

The importance of perennial legumes for maintaining feed quality

Growing red meat productivity through the selection and establishment of perennial legumes

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Jock Hughes: *Jessiefield*, Longford

Background

Longford red meat producer, Jock Hughes, is growing a wide range of pasture mixes at his Longford property *Jessiefield*. As part of our growing red meat productivity through the selection and establishment of perennial legumes project, Jock has come on board as an Involve and Partner farm. We have been tracking the seasonal changes in feed quality for a range of pastures including ryegrass dominant, mixed ryegrass and clover and clover dominant pastures. Our main aim is to assess how the seasonal fluctuations in feed quality may be reduced by growing pastures that contain a higher legume content. Jock currently utilises a range of pasture mixes in his grazing rotation. Legume monoculture combinations of white and red clover are also sown in irrigated areas as these offer superior weight gain for lambs (achieving > 300 g/day in some situations) and complement weed management for his cropping rotations.

Identifying the main benefits of perennial legumes

As part of the current project, it is our aim to increase the perennial legume component in pastures from current levels of 12-15% to 20-25%. By doing this, we believe that red meat producers will increase both the profitability and productivity of their enterprises. The main advantages to increasing the legume content of pastures include:

- Increasing the feed quality of pastures and reducing the fluctuations in pasture quality as the grass component of a pasture turns reproductive. This equates to faster weight gain and healthier animals.
- Reducing the requirement for nitrogen fertiliser application. When growing conditions allow, legumes fix nitrogen from the atmosphere through their root system and make it available to other pasture species. This is reliant on successful inoculation of the seed/seedling with rhizobia.
- Perennial legumes have deeper root systems meaning that they are able to take advantage of large or unseasonal rainfall events as well as being more resilient during times of moisture stress.
- Legumes grown as monocultures can be utilised in cropping rotations to complement weed management strategies, particularly where crops require a grass free phase prior to planting.

Snapshot

- Jock Hughes, Cluden Newry Angus, Longford
- 1350 ha mixed cropping and grazing enterprise
- 200 ha of irrigated area
- 620 mm annual rainfall
- Growing a range of different forage crops and pasture mixes for fattening lambs and conditioning bulls



Left: Lambs grazing a legume and chicory pasture mix at *Jessiefield*; 14/11/2023.

Pasture composition from four different pastures at Jessiefield

Four feed tests were taken from paddocks containing differing species compositions. Figure 1 shows the species composition in the four paddocks that were tested. The grass component listed was mostly perennial ryegrass. It is evident that the pivot paddock and lucerne paddock are dominated by clovers, however the grass seed paddock does not contain legume. The little flat paddock contains 25% clover which falls within our project target of a 20-25% perennial legume component in perennial pastures. From here, we can determine and track how legume component affects the overall feed quality of a pasture through the growing seasons.

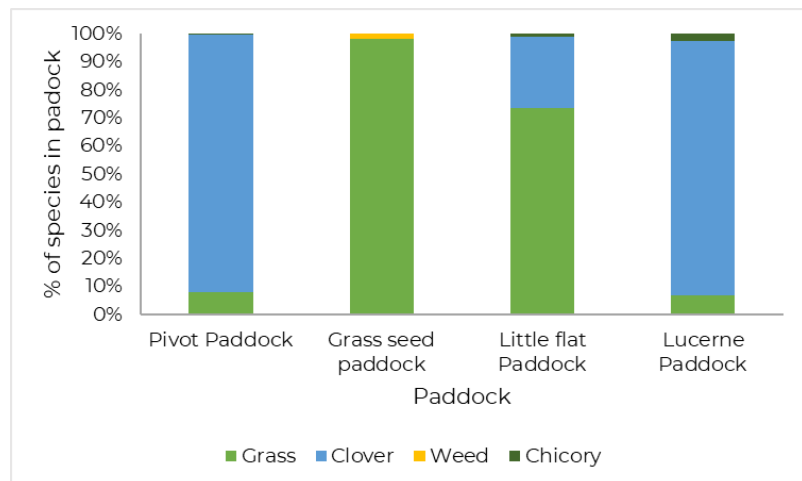


Figure 1: Pasture composition of the 4 pastures that were sampled for feed testing; 15/09/2023.

Feed quality

Feed tests were conducted on 15 September 2023 while the pastures were vegetative. The results are shown in Table 1. The standout findings from these results were the effect that legume content had on Neutral Detergent Fibre (NDF) and Crude Protein (CP). Crude protein increased as the clover content in pasture increased.

Table 1: Feed test results from four paddocks; 15/09/2023.

Paddock	NDF %	CP %	DMD %	ME MJ/kg DM	WSC %
Pivot pdk	25	30.1	84	13.0	7.9
Grass seed pdk	29	18.7	92	13.5	21.2
Little Flat pdk	35	24.8	83	12.5	10.1
Lucerne pdk	23	31.2	86	13.4	8.7

Take home messages

- Increasing legume content can increase the feed value of pastures.
- Producers should aim to increase their legume component in pastures to 20-25%.
- Pastures with higher legume content tended to have higher CP values and lower NDF values.
- Further feed testing will be conducted at *Jessiefield* to assess how legume content can reduce fluctuations in seasonal feed value.

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The pivot and lucerne paddocks were clover dominant and had the highest CP percentages. CP is a measure of the nitrogen content in feed. Animals that are actively growing have a greater requirement for protein in the diet compared to animals that are maintaining weight. Feeds with <6% CP are generally considered deficient and will limit rumen function.

Pastures with a high clover content had lower NDF values. NDF is an estimate of the percentage of total cell wall content in forages. Pastures containing a lower NDF value are usually better quality as they have higher levels of animal intake and thus animal weight gain. As part of our Involve and Partner activities, we will continue to take regular feed tests in these paddocks to assess how legume content changes feed quality through the growing seasons.

This project was co-funded with Meat & Livestock Australia. For more information please contact: Rowan.Smith@utas.edu.au or visit our project page www.utas.edu.au/tia/research/research-projects/projects/growing-red-meat-productivity-through-the-selection-and-establishment-of-perennial-legumes

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