Northern Grazing Carbon Farming – Integrating production and greenhouse gas outcomes

Steven Bray, Dionne Walsh, Rebecca Gowen, Kiri Broad, Byrony Daniels and rest of project team

steven.bray@daff.qld.gov.au  www.futurebeef.com.au
Northern beef industry

- Aust. Beef industry 7th largest in world.
- Large number of head and area of land use.
- Water quality (e.g. sediment on Great Barrier Reef)
- Land condition
- Greenhouse gas emissions
  - Agriculture currently exempt from direct emissions reduction strategies (e.g. carbon tax)
- Impact of climate change
- Profitability pressures (McCosker et al. 2010)
  - Management change needs to be carefully considered to ensure appropriate productivity and environmental outcomes
Greenhouse gas emissions and beef

- Mitigation of GHG impacts beef production chain
- Options uncertain (particularly on-farm)
- Sequestration (soil and woody veg.) trade-offs

Source: redmeatgreenfacts.com.au
Climate Clever Beef

• Current project supported by Australian DAFF – Action on the Ground
• Building on previous MLA, Aust. DAFF supported projects
• 6 regions across northern Australia.
• Participatory model of development and extension.

• Evaluate ‘Carbon Farming’ project options.
• What impact will it have on the beef business?
• Focus on livestock methane, soil carbon and regrowth.

• Linking with regional groups, soil carbon and livestock methane research projects, pasture rundown project, modelling etc.

• Part of MLA’s Northern Grazing Systems Initiative
• DAFF Australian Farming Futures funding
Framework to systematically assess which management options are likely to have the best outcomes for a beef business.
Identification of options and analysis of options are evaluated in terms of:

- Productivity
- Profitability
- Land condition
- Greenhouse gas emissions
- Climate change risk
- Business resilience and adaptability

Climate Clever Beef website
www.futurebeef.com.au
Qld Gulf case study

• Purchased property with stock 15 years ago.

• Ran ‘as-is’ for 3 years, low weaning rates and poor land condition.

• Then undertook considerable effort to improve the business including:
  – Reducing stocking rates
  – Wet season spelling
  – Pasture improvement
  – Supplementation
  – Feeding of young cattle to meet weight-for-age targets
Analysed current situation and situation 15 years ago.

- Business financial analysis
- Herd structure and productivity

Profitability

- Gross margin has increased by 93% (BreedcowDynama)
- There is room for improvement compared to regional benchmarks (ProfitProbe) primarily due to high feed costs to reach weight-for-age specifications of younger cattle and reduced time to first calving.

Productivity

- Weaning rate improved from <50% to 70%, death rates reduced significantly
- Cow numbers reduced by about one third, however same number of calves
- Weight gains improved from 50-60 kg/hd/yr to 130-150 kg/hd/yr
- Beef sold increased by 80%
Land Condition
• 85% C-condition (poor) 15 years ago
• 85% A/B-condition (fair to good) currently

Greenhouse gas emissions
• 300 kg CO₂e/ha/yr 15 years ago
• 250 kg CO₂e/ha/yr currently
• 17% improvement

Greenhouse gas emissions efficiency
• 25.1 kg CO₂e/kg beef 15 years ago
• 11.7 kg CO₂e/kg beef currently
• 53% improvement
Climate change risk
• Good. Due to good land condition and feeding regimes (can be extended in poor seasons).

Business resilience and adaptability
• Fair. Due to some profitability indicators of concern.
• Conflict between cost of feeding strategy to improve productivity and reduce greenhouse gas emissions and impact on profitability

Future actions and analysis
• Heifer management to reduce feeding costs.
• Explore less costly feeding options and target only specific mobs.
• Explore alternative marketing strategies for different mobs of cattle.
• Property development which increases cattle numbers will increase GHG emissions (an issue for many properties in northern Australia).
Qld Fitzroy regrowth management

Business analysis indicated asset turnover was a key area for improvement.

Approximately 36% of property has regrowth reducing pasture production and beef productivity

Management options considered include:

- Regrowth retention (no re-clearing) allow regrowth to continue to regrow
- Clear regrowth using Graslan (Tebuthiuron) herbicide (slows subsequent regrowth)
- Clear regrowth using less intensive method (Chaining)
- Clear regrowth and plant a forage legume (Leucaena)

- Modelled change in woody plant basal area and impact on livestock carrying capacity.
Qld Fitzroy regrowth management

Net present value of regrowth management options over 30 years
• Assumed 1000 ha of 10 year old regrowth

<table>
<thead>
<tr>
<th>Regrowth Management Option</th>
<th>Livestock income only</th>
<th>Livestock and regrowth sequestration income ($10/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regrowth retention</td>
<td>$275,000</td>
<td>$652,000</td>
</tr>
<tr>
<td>Clear regrowth (herbicide)</td>
<td>$338,000</td>
<td></td>
</tr>
<tr>
<td>Clear regrowth (chaining)</td>
<td>$392,000</td>
<td></td>
</tr>
<tr>
<td>Clear and plant leucaena</td>
<td>$384,000</td>
<td></td>
</tr>
</tbody>
</table>

*(100 yr management obligations)*
Oaklands regrowth trial

• South of Duaringa
• Question: How much regrowth should be retained?
• Box land type
  – 10 year regrowth chained
  – 10 year regrowth retained
  – Herbicide cleared
  – Remnant
• Pasture spelling
• Measuring
  – Tree and pasture carbon
  – Soil carbon
  – Assess impact on business
Conclusion

• Climate Clever Beef framework was a powerful tool to:
  – Collaborate with and engage land managers to identify key business issues.
  – Assess options to improve business resilience.

• Will reduction in greenhouse gas emissions be achieved.
  – Depend on property development stage.
  – Regrowth retention may provide options.
  – Improving herd efficiency and GHG intensity should be a goal for all beef businesses. Win-win situation.

• Other Case studies available on Climate Clever Beef website.
  – www.futurebeef.com.au