

Optimising nutrients – nitrogen in mango systems of the NT

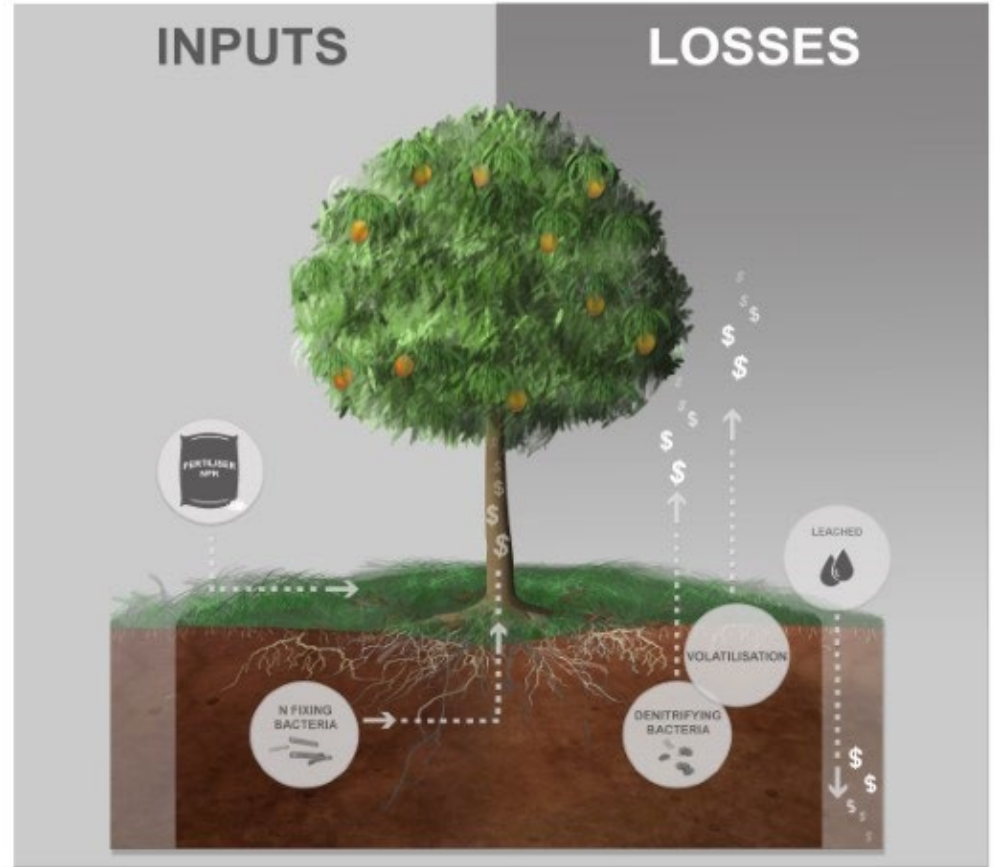
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More Profit from Nitrogen

Focus on five key areas –

- **Crop N uptake**
- **Recycling**
- **Downward loss (leaching)**
- **Upward loss (denitrification)**
- **Soil fixation/immobilisation**



Crop N uptake

How is N cycled within the tree at key developmental stages?

- Inter-annual phenological stages
- Multi-year (5 yrs) – juvenile to adult fruit bearing

What are the effects of varying N levels on fruit production and quality?

- How much N is too much?
- Trials on commercial orchards in Darwin & Katherine regions

Chroma meter: skin colour during ripening

L*(Lightness) vs Days Post Harvest

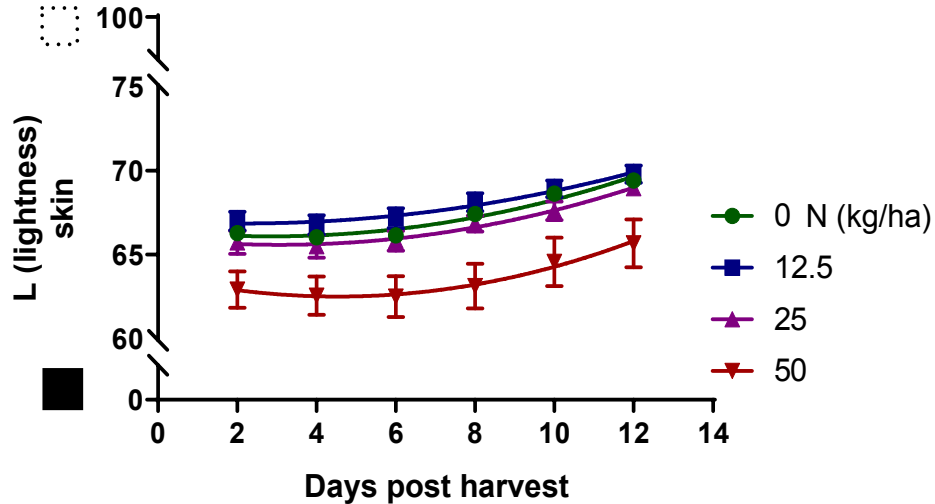


Figure 1. Chroma meter (Konica Minolta CR400) data for skin colour during ripening over twelve days post harvest showing the lightness of the skin colour from dark to light. Skin colour in the 50kg/ha was the darkest.

a*(Green- Red) vs Days Post Harvest

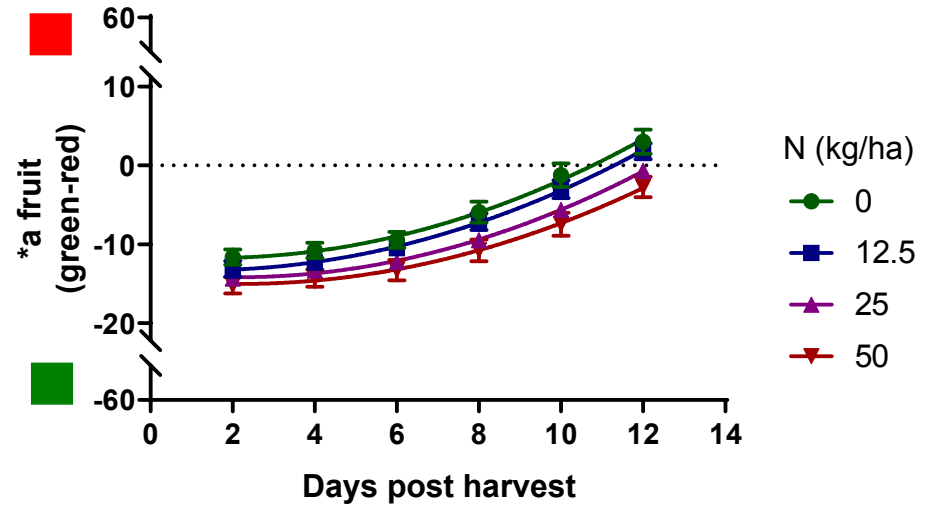


Figure 2. Chroma meter (Konica-Minolta CR400) data for skin colour during ripening over twelve days post harvest showing the transition of skin colour from green to red. Skin colour in the nitrogen treatments of 25 kg/ha and 50 kg/ha didn't transition from green to red.

b* (Blue – Yellow) vs Days Post Harvest

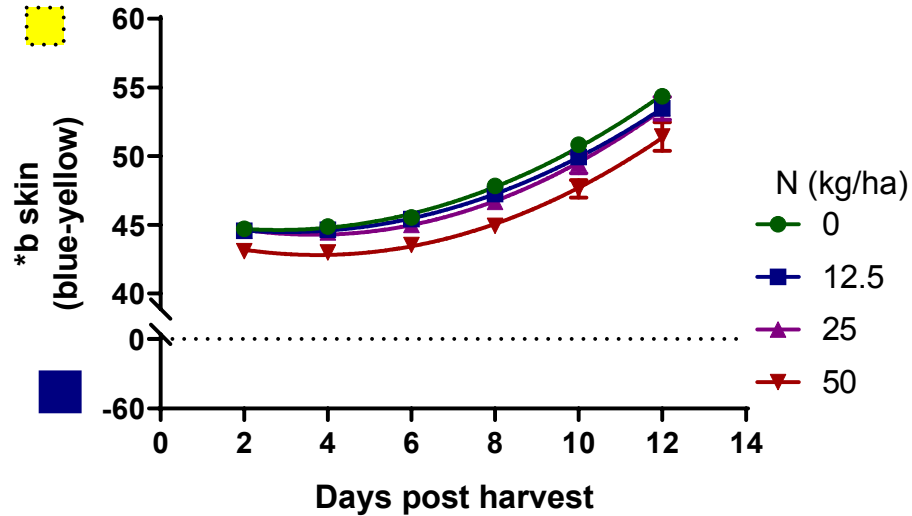


Figure 3. Chroma meter (Konica-Minolta CR400) data for skin colour during ripening over twelve days post harvest showing the transition of skin colour from blue to yellow. Skin colour in the nitrogen treatment of 50 kg/ha exhibited a mottled yellow/green skin.



Nitrogen 50 kg/ha, 8 days post harvest

Recycling

Biomass contribution to available N over a typical season?

- Commercial Calypso orchard (180 trees/ha) total plant material ~ 2tons/ha dry weight
- Abscised flowers- high N- > 3kg N/ha
- Complete season –abscised plant parts and PH pruning ~ 13.5kg N/ha

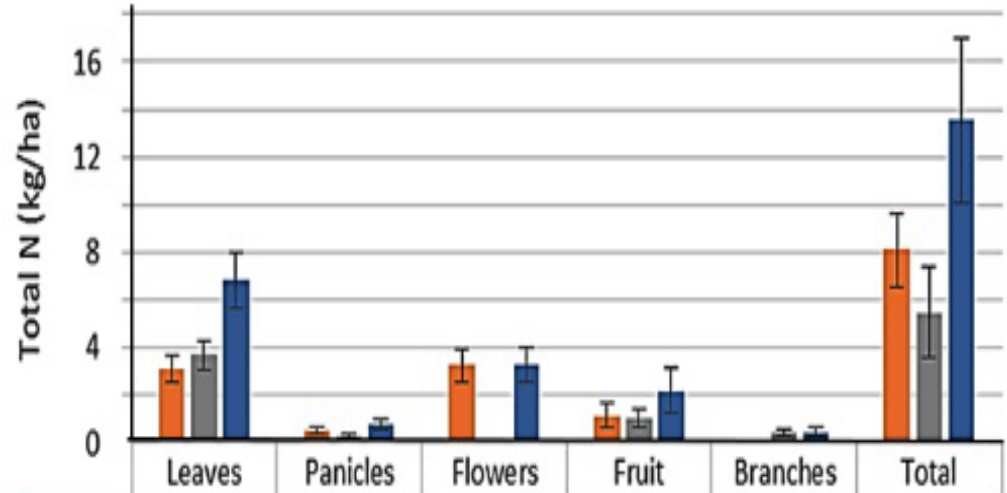
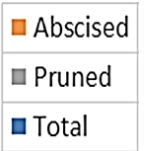


Figure 4. Plant material falling (abscised) from mature, Calypso mango trees along with pruned canopy material was collected, dried and weighed over a year to quantify the amount of nitrogen that cycled in the orchard in that material over time. Collectively, 13.5 kg/ha of nitrogen fell or was mulched onto the orchard floor.



Summary

- Data still being collected in regards to crop N uptake
- Adverse effects on skin quality is evident at ≥ 25 kg nitrogen per hectare
- Preliminary results indicate no significant difference in yield from a range of applied N from 0 -50 kg/ha.
- Orchard management practices can contribute a significant amount of N to the soil
 - Abscised plant parts and PH pruning ~ 13.5 kg/ha of N

More Profit from Nitrogen – use less nitrogen!

Thanks

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