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AGFORCE
NORTHERN AUSTRALIA
FOOD FUTURES
CONFERENCE 2023
22 - 25 MAY 2023

Silvopastoral Opportunities

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Timber Queensland

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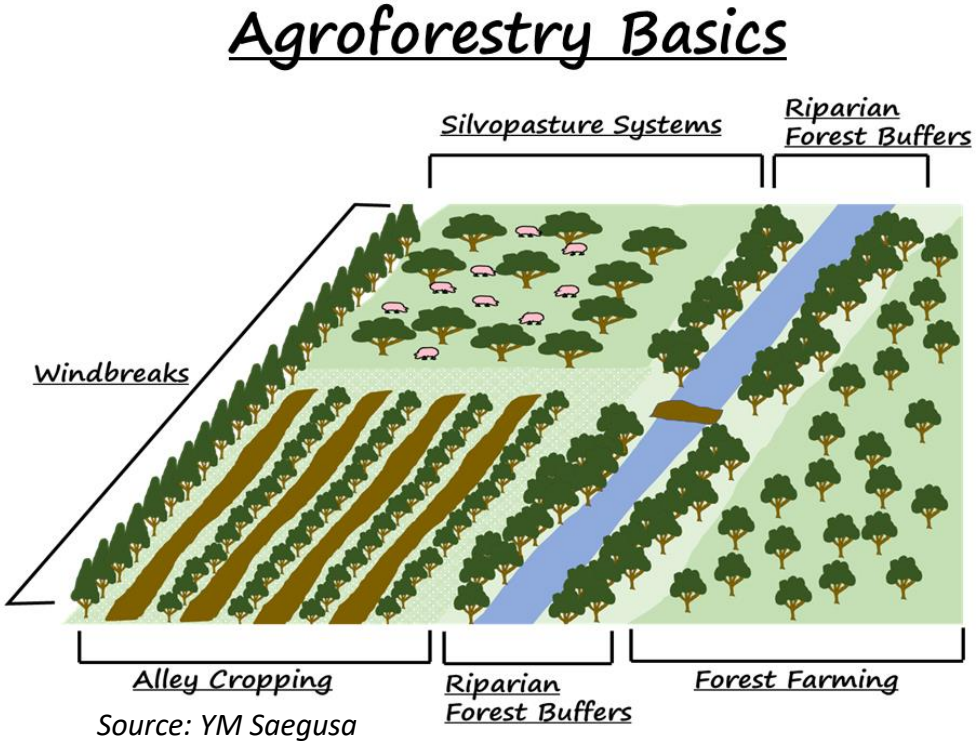
Silvopastoralism – a form of agroforestry

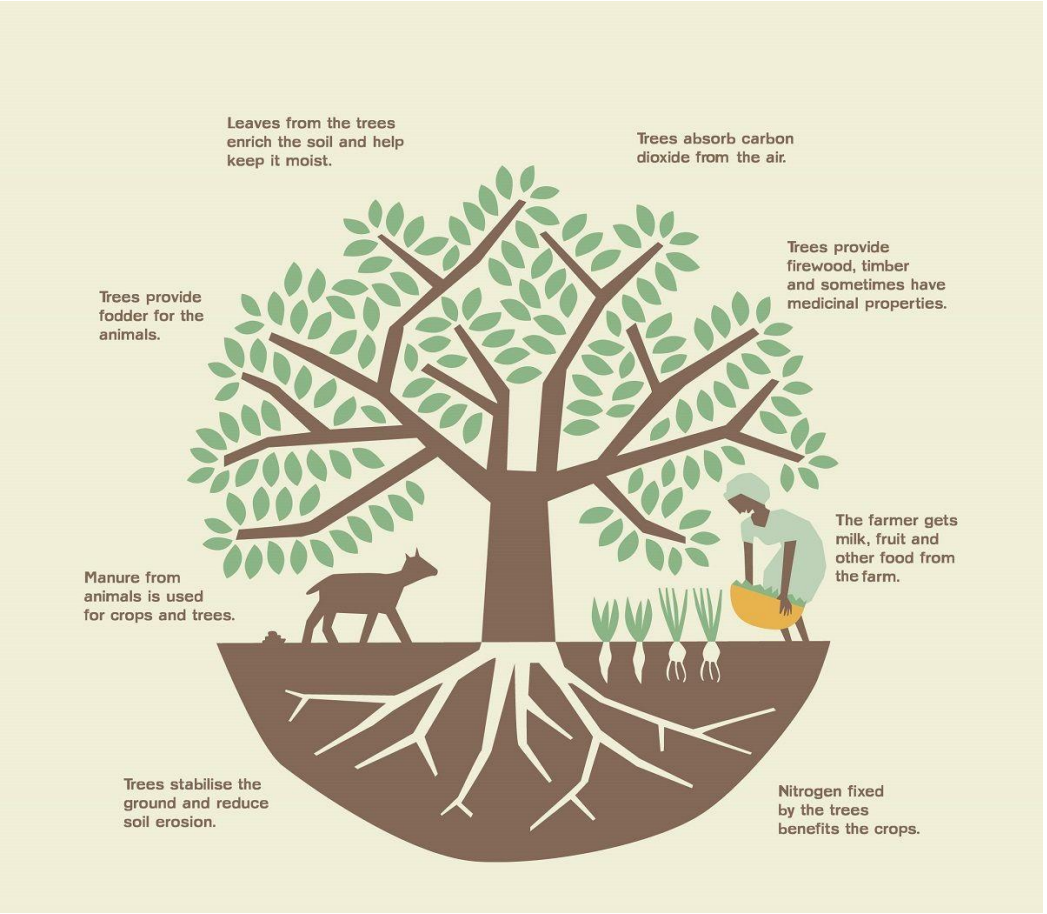
- practice of integrating trees, forage and grazing in a beneficial way
- variety of forms
  - wide spaced trees
  - tree rows with pasture alleys
  - riparian zones
  - patches
- livestock (cattle, goats, sheep)



Source: YM Saegusa

Overseas

- higher adoption rate than Australia
- widely used in developing countries (Africa, Asia)
- Europe has a long history in certain regions (e.g. Portugal)
- South American trials - pine and eucalyptus with cattle



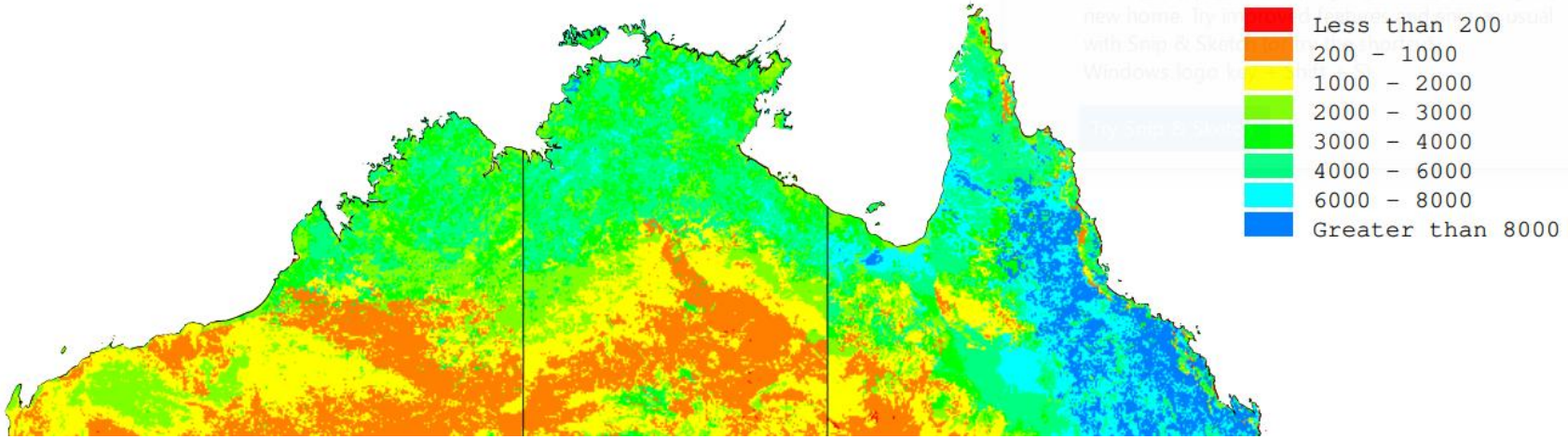
Churchill fellowship 2008

Why silvopastoral systems in the North

- extensive grazing already occurs (savannahs)
- farmers looking at ways to become carbon neutral
- mitigation and adaptation benefits
- income diversification with carbon and wood products
- agricultural productivity
  - shade and shelter for livestock
  - calving rates
  - soil and water conservation
  - pasture growth
- biodiversity

Grazing

Total Pasture Growth (kg DM/ha)
February 2021 to January 2023



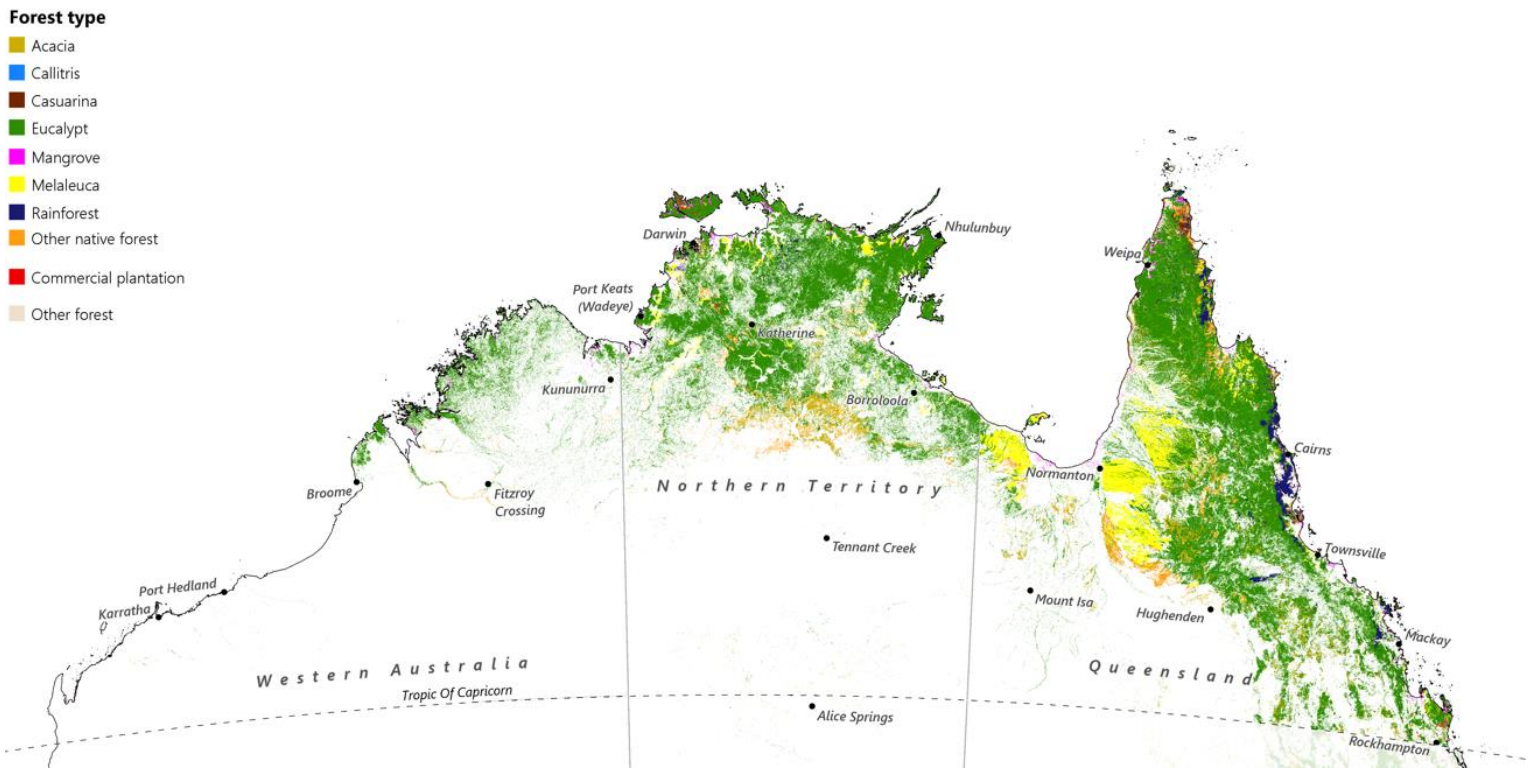
www.LongPaddock.qld.gov.au

Forests

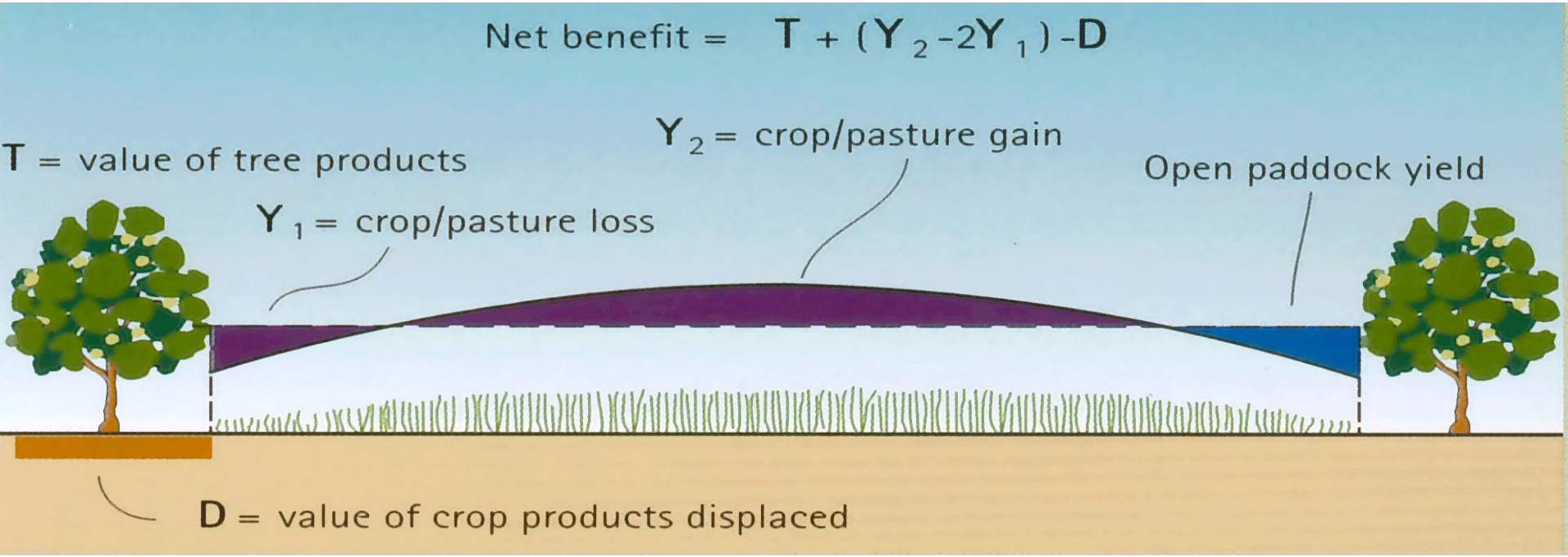
6 Mha commercially viable PNF

70% of forest indigenous owned or co-managed

CRCNA forestry and forest products industry situational analysis (Stephens et al 2020)

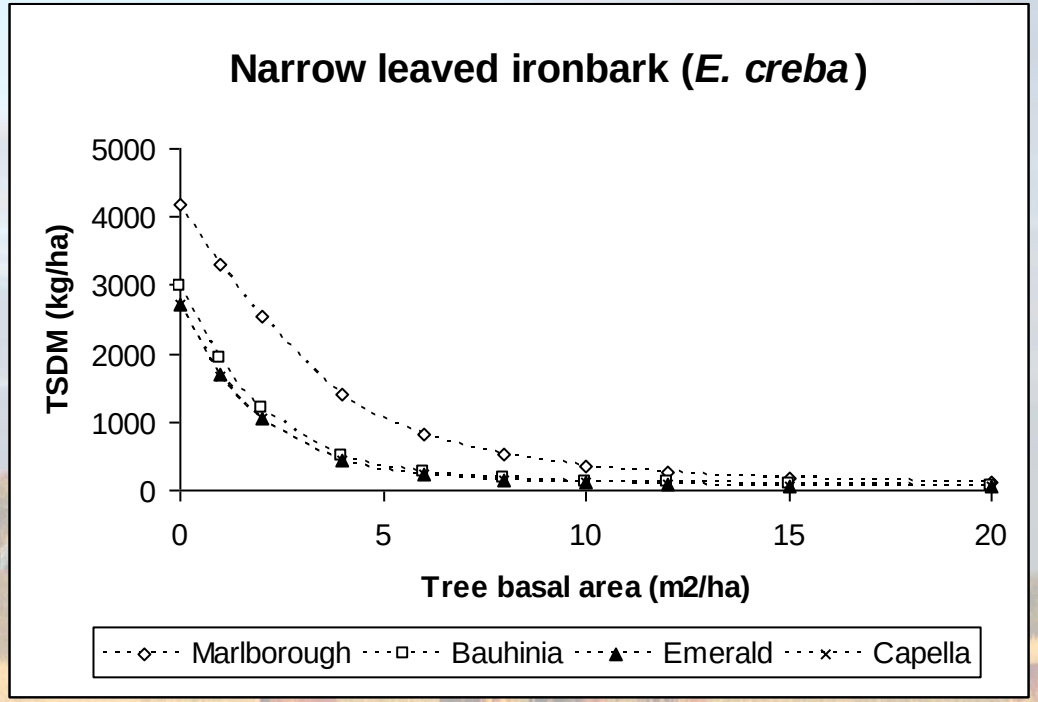


Trade-offs



Source: Abadi *et al* (2006)

Tree density and pasture growth



Source: McKeon et al (2008)

Silvopastoral systems can apply to:

- native woodlands and forests
- planted forests

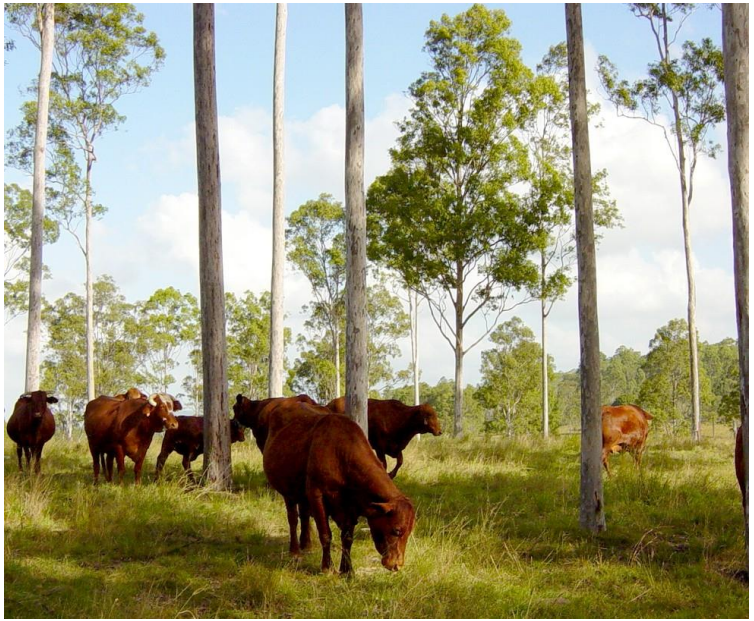
Tree growers – synergies

African Mahogany (*Khaya senegalensis*) - NT

Indian sandalwood (*Santalum album*) - WA

Tree growers – synergies

Hybrid pine (*Pinus elliottii × Pinus caribaea*) - QLD

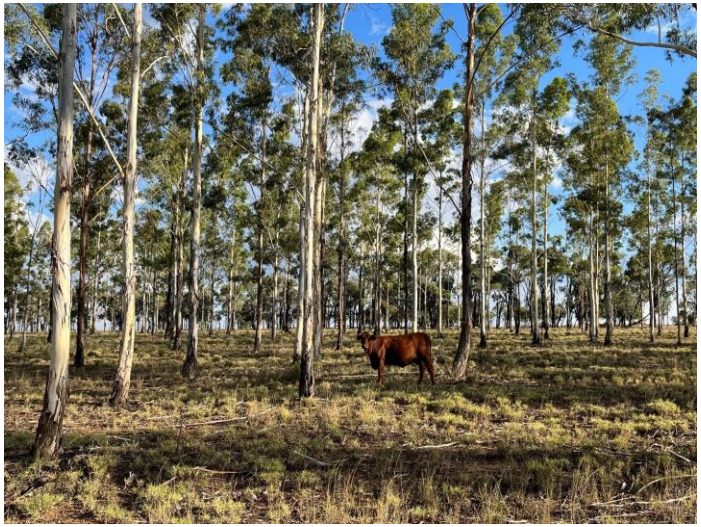


Spotted gum (*Corymbia maculata*) - QLD

R&D, trials and field experiments

- general principles to region specific
- biophysical and market information needed
- carbon data
- LWG data
- tree growth data
- **net financial returns**

Research



Chinchilla white gum (*Eucalyptus argophloia)*

Brigalow (*Acacia harpophylla*) belts in Central Queensland

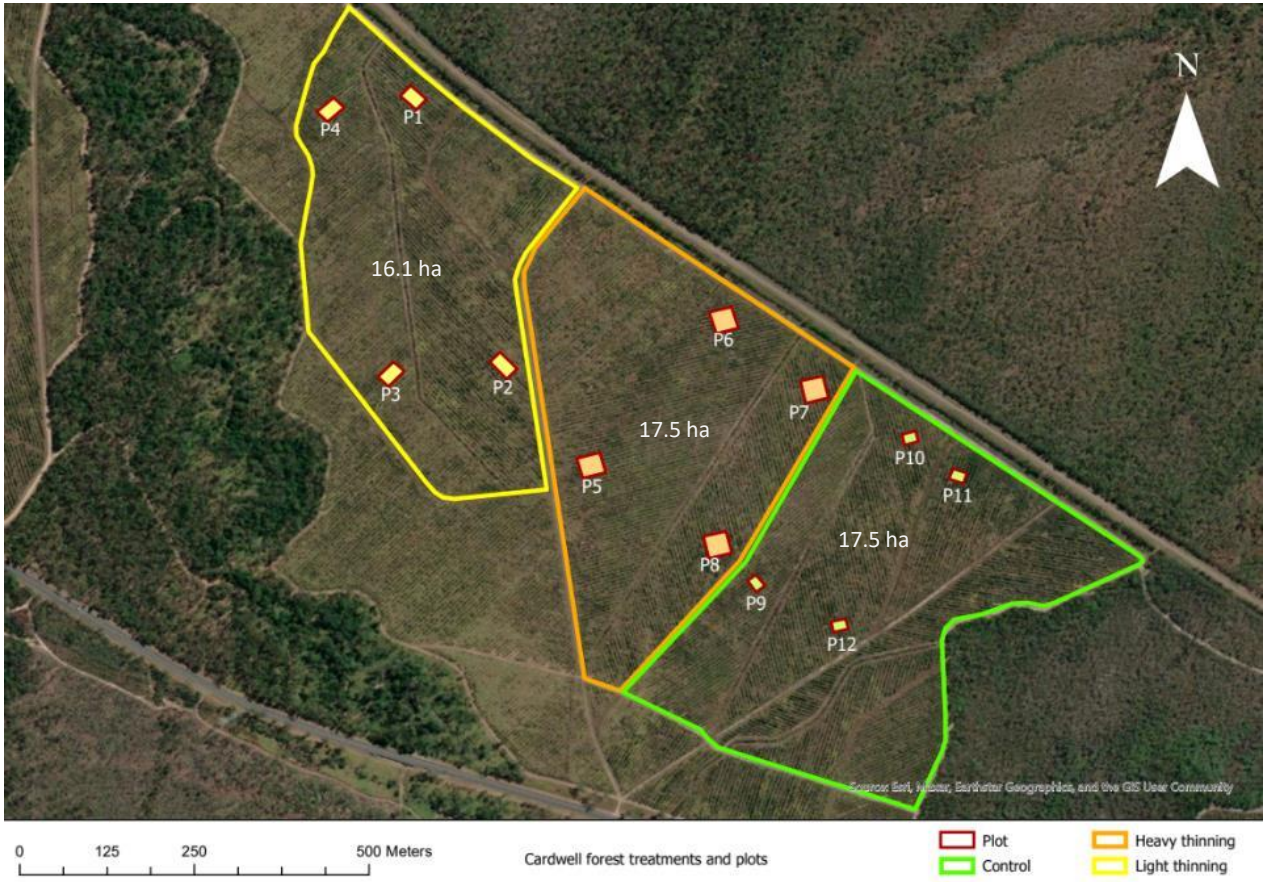
UQ Centre for Natural Gas - potential for carbon sequestration, timber and cattle in planted forests in Surat Basin

- silvopasture viable at modest carbon prices
- 600 – 750 mm rainfall
- Donaghy et al 2012

Silvopastoral trials of commercial pine systems in North Queensland

Treatments

Control - no alleys 808 stems
Light - 10m alleys 422 stems (52%)
Heavy - 20m alleys 364 stems (45%)



TerraCipher

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Pasture alleys

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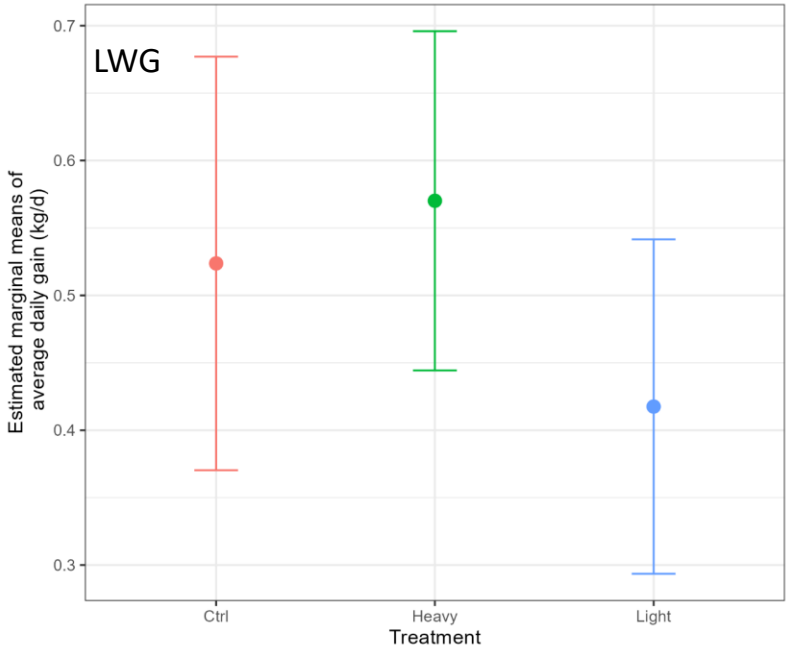
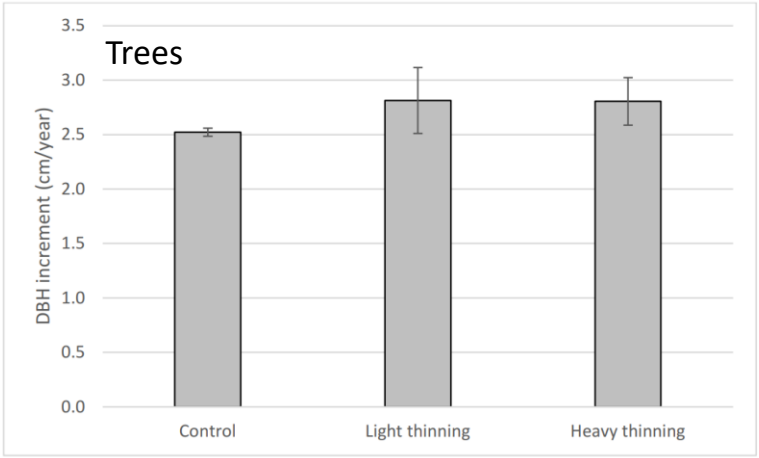
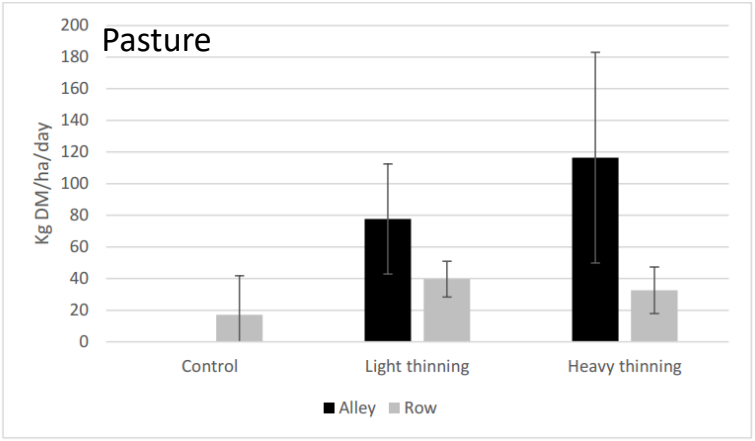
Early measurements







Native regrowth - QLD

Typical unmanaged native stand

Treated site (150 stems/ha) 6 years later

PFSQ PRIVATE FORESTRY SERVICE QUEENSLAND

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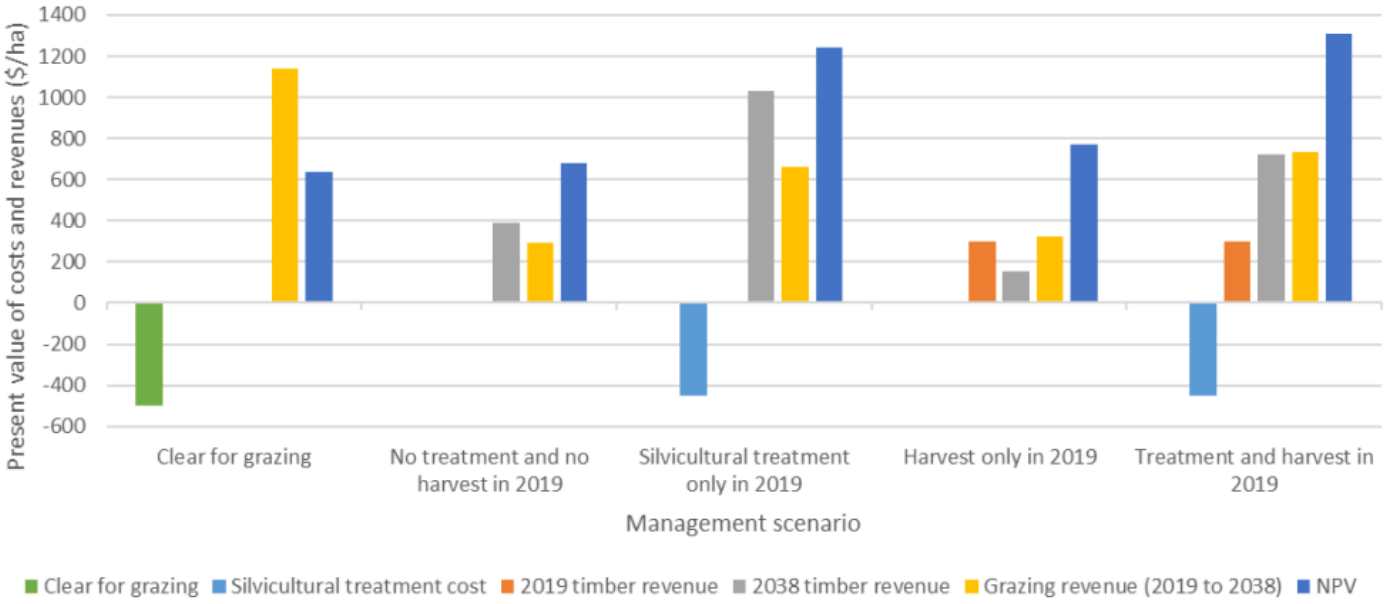
PNF study - QLD & NNSW

Improving productivity of the private native forest resource in southern Queensland and northern NSW (Lewis *et al* 2020)

2 Mha commercially viable PNF in SEQ

Gayndah case study – grazing with supplementary timber income



Thinning and silviculture generated highest NPV across all 4 case studies than grazing only (20 years, 5% discount rate)

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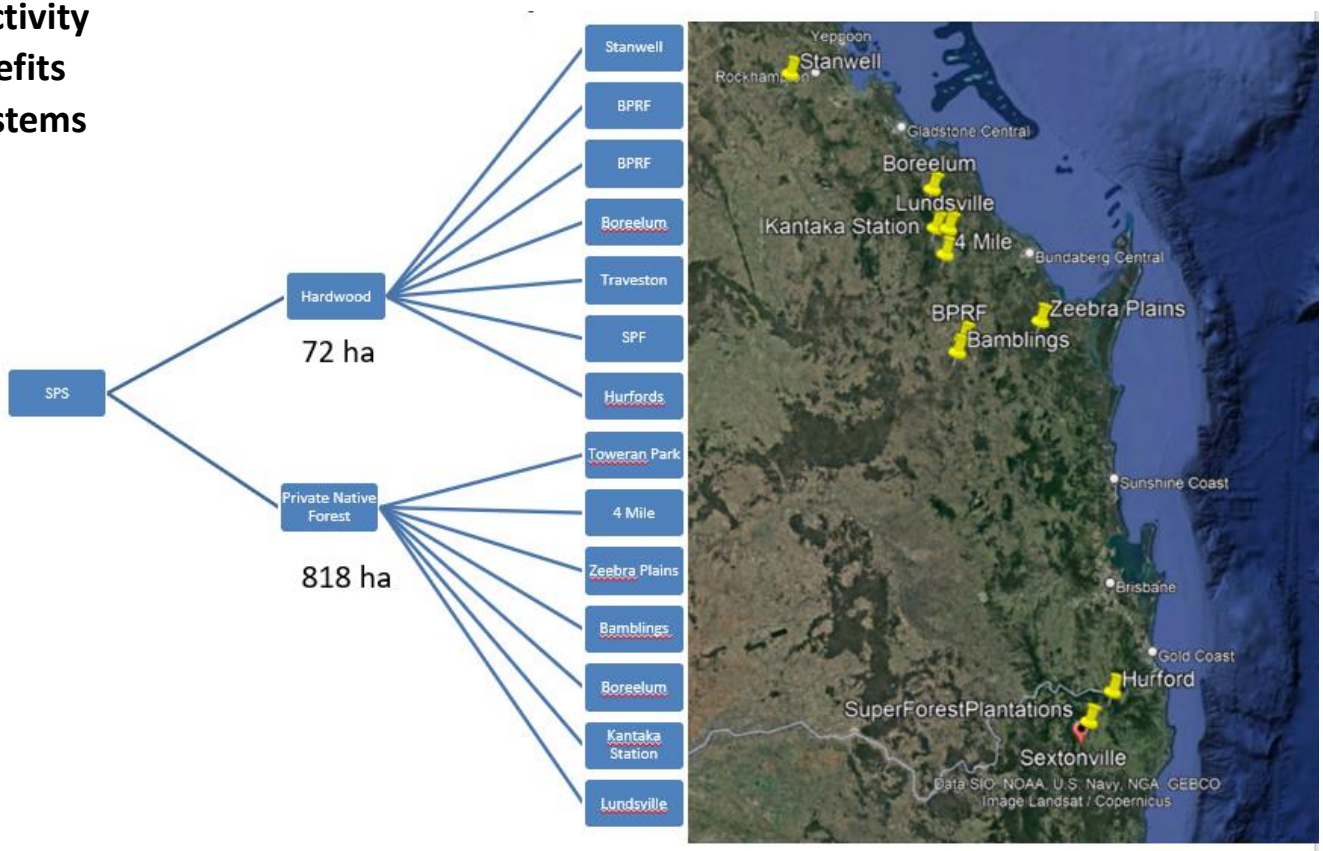
Steak ‘n wood project: demonstrating livestock productivity and environmental service benefits of trees on farm in northern systems

14 sites carrying out experiments with PNF and planted trees (5 years)



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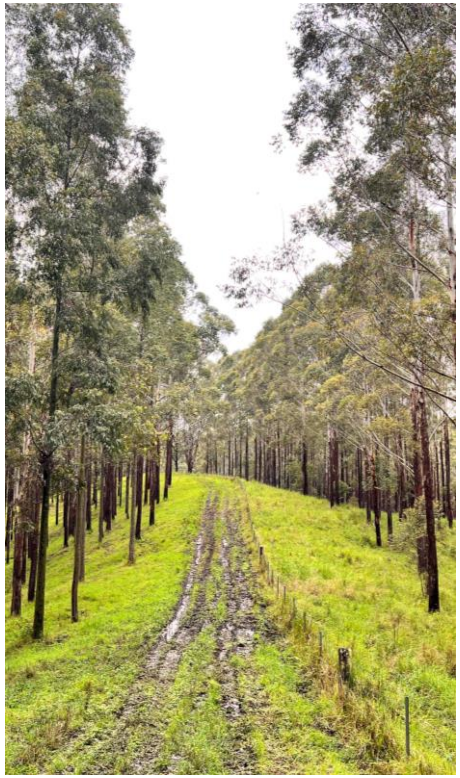
PNF (Four Mile property)

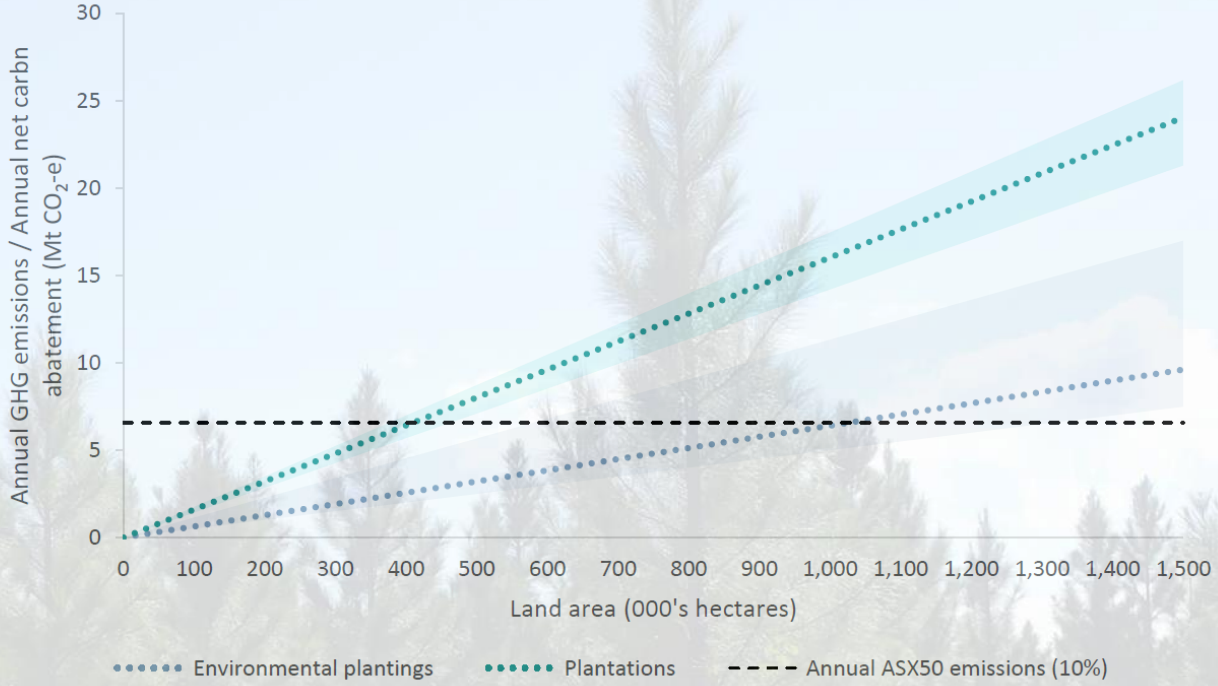
- long history of timber and livestock integration, effectively has silvopastoral system in place

Planted forest (Hurfords)



Carbon

- potential game changer
- ESG and ERF markets
- production trees higher carbon benefits than environmental plantings
- above & below ground carbon + HWPs



FWPA Report – *Estimating the implications of net zero targets.* Figure 5. Estimated land requirements to offset 10% of ASX50 emissions for the next 25 years

Summary

- silvopastoralism offers significant potential in Northern Australia
- can provide a range of benefits
  - farm productivity, carbon sequestration, climate resilience, wood production, income diversification, regenerative agriculture
  - still an emerging land use - need more R&D, demonstration sites and extension
- better quantification of benefits to inform farmers
- not a panacea for all land types but applicable to many areas
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