Management of grazing systems to 2030

Melissa Rebbeck - SARDI – Climate Applications

Acknowledge – Russell Pattinson, Phil Graham, Andrew Moore, Peter Hayman
What we did

Grass Gro

- Look at management, production, genetic and financial changes on livestock enterprises (50)
- Current base line enterprises vs base line under climate stress

Approaches for adaptation

- Projections for 2030
- Trends – eg 1995 to 2005

Other approaches by this project

- Sensitivity – Warmer and drier or wetter
- Spatial – Warmer and drier or wetter location.
pasture

climate

GrassGro for future climates

soil

livestock
Role of livestock producers

- Confirm base case scenarios
- Suggest adaptations strategies
- Confirmed which adaptations they are most likely to implement
Today

- Impacts of climate stress on livestock systems
- Adaptations tested (to date)
- What we have learned
- What producers have learned
- Conclusions
Impact of climate projections on key indicators

*Such as:*

- Supplementary feeding
- Minimum Ground Cover
- Pasture growth
- Gross Margins
- Ewe or Steer Sale weight
- Wool Cut/ha
- Sale times
Long term average rainfall - Lucindale
Historical vs Future (2030 A2)
Gross Margins Merino x terminal sire Lucindale
1995-2005 stocking rate x lambing time

<table>
<thead>
<tr>
<th>Month Lamb</th>
<th>Mar</th>
<th>Jun</th>
<th>Jul</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocking Rate</td>
<td>5.5/ha</td>
<td>7/ha</td>
<td>8.5/ha</td>
</tr>
</tbody>
</table>
Supplementary Feed Merino x terminal sire
1995-2005 stocking rate x lambing time - Lucindale

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<tr>
<th>Month</th>
<th>Lambing Rate</th>
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<td>Jul</td>
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</table>
March Lambing

5.5/ha

Sub Clover

Phalaris

June Lambing

7/ha

July Lambing

8.5/ha

Sub Clover

Phalaris
<table>
<thead>
<tr>
<th></th>
<th>Merino</th>
<th>Prime lamb</th>
<th>Prime lamb annual pasture</th>
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<tbody>
<tr>
<td>ewes</td>
<td>50 kg 17μ</td>
<td>55 kg 21μ</td>
<td>55 kg 21μ</td>
</tr>
<tr>
<td>sire</td>
<td>merino</td>
<td>Poll Dorset</td>
<td>Poll Dorset</td>
</tr>
<tr>
<td>Conception</td>
<td>100%</td>
<td>105%</td>
<td>105%</td>
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<tr>
<td>lamb</td>
<td>28 July</td>
<td>12 June</td>
<td>12 June</td>
</tr>
<tr>
<td>wean</td>
<td>1 November</td>
<td>1 October</td>
<td>1 October</td>
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<tr>
<td>Wether lamb sale LW</td>
<td>35.1 kg</td>
<td>48.8 kg</td>
<td>49.0 kg</td>
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<tr>
<td>GM</td>
<td>$275/ha</td>
<td>$278/ha</td>
<td>$304/ha</td>
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<tr>
<td>Supplement (barley)</td>
<td>$23/ha</td>
<td>$38/ha</td>
<td>$38/ha</td>
</tr>
<tr>
<td>Stocking rate</td>
<td>8 ewes/ha</td>
<td>7 ewes/ha</td>
<td>7 ewes/ha</td>
</tr>
<tr>
<td>DSE/ha</td>
<td>12.1</td>
<td>11.9</td>
<td>11.9</td>
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<tr>
<td>Pasture use</td>
<td>48%</td>
<td>43%</td>
<td>39%</td>
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<tr>
<td>Pasture yield</td>
<td>7307 kg/ha</td>
<td>7718 kg/ha</td>
<td>8662 kg/ha</td>
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<tr>
<td>Pasture growth</td>
<td>7527 kg/ha</td>
<td>7984 kg/ha</td>
<td>8761 kg/ha</td>
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<tr>
<td>Kg/ha wool CFW</td>
<td>35</td>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>Kg/ha meat LW</td>
<td>196</td>
<td>317</td>
<td>318</td>
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<tr>
<td>Runoff (mm)</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Deep drainage (mm)</td>
<td>73</td>
<td>73</td>
<td>83</td>
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</table>
Other approaches

Comparing enterprises
Sensitivity
Spatial
Comparing enterprises - dry and wet years - 2030

- Big differences between wet & dry years
- Sheep more resilient in dry years while cattle perform well in wet years

Grenfell Enterprise Change - Dry / Wet Years

- Stocking rate Δ
- Profit Δ

% Change

Mo Term  Cattle S Rep
Sensitivity approach

Surface charts – Brendan Cullen

Elliott, NW Tasmania

1971-2000

Warm and Drier

See Brendan Cullen talk Thursday
### Spatial approach - dry and wet years - 2030

- Predicted climates change even between regions
- Can have big differences on profits

<table>
<thead>
<tr>
<th>Location</th>
<th>Rainfall</th>
<th>Temperature</th>
<th>Stocking rate</th>
<th>Profit $/ha</th>
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</thead>
<tbody>
<tr>
<td><strong>Yass</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dry (G)</td>
<td>-17%</td>
<td>+10%</td>
<td>3.6</td>
<td>63</td>
</tr>
<tr>
<td>Wet (UK)</td>
<td>-2%</td>
<td>+6%</td>
<td>5.8</td>
<td>240</td>
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<tr>
<td><strong>Grenfell</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry (G)</td>
<td>-13%</td>
<td>+8%</td>
<td>2.5</td>
<td>-17</td>
</tr>
<tr>
<td>Wet (UK)</td>
<td>0%</td>
<td>+6%</td>
<td>5.5</td>
<td>114</td>
</tr>
</tbody>
</table>
Impacts

• No one future
• Generally shorter growing seasons
• Reduced farm Gross Margins and more variability
• Greater Variability in growth
• Feed available for less time
• Perennials not growing as well in higher rainfall areas (South east SA)
What we learned

• Climate change negatively impacts most enterprises
• Value of adaptations vary across regions
• Difficult to get over 50% pasture utilisation without grazing management
What livestock producers learned

Minimise need for supplementary feed by;
• Reviewing lambing and calving times (as per tests in Grass Gro)
• Review age at first joining
• Reviewing stocking rates
• Reviewing sale times
• Core Breeding and more trading
• Flexibility to adjust numbers as season progresses
• Match to livestock condition
What livestock producers learned

Increase flexibility in their systems by;
• Varying sale times/rules, confinement feeding, movement, more animal trading (core breeding), self replacing system, agistment

Better pasture utilisation by grazing management systems
• Controlled, cell, rotational, confinement, movement
• Larger mobs for shorter periods of time
• Match livestock feed demand to pasture production
• Maintain high pasture quality by adequate fertiliser
• Maintaining pasture in growth stage 2
Conclusions discussed

Total dry matter less with perennials but better feed utilisation
  • Need good grazing management
  • Lucerne not as good with less summer rain
  • Good on non wetting sands or deeper sand (Lucerne)
  • Provide protein
  • Provide ground cover

• Annuals
  • Performed better than perennials alone in higher rainfall areas
  • Better digestibility
  • Cut excess for feed supplement
  • May incorporate more annuals and less perennials
Further recommendations

• Know your cost of production
• Good labour efficiency
• Genetic improvements will lessen the impacts
• Maximise production /ha not necessarily numbers per ha
• Increasing livestock trading does not remove the threat in many areas
• Wool provides a shock absorber in poor seasons
• Diversify across locations

More work on pasture species mixes
More analyses and workshops in all southern Australian states