Flexibility in sheep systems – lessons learnt from EverGraze research at Wagga/Tarcutta

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EverGraze

• Perennial pastures are good for maintaining groundcover and reducing dryland salinity
• But how do we get the best returns from them to justify the investment?
• Questions:
  – How much lucerne on the farm?
  – Green feed at joining and lambing %
  – Can perennials improve lamb survival?
  – What sheep system gives the best return from perennials?
• Addressed through grazing trials and computer modelling
Stocking rate and lambing time

- Production/ha driven by stocking rate
- Choice of lambing time affects optimal ewe stocking rate
- The trick is to match feed demand with feed supply to maximise production and control costs
  - Different lambing times will lend themselves to selling stores rather than finished lambs
Stocking rate and GM – September lambing merino x terminal at Tarcutta

20% of farm as lucerne
80% phalaris
40 years weather data
Modelling a Merino terminal system

- 55 kg merino ewes joined to terminals, replacements bought
- 1971-2011 Tarcutta weather data
- Farm of 80% phalaris/sub and 20% lucerne/sub between Wagga and Tarcutta
- Sell lambs – flexible policy
  - by 12 months of age or when the heaviest group weighed 60 kg
  - or if no live lucerne was available
  - or if lamb growth rates fell below 20 g per day
  - no production feeding
Lambing time at low stocking rates

Lambs sold at 60kg or when growth rate less than 20g/d
Stocking rate, lambing time and Gross Margin

More ewes = more wool/ha, lighter lamb sale weights but similar lamb/ha to earlier lambing
Conclusions from modelling

• Based on the last 40 years of weather data, a grazing property with 20% lucerne between Wagga and Tarcutta running a merino system joined to terminals:
  – Would have been better off lambing in September and running more ewes/ha to produce mainly store lambs than lambing in July (less ewes/ha) and producing mainly finished lambs
  – Trying to run more ewes/ha for July lambing reduces margins because feed costs increase (as winter is normally the time of greatest feed shortage)
Grazing experiment

- 2006-2010 at Coreinbob
- CentrePlus Merino ewes
- Grazed a perennial pasture base (20% of farm as lucerne, remainder phalaris and tall fescue) and fed off plots when required to maintain groundcover
Wagga EverGraze site (12 x 5ha farmlets)

- Phalaris (clay loam, pH 6.5, red-brown)
- Tall Fescue (Clay loam, pH 6.5, brown-grey)
- Lucerne (clay loam, pH 6.5, red-brown)
What lambing time best uses the perennial pasture base?

• Three different sheep systems compared
  – Winter (July) lambing (Merino only)
  – Spring (September) lambing (Merino and terminal)
  – Split lambing (July and September lambing) (Merino and terminal)

• All lambs ‘sold’ and replacements bought in

• Ewes managed to achieve CS 3 at joining and lambing

• The systems had different ewe numbers but a similar mid winter stocking rate to maximise potential returns for that lambing time
Winter (July) lambing system approx.
stocking rate

Advantages
- less susceptible to failed spring
- Sell or keep lambs depending on season, buy instock, conserve fodder in good years

Disadvantages
- lower kg/ha in average and better years unless buy in stock
- lamb survival
September Lambing approx. stocking rates

Advantages
- better captures spring growth in average and better years - higher kg/ha
- Only carrying ewes over summer/autumn

Disadvantages
- susceptible to failed spring - high feed costs and poor lamb weights
Split joining/lambing approx. stocking rate

**Advantages**
- inherently flexible - destock tradeable stock in poor years or keep to capitalise in better

**Disadvantages**
- Managing 2 joining and lambing times

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[Graph showing DSE/ha over time with key events such as lambing and weaning marked]
Cumulative rainfall (mm) at the site
5 year average GM

Winter lambing merino: $81-$283
September lambing: $14-$282
Split lambing: $86-$394

Lamb $2.80/kg
Wool $8.88/kg
Supplement $200/T
## Production differences

<table>
<thead>
<tr>
<th></th>
<th>06-10 average</th>
<th>July Lambing</th>
<th>Split Joining</th>
<th>Sept lambing</th>
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<tbody>
<tr>
<td>Lamb kg/ha</td>
<td>172&lt;sup&gt;a&lt;/sup&gt;</td>
<td>196&lt;sup&gt;b&lt;/sup&gt;</td>
<td>175&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
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<td>Clean wool kg/ha</td>
<td>15.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18.9&lt;sup&gt;b&lt;/sup&gt;</td>
<td>27.4&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>355&lt;sup&gt;a&lt;/sup&gt;</td>
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Conclusions from the experiment

• Spring lambing struggled in this experiment due to 4 poor springs.

• Split Lambing was more flexible due to
  – lower stocking rates (reducing feed costs)
  – lambing at different times enabling one drop of lambs (July) to be sold at good weights regardless of season
  – the ability to react quickly (by selling lambs) to deteriorating seasonal conditions.
  – Keeping lambs

• If a proportion of the flock were tradeable stock (eg wethers), a spring lambing flock could also adjust to seasonal conditions more readily than a ewe-only flock

• Winter Lambing had the lowest production risk, but low stocking rates meant it had limited ability to increase production in favourable seasons.
BUT...these were ‘abnormal’ years

1971-2010 GrassGro simulated GM

Lambs sold at 23 weeks in all simulations
14 DSE/ha mid-winter stocking rate
How would split lambing perform over the long-term?

- GrassGro model can’t run 2 lambing times for same flock
- Have modelled using MIDAS for an ‘average year’
What does it all mean?

• Split lambing worked in the experiment because it was more flexible
  – But 2 lambing times won’t suit everyone, and more modelling is underway to look at long term performance

• September lambing produced poorer results in the experiment as it was less flexible in the poor years
  – Modelling shows it can produce greater gross margins over the long term than winter lambing
  – But having all DSE’s associated with a September lambing breeding flock is riskier, and requires good tactical management to cope

• Potential stocking rates will be determined by understanding your annual feed supply and demand
  – Soils, climate and pasture species on the farm all affect supply
  – Stocking rate, lambing and sale dates all affect demand
Production differences and yearly GM

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Lamb $2.80/kg
Wool $8.88/kg
Supplement $200/T
How much of the grazing system should be lucerne?

- Spring Lambing Merino flock joined 50/50 to merino/terminal sires
- Ewes fed to achieve CS3 for joining and lambing
- Lambs weaned at 12 weeks from the start of lambing (average of 10 weeks)
- Lambs sold at weaning unless green feed (lucerne) available
- Compared 20% vs 40% of the farm to lucerne
Wagga EverGraze site
More summer actives provides options
But these were ‘abnormal years’

1971-2010 GrassGro simulated GM

<table>
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<tr>
<th>$/ha</th>
<th>20% Lucerne</th>
<th>40% Lucerne</th>
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<tr>
<td>-750</td>
<td>-$165-$481</td>
<td>-$166-$505</td>
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Merino x terminal, 30% twins
Joined in April
ALL lambs sold at weaning
Same simulation with lambs retained until 23 weeks of age

Tactical management is important to capture the benefits!
Green feed over joining can increase ovulation rate
Pasture flushing

**Mean ovulation rate 2006-2008**

<table>
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<tr>
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<th>Mean number of ovulations per ewe</th>
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<tbody>
<tr>
<td>Phalaris</td>
<td>a</td>
</tr>
<tr>
<td>Lupin</td>
<td>ab</td>
</tr>
<tr>
<td>Lucerne</td>
<td>b</td>
</tr>
<tr>
<td>Chicory</td>
<td>b</td>
</tr>
</tbody>
</table>

Oestrus-synchronised ewes grazed plots for 9 days prior to ovulation
Relationship between multiple ovulations and live feed on offer

Proportion of ovulating ewes with multiple ovulations vs. Live pasture on offer (kg DM/ha)

- Live pre-grazing
- Live post-grazing
- Pre-grazing
- Post-grazing

Lucerne at Wagga Feb 2006 – flushed ewes!

EverGraze
More livestock from perennials
Green feed and flushing issues

• Coumestans in lucerne, high feed intake
  – Manageable risks, but need more info on feed intake d11-12 of preg and risk of embryo mortality

• Reliability of green feed being available
  – Argument for lucerne

• Unsynchronised ewes
  – 2010 trial and supporting sites

<table>
<thead>
<tr>
<th></th>
<th>Jugiong 2009</th>
<th>Bookham 2009</th>
<th>Wagga 2010</th>
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<tbody>
<tr>
<td>Lucerne</td>
<td>Control</td>
<td>Lucerne</td>
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</tr>
<tr>
<td>Twins %</td>
<td>44</td>
<td>34</td>
<td>67</td>
</tr>
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Key Message 4

• Consider shelter for lamb survival, depending on location and lambing time
Lamb survival and shelter 1

**XB lamb survival Wagga (2008/2009)**

<table>
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<th>Survival Rate</th>
<th>Shelter Type</th>
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<tbody>
<tr>
<td>82</td>
<td>Singles - hessian</td>
</tr>
<tr>
<td>70</td>
<td>Twins - hessian</td>
</tr>
<tr>
<td>78</td>
<td>Twins - shrub</td>
</tr>
</tbody>
</table>

- Singles - hessian shelter
- Twins - hessian shelter
- Twins - shrub shelter

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More livestock from perennials
Lamb survival and shelter 2

Twin survival at Hamilton 2008-2009

![Graph showing lamb survival and birthweight](image)

- Red line: No Shelter
- Blue line: Shelter

**Birthweight (kg)**

- Lamb survival (%)

### Twin survival at Hamilton 2008-2009
Likelihood of median daily chill index exceeding 1100 kJ/m².hr for 24 weekly periods from May to October

25 (○○○○○) % wind speed
50 (---▼--) % wind speed
75 (··∆··) % wind speed
100 (■■) % wind speed
Gross Margins for Wagga site

252mm 536mm 604mm 1185mm

20% Lucerne
40% Lucerne

Failed springs

2006 2007 2008 2009 2010 (p)