Is Heffernan right? What is the real potential for pastoral and agricultural development in North Australia?

Neil MacDonald & Robyn Cowley
DPIFM Katherine (and drawing on collaboration with Steve Petty)
“Australian farmers have been told to move to northern Australia, where most of the country's rain falls, in an effort to find a solution to the nation's drought concerns.”

“Liberal Senator Bill Heffernan has called for financial incentives to encourage farmers to move north, rather than find new sources of water in the south of the country.”

“Australia's northern rivers have two thirds of the country's run off, or water that eventually flows out to sea, compared to just 4 per cent in Australia’s southern waterways.”

"There's no question - climate change is a reality. We've got to take our farm to where the water is,"
TSCRC Project 2.1.1
Grazing Tools

Developing grazing tools to improve savanna condition

- Customising methods for estimating safe carrying capacity
- Development of Risk Management Tool
- Testing MODIS satellite as a practical monitoring tool
- Demonstration/extension

QDPI, DAWA, DNRETA, Heytesbury Beef, DPIFM
Funding from TSCRC and MLA
Carrying Capacity

• Aim to match forage intake to a sustainable level of utilisation of pasture growth

• CC = safe level of utilisation x average pasture growth
Pasture growth
Background

- Paddocks large
- Average stocking rates low (11/sq.km)
- Land condition relatively good
- Uneven grazing

- Rising land values
- Increasing costs
- Trend of intensification
The Pigeon Hole Project
Grazing Strategies for tomorrow

1. Optimum levels of pasture utilisation
2. Strategies to achieve uniform grazing distribution
3. Alternative grazing systems
4. Conservation of biodiversity
5. Commercial evaluation

Heytesbury Beef, MLA, DPIFM, CSIRO, DNRETA, UQ
Utilisation

- 12-45% at Mt Sanford
- 15-40% at Pigeon Hole
- Effects on land condition and cattle production
Grazing distribution

Optimum paddock design
- Paddock size
- Grazing radius
- No. water points
Grazing systems

- Set stocking
- Constant utilisation
- Wet season spelling
- Cell grazing

Cell Grazing pdeks
Available pasture =

watered land type area \times \text{land type pasture growth} \times \text{land type utilisation}
VRD Utilisation study

Current utilisation rates in the VRD
Previous Studies on Utilisation

• **Petty (2001)** 10% utilisation on Heytesbury properties
• **Dyer et al (2003)** average SRs 11AE / sq km (15% on black soils and 25% on red soils in with average pasture growth, 13% & 21% for pasture growth that year)
• **Cobiac (2006)** 1997 survey – 16.4% (simulated median pasture growth 1957-2004 at 10 properties by land type)
• **Cobiac (2006)** 2004 survey – 16.3% (simulated average regional pasture growth at a single point and applied to 24 properties
Other factors influencing actual utilisation rates

• Accessibility – mesas, rocky outcrops, saline mudflats, lakes
• Distance to water
• Station by land type pasture estimates
VRD Utilisation Study

- 12 properties spanning the geographical range of the VRD. Stock numbers from pastoral lease records 1993-2007
- Land system x property pasture growth analysis
- Compare to recommended utilisation rates for each land type based on:
  - Black soil – 20%
  - Good red soil – 15%
  - Poor red soil – 10%
  - Spinifex – 5%  ............. Average 11%
VRD regional analysis

• We found that average utilisation rates are 10 % based on total station area, but 12 % of accessible area.
• Without development there is little evidence that there is capacity for additional stock numbers, although this varied between stations
• More waters will lower actual utilisation rates
• There may be a discrepancy between estimated safe utilisation rates and those derived from ell managed paddocks over the years – this we want to test
• Rotational grazing has the potential to allow higher utilisation rates
Utilisation – further work

- Testing long term utilisation rates in commercial industry to refine estimates for different land types
- Refine effect of land condition
- Effect of mixed land types within a paddock when cattle don’t graze evenly
Increasing price of grazing land

- **27%** annual real growth in NT grazing property values 1999-2007 (Aust 12%), so a property bought for $1m in 1999 would fetch $8.5m today.

- The value of NT grazing land is now about $1000-$1200 per beast area. At 7.5% interest that works out to be 27% pa of value of cattle sold (or 20% at 5.5% opportunity cost). Interest on the cattle would be 11% (8%).

Sources: Rural Management Partners & Herron Todd White Dec 2007
Price-Productivity Ratios for Beef Cattle Properties

- Northern Territory
- Upper Cape York
- Western Gulf
- Western NSW
- Eastern Gulf/Lower Cape
- Central West NSW
- Central South Qld
- Desert Uplands NQ
- Mitchell grass CQ
- Tablelands NSW
- Coasts and Ranges NQ
- Basalt & Goldfields NQ
- NW Downs NQ
- Brigalow Belt CQ

Data from Herron Todd White 2007
Change in pasture growth over time

Rainfall

Pasture growth

Financial year
Change in pasture growth since 1970s vs long term average

<table>
<thead>
<tr>
<th>long term average pasture growth (kg/ha/yr)</th>
<th>increase in average pasture growth since 1970s (kg/ha/yr)</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1856</td>
<td>-51</td>
<td>-3%</td>
</tr>
<tr>
<td>1261</td>
<td>275</td>
<td>22%</td>
</tr>
<tr>
<td>761</td>
<td>433</td>
<td>57%</td>
</tr>
</tbody>
</table>
Climate Change predictions for NT
October 2007

- Higher average temp (+ 2 degrees by 2030)
- Increase in number of days over 40 degrees
- Rainfall predictions still inconclusive in north
- High rainfall over the last 20 years may be the result of Asian pollution
- Evaporation increase
- Moisture balance decline (-30 to -130mm)
- Increase in severity of extreme climate events
- Increased CO₂ favours certain plants types
Climate change – northern NT

- Best bet for rainfall in north NT is that it will stay the same.
- Temps and evaporation increase, but these negative effects may be offset by CO₂ fertilisation
- Even though this is different from the public perception that rainfall will continue to increase, still a better bet than much of southern and eastern Australia where rainfall predicted to decline
- This will continue to drive development in northern Australia