Advances in mango production: 2019

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Plant Industries Branch
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Activities and partners

• Nitrogen and calcium (MpfN and ACIAR)
• Resin canal (UTAS/ARC/Woolworths)
• Dieback (Grower collaborators)
• Flower manipulation (ACIAR/HIA/NESP/Grower collaborators)
• Quality (Corporate partners/ACIAR)
Early history of the Northern Territory mango industry

Hobby farms, 1980

Production systems

Grower Bodies

South-east Asian growers

Corporate/New Varieties

Consumer focus

Rationalisation

1,854t

30,373t
Nitrogen and calcium

• Key nutrients for mango yield and fruit quality

• Nitrogen is both phloem and xylem mobile

• Calcium is non-phloem-mobile
Nitrogen and calcium

**Nitrogen**
- 250 tree/ha
- 6kg/ha KNO₃
- Additional N applied as ammonium sulphate
- Applied after harvest and during active growth
- Fruit harvested 2-18th Oct 2018
Nitrogen and calcium

Calcium

- Non-phloem-mobile
- Present in litter
- Baseless recommendations and products
- Monitoring relocation in pot trials
Resin canal discolouration

- RCD is an infection
- Infection can occur at all stages of the supply chain
- May be transmitted by handling fruit
- Difference between Darwin and Katherine
- Not all cultivars susceptible
- **Still need to know:**
  1. Mode of infection
  2. Source of inoculum
  3. Control measures
  4. Managing cross contamination
- Training for growers, packers, transporters and marketers
Dieback

- Mapped locations
- Isolated candidate fungal and bacterial pathogens
  - Verifying pathogenicity
- Developed communication strategy
  - Newsletter
  - Engaged with chemical suppliers
  - Partnered with grower bodies
- **Looking to industry to prioritise**
First samples collected in Darwin - 15 June 2018
Field survey - 21 November 2018

Subsequent surveys
18 December
16 January
8 February
18 March
Quality

Using Non-destructive near-infra technology to investigate mango quality

• Reassessing industry standards of dry matter and brix
• Understanding relationship between brix and lenticel development
• Understanding the effects of gamma irradiation on fruit quality
• VHT control of stem end rot
There is more to mango maturity than 15% dry matter and 14° brix to get repeat purchases.

Both 50:50 > 14°Brix
Irradiation and lenticels

Consistent with Ainsworth (2016) on KP
VHT and percentage disease incidence

PDI % of Keo Romeat fruit with body or stem end rot across export fruit treatments in Phnom Penh, Cambodia

- Control
- Transport to VHT facility
- VHT no storage
- Transport, VHT and Store

Fruit treatment

- Stem End Rot
- Body Rot

www.nt.gov.au
National mango breeding program cultivars

- Outstanding performers (for irradiation, colour, yield, flavour)
  - Maybe issues with 1201
  - Harvest date
  - Yield data
## NMBP harvest dates and yields Katherine: 2018

### Main effect of scion on mean fruit yield

<table>
<thead>
<tr>
<th>Harvest Date</th>
<th>Scion (Variety)</th>
<th>N</th>
<th>Yield (kg/tree)</th>
<th>Yield (t/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4(^{th}) October</td>
<td>1243</td>
<td>30</td>
<td>29.5 (^{c})</td>
<td>5.3 (^{c})</td>
</tr>
<tr>
<td>23(^{rd}) October</td>
<td>1201</td>
<td>30</td>
<td>60.5 (^{b})</td>
<td>10.8 (^{b})</td>
</tr>
<tr>
<td>1(^{st}) November</td>
<td>Kensington Pride</td>
<td>30</td>
<td>26.0 (^{c})</td>
<td>4.6 (^{c})</td>
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<tr>
<td>7(^{th}) November</td>
<td>B74</td>
<td>36</td>
<td>77.3 (^{a})</td>
<td>13.8 (^{a})</td>
</tr>
<tr>
<td>12(^{th}) November</td>
<td>4069</td>
<td>31</td>
<td>73.7 (^{ab})</td>
<td>13.2 (^{ab})</td>
</tr>
</tbody>
</table>

Within a column, means with common letters are not statistically significant by Tukey’s HSD\(_{0.05}\)
Hang time of developing fruit: 2017

**On tree flesh firmness (Newton)**

**On tree dry matter (%)**
Flower manipulation

- Precise definition of inductive conditions
- Effects of high PBZ
- Case study with NESP on impacts of Climate Change
- Change of use of registered chemicals
Mango flower induction high minimum and maximum temperature and cultivars have different thresholds

![Diagram showing the relationship between temperature and percentage flowering shoots for different cultivars.](https://www.nt.gov.au)
Summary

• Customer focus
• Integrated specialist team
• Regional, National and International relevance
• Addressing high priority industry problems
• Delivering outcomes that are adopted by research partners
• Building capacity while performing research
Thank you

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