Precision Pastoralism for Australian beef producers

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Key points

• Managers of large pastoral properties increasingly need tools to modernise their operation
  – Reducing costs
  – Increasing productivity and
  – Managing the environment safely
• Developing customised technology systems to deliver new management paradigm
• The concepts may be interesting to you!
Australia’s deserts

- Australia is the driest inhabited continent in the world;
- 70% of it is either arid or semi arid land
- Highly variable rainfall in timing and intensity
Monthly NDVI 1982-1997
Rangelands of Australia
Spinifex grasslands
Chenopod shrublands
Acacia shrublands and woodlands
Tussock grasslands
Australian pastoralists
manage...

- Enormous areas
  - Properties of 100s to 1000s of square km
  - To drive around water points can be 500 km
- Water points – driver of behaviour
  - Focal point for management
- Limited labour
- Not seeing stock regularly
- Not seeing condition of pastures regularly

*If you can’t measure it you can’t manage it*
‘Precision Pastoralism’

- Individual animal data
  - Accurate
- Spatial data
  - Remote sensing with high spatial resolution (MODIS)

more frequently
Remote livestock management systems

**Savings**
- Costs of fuel & labour
  - checking water points
  - Mustering

**Profits**
- Improved animal weight gain
- Optimised weight for sale
- Better breeding results
Remote livestock management systems

<table>
<thead>
<tr>
<th>Feature</th>
<th>Function</th>
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<tbody>
<tr>
<td>RFID tags</td>
<td>individual identification</td>
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<tr>
<td>Walk over weighing</td>
<td>Stock condition, growth trajectory</td>
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<tr>
<td>Automatic drafting</td>
<td>separate animals for sale, medication, tagging, etc</td>
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<tr>
<td>Telemetry</td>
<td>monitor and control remote infrastructure</td>
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<tr>
<td>Software</td>
<td>for animal and herd management from station house PC</td>
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</tbody>
</table>
Remote livestock management systems elements
Automated Weighing

- Weigh livestock on way to water or supplements
- Four foot steps required
  - Tru-Test indicator
  - No need to stop the animal
Automated Weighing
Drafting

- draft selected animals for a range of management practices
  - Supplements, medication
  - Tagging
  - Sale
  - Disposal
  - Breeding
Drafter

- Solar and Air Powered
Producers consistently ask for a picture (photo and video)

- Communication is a UHF data link
  - OBSERVANT
- Monitor
  - Trough and tank water levels
  - rain gauge
  - Pipe flow rates
  - Pumps on/off
  - Medicators
Telemetry

- Reduce driving time and cost by around half
- Repay costs in 6-12 months ($20,000-$60,000 per year)
- Save many tonnes CO₂ emission

- WiFi and WiMax networks
  - Mbps data transfer
  - Real-time video
  - More data sent and received for control of infrastructure
Management intelligence

• Vast amount of new data being generated
• Intelligent software
  – Forecasting
  – Interventions
  – Alerts
Tracking weight gains and loses

- Average Weight Gain/Loss for 300 Breeding Cows over 1 month
### Tracking weight gains and loses

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| Weight Averages   | 313.5      | 299.6      | 310.5      | 307.8      | 313.5      | 307.9      | -6              |
Auto Weaning

- Automatically wean calves at an exact weight or time
- No mustering stress
Cost/benefit analyses of RLMS in Australian beef herds*

- Better sales prices - $100M
  - Optimal sale weight 500kg
  - Animal sold at 425kg (15% below optimal weight) loose potential revenue of $120 (at $1.60/kg)
  - Profit from an extra 10% of beasts sold at optimum weight

- Lower mustering costs - $1B

- Estimate 4% growth in beef export value from systems

*Assumes adoption rates of 10-15-20% over 3 years
Summary

• Precision pastoralism options to
  – Reduce costs
  – Increase productivity
• Turning cost of ID tags into a profit driver
• Potential dollar value benefits are enormous
Acknowledgments

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