

More Profit from Nitrogen



Optimising nutrient management for improved productivity and fruit quality in mangoes

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Australian Government
Department of Agriculture
and Water Resources

Horticulture
Innovation
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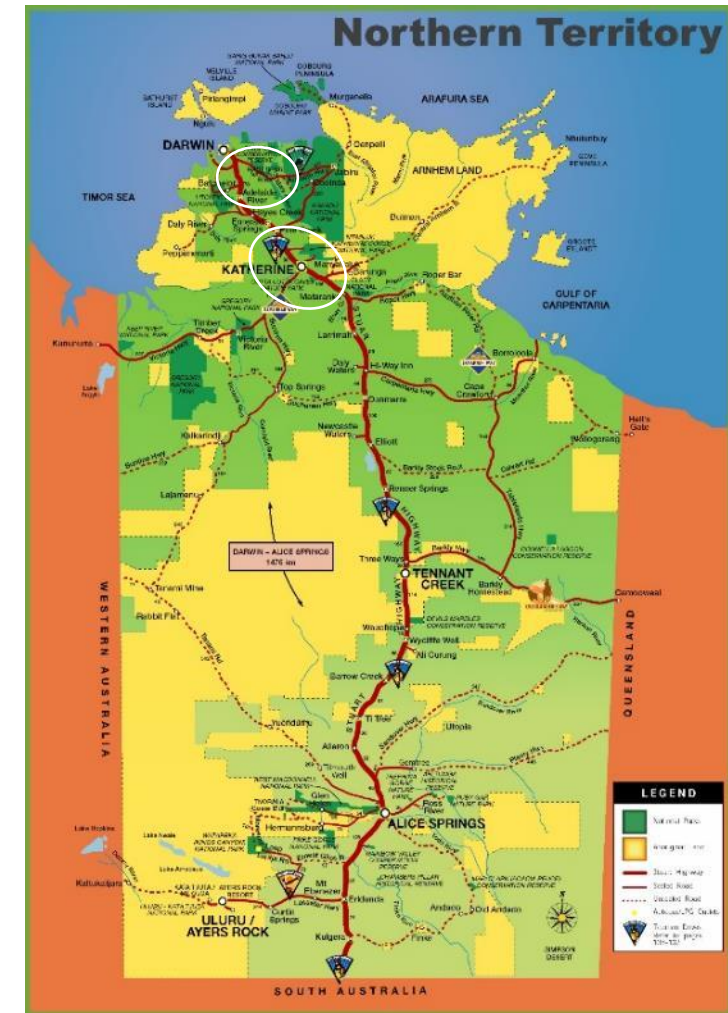
AUSTRALIAN
MANGOES



QUT
Queensland
University
of Technology

MPfN-mangoes

- Significant, expanding industry in NT
 - 42,000 tons/year
 - ~50% of total AU mango crop
 - \$ value
- Climate and soil differences compared with QLD
 - Not all management practices are transferrable
- Extreme variations in NT orchard management
 - Few evidence based recommendations



MPfN-mangoes

Questions?

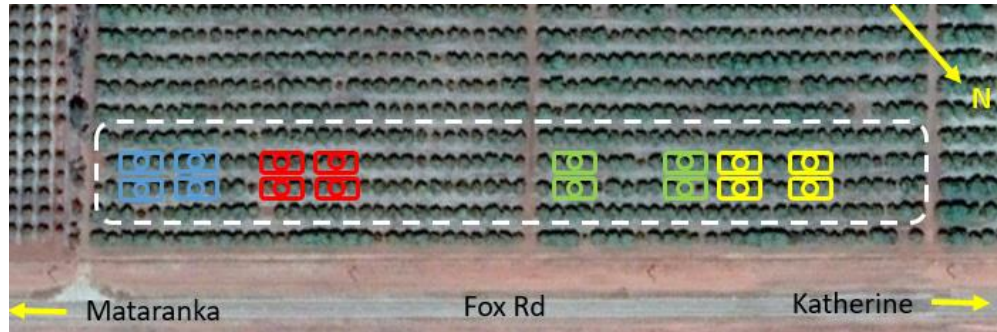
- What is the local N budget for mangoes?
 - N taken up?
 - N recycled?
 - N lost to environment?
- Litter management
 - Source of nutrients?
- How much N is too much?
 - Impacts on fruit?



MPfN-mangoes

How much N is too much?

- Treatments: 0, 12.5, 25, 50 kg N/ha
- Nitrogen in disguise
 - Bio-amendments
 - KNO_3 at flowering
 - = ~6 kg/ha/year



MPfN-mangoes

NUE soil applied N

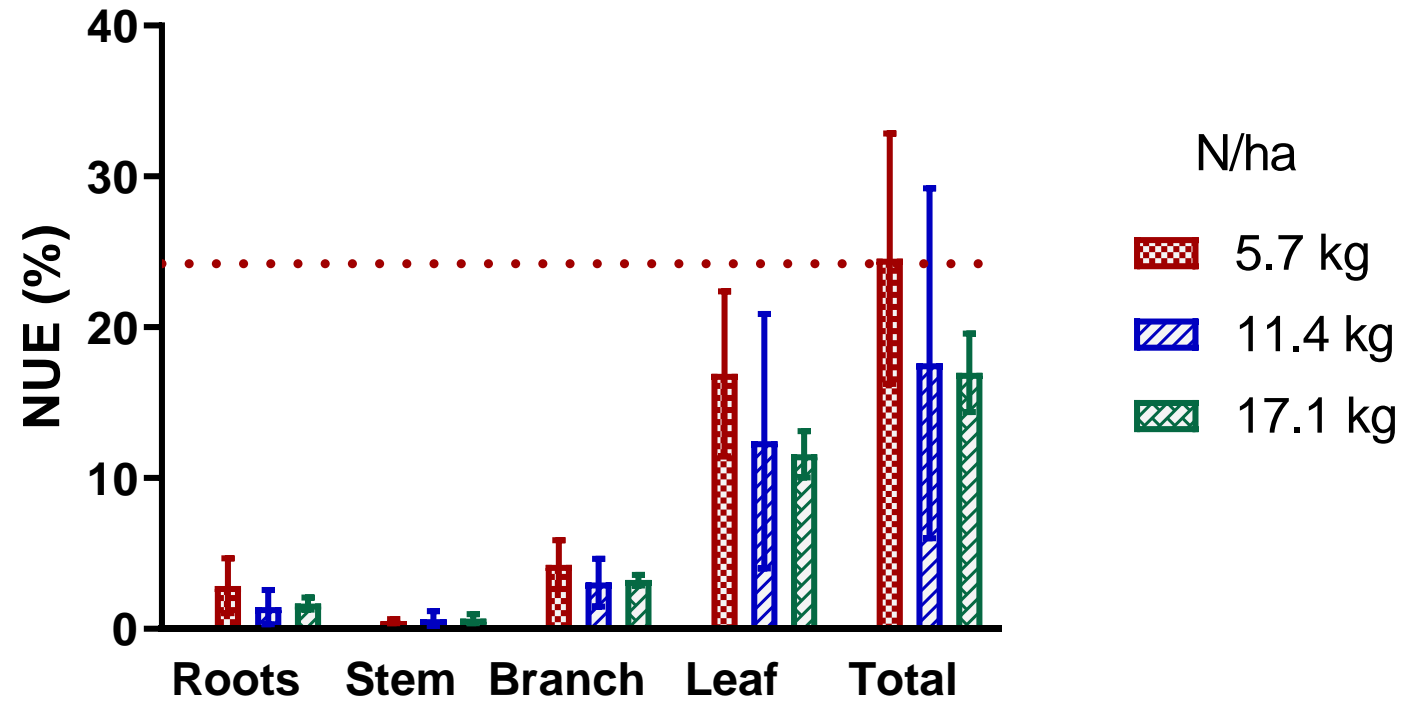
- Multi-year trial
- ^{15}N labelled $(\text{NH}_4)_2 \text{SO}_4$
- ~25% NUE at 5.7 kg/ha
- 1.5 kg N/ha uptake

Annual N cycling *in planta*

- ^{15}N *in planta* + litter
- $\frac{3}{4}$ complete

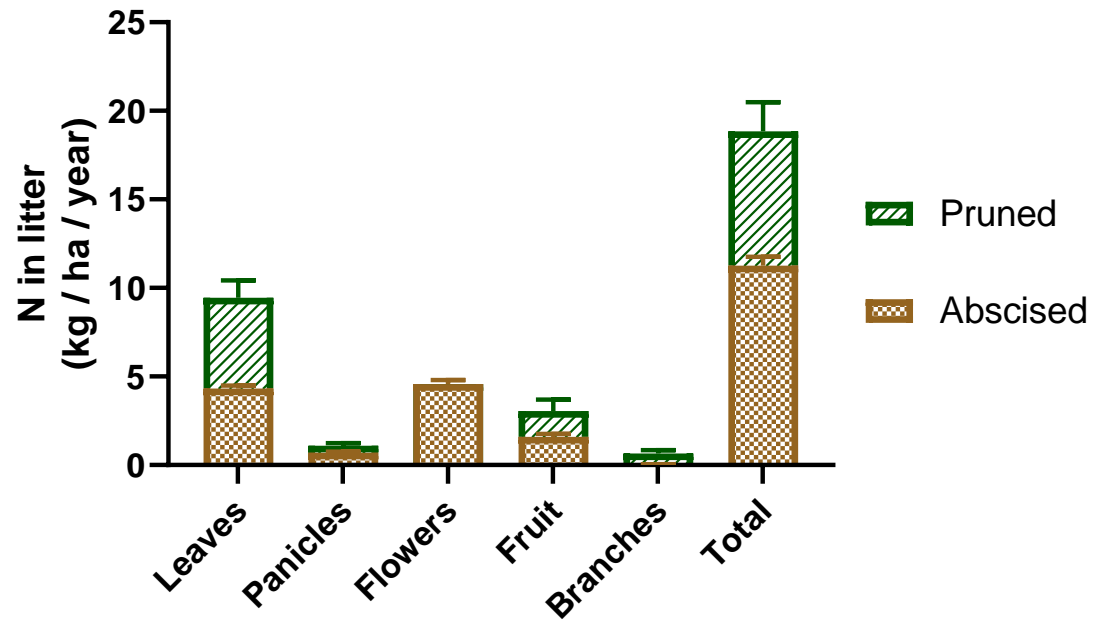
Leaf N uptake- KNO_3

- Dip in ^{15}N solution
- 5 varieties
- Data pending

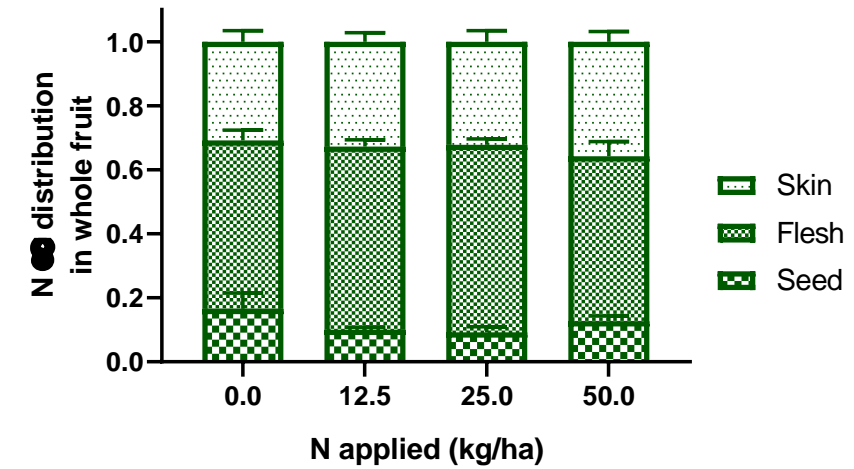
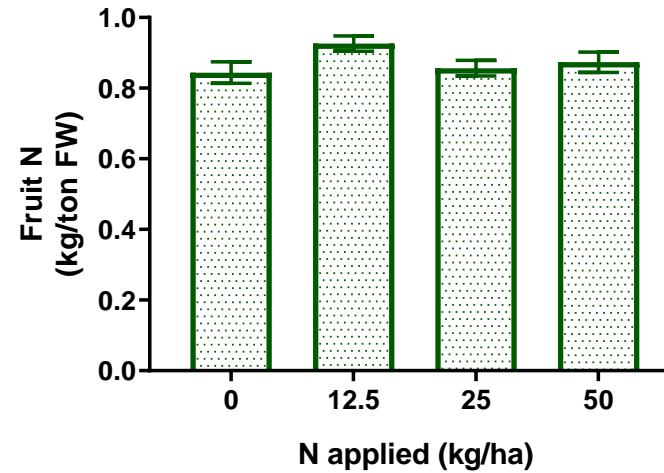
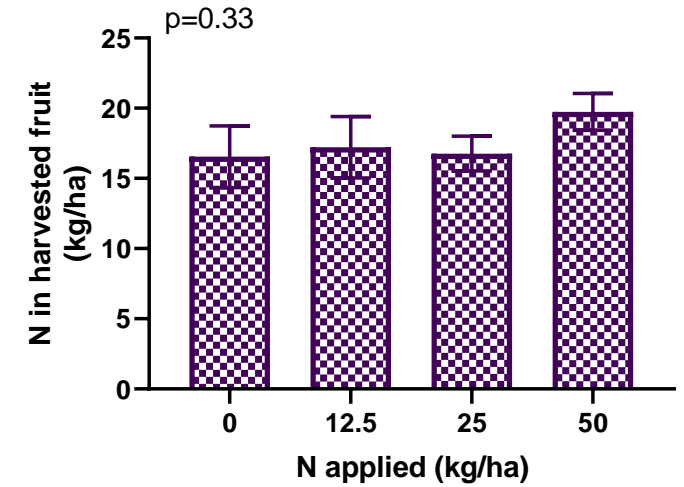
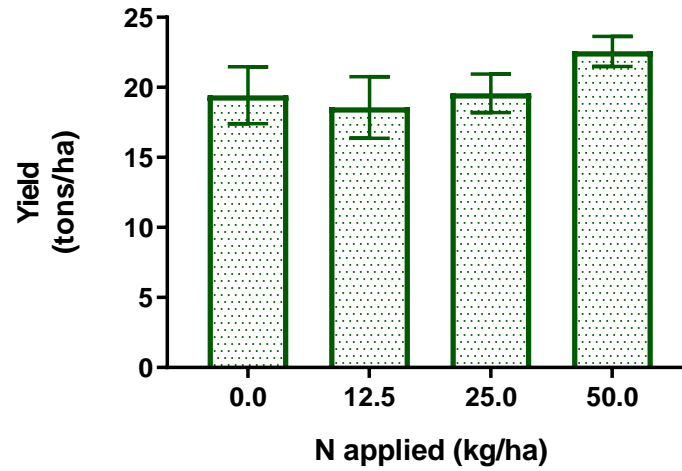


MPfN-mangoes

Annual litter cycling -15-20 kg/ha/year



MPfN-mangoes



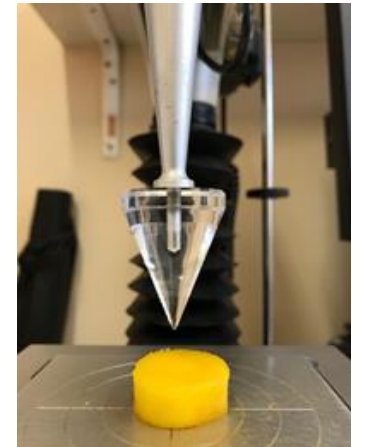
MPfN-mangoes

No significant differences

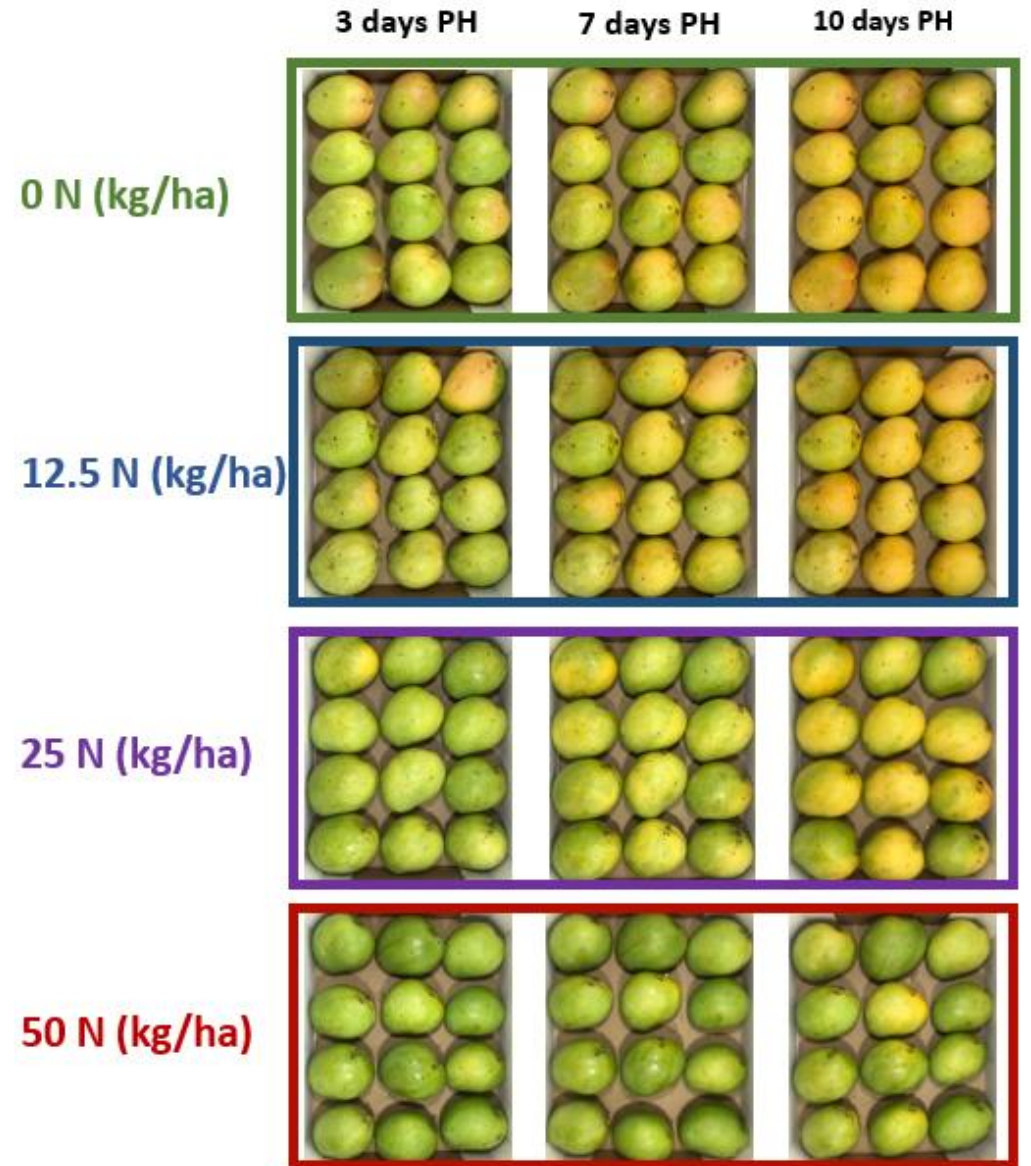
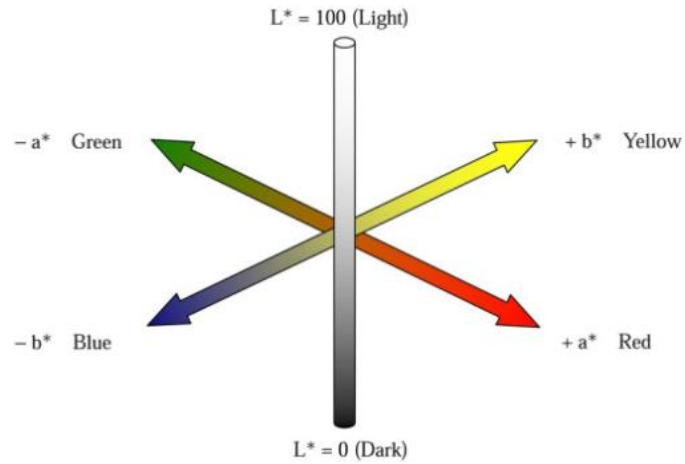
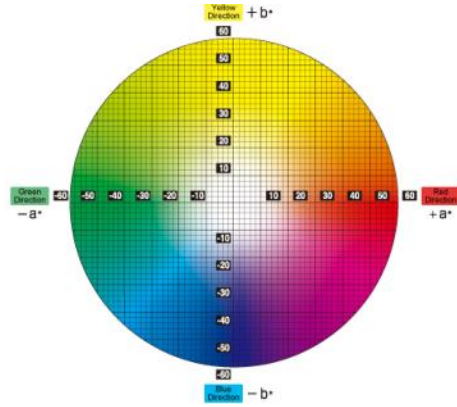
- Harvest yields
- Fruit % dry matter (NIR)
- Juice ° Brix
- Flesh texture
- Flesh colour
- Fruit N content
- ↑ trend in 'soft nose'

Significant difference

- Skin colour-ripening over time



MPfN-mangoes



Effect of mulch on soil structure

Mango litter removed (>12 months)



Surface sealing

Rain splash

12 month old litter



Soil under litter



Aggregation

Coastal Plains Research Station