

5. Provide growers with increased knowledge and skills on effective techniques for growing *Curcuma* and specific *Zingibers* in a closed system; and,
6. Deliver the amenity horticulture industry with new *Curcuma* flowering material.

The NTDoR is currently inviting growers who are interested in participating in the project, or who would just like further information to contact Doris Marcsik on (08) 89 992017 or e-mail [Doris.Marcsik@nt.gov.au](mailto:Doris.Marcsik@nt.gov.au)

### Weed alert – Tropical Soda Apple (*Solanum viarum*)

*By Professor Jeff Mullahey, West Florida Research and Education Centre*

The following is part of a nation-wide alert for combating this most devastating weed.

Tropical soda apple (*Solanum viarum*) is a native of north eastern Argentina, south eastern Brazil, Paraguay and Uruguay. Tropical soda apple is a prickly perennial shrub that aggressively invades pastures, forests, riparian zones, roadsides, recreational areas, and horticultural and cropping lands. It reduces biodiversity by displacing native plants and disrupting ecological processes. Its foliage is unpalatable to livestock. Prickles on this plant restrict native animal and stock grazing and can create a physical barrier to animals preventing movement to shade and water. The plant is a host for many diseases and pests of cultivated crops and it contains solasodine, which is poisonous to humans.

Tropical soda apple was first recorded in Florida, USA in 1987 and was known to infest 10,000 ha by 1990 and 500,000 ha by 1995. By 2007 it had spread to nine other states in south eastern USA. In the USA it is a Federal Noxious Weed aptly named: ‘the plant from hell’. Tropical soda apple has also naturalised in Africa, India, Nepal, West Indies, Honduras and Mexico and outside its native range in South America. Tropical soda apple was first identified in Australia in the Kempsey area on the Mid North Coast of New South Wales (NSW) in August 2010. However, this weed is believed to have been present in this area for a number of years.

The current extent of the first known infestation in Australia is about 50 ha. Subsequent surveys have identified smaller infestations in surrounding areas, including Wingham and Grafton.



#### Identification:

- Tropical soda apple is an upright, branching perennial shrub growing to 2 m tall.
- It has broad based straight cream coloured prickles to 12 mm on most plant parts.
- Leaves are mostly 10–20 cm long and 6–15 cm wide.
- The upper and lower leaf surfaces are densely covered in short hairs; mid-veins and primary lateral-veins are cream coloured on both sides of the leaves.
- Flowers are white, with 5 petals 2–4 mm long.
- Flowers occur in clusters of 3–6 off a short stem.
- Mature fruit are yellow and golf ball size (20–30 mm in diameter).



- Immature fruit are pale green with dark green veins, like immature water melons.

Tropical soda apple reproduces via seed and can regenerate from root material. In NSW cattle movement is likely to be the major vector of spread. Seed can also be spread by feral animals and birds that feed on the fruit, and via water and contaminated produce, soil and equipment.

Individual plants can be manually removed, but care must be taken to remove all the root material, as plants will regrow from root fragments. The herbicide fluroxypyr (e.g. Starane®) is recommended for control and allowed under the APVMA permit PER9907 which expires on the 31 March 2012.

The tropical soda apple information can be sourced from NSW Primary Industries website:  
[www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/tropical-soda-apple](http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/tropical-soda-apple)

Photographs are credited to Industry & Investment NSW (I&I NSW):  
[www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/tropical-soda-apple/tsa-image-gallery](http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/tropical-soda-apple/tsa-image-gallery)

**If you see this plant in the NT contact:**

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## Useful Links

APVMA – Public Chemical Registration System  
<http://services.apvma.gov.au/PubcrisWebClient/welcome.do>

APVMA Permits  
<http://www.apvma.gov.au/permits/search.php>

APVMA – Dimethoate Review  
[http://www.apvma.gov.au/news\\_media/news/2011/2011-08-22\\_dimethoate\\_review.php](http://www.apvma.gov.au/news_media/news/2011/2011-08-22_dimethoate_review.php)

Bureau of Meteorology services

- Weekly climate note  
<http://www.bom.gov.au/climate/tropnote/tropnote.shtml>
- Madden-Julian Oscillation  
[www.bom.gov.au/climate/mjo](http://www.bom.gov.au/climate/mjo)

Horticulture Publications – DAFWA  
[http://www.agric.wa.gov.au/PC\\_91713.html?s=505199810](http://www.agric.wa.gov.au/PC_91713.html?s=505199810)

Mango Information Kit  
<http://era.deedi.qld.gov.au/1647/>

NT Primary Industries Agnotes and Fact sheets  
[http://www.nt.gov.au/d/Primary\\_Industry/index.cfm?Header=Agnotes%20and%20Factsheets](http://www.nt.gov.au/d/Primary_Industry/index.cfm?Header=Agnotes%20and%20Factsheets)

Primary Industries Publications – NT DoR  
<http://www.nt.gov.au/d/publications/>

## Upcoming Events

### **Mangoes:**

1. Formation of Mango industry small group networks (Darwin and Katherine), February 2012.
2. Annual mango pre & post-harvest disease management workshops. Darwin & Katherine February - March 2012.
3. Annual 'Superior mango rootstocks' farm walks – April 2012.
4. Irrigation best-practice water use and nutrient efficiency workshops for NT mangoes. Darwin & Katherine – dates & venues to be advised

### **Fodder industry:**

Workshops at 4 x locations:

- Barkly
- Katherine
- Douglas-Daly
- Darwin

Dates to be advised in 2012

#### **Disclaimer**

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