

Evaluation of Forage Varieties in a Cropping System, 2010

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Location

MFMG Site, Frances SA

Acknowledgements

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Collaborating Farmers

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Summary of Findings

- A range of forage varieties were grown as rotational options at the MFMG site at Frances and Conmurra.
- At Conmurra and Frances, the highest DM producing forages were annual ryegrass; R2 tetraploid annual ryegrass (12.28t/ha DM) at Conmurra and Grassmax Diploid annual ryegrass (7.53t/ha DM), primarily due to their ability for a winter cut.
- The best annual clovers at both Conmurra and Frances include Zulu II Arrowleaf (6.46t/ha & 3.93t/ha) and Bolta Balansa (6.27t/ha & 4.11t/ha)
- The cereal/grass based options generally grew more DM and offered more competition but legume & broadleaf crops offered different herbicide options, disease breaks and in the case of legumes, nitrogen fixation.
- The legume & brassica varieties produce forage of a higher quality than that of cereals and grasses, which provides greater benefit to grazing animals.
- More work required to show possible yields, both as monocultures and as mixes for rotational options.

Background/Aim

Seedmark has been working for a number of years on alternative rotations in medium-high rainfall cropping. A wet 2010 saw the greater need for planting options other than cereals and canola to manage water logging, crop harvest risk, disease management and weed control issues. The consistent and attractive returns from livestock makes investment in pasture / forage options worthwhile.

The key seasonal points were;

- Disease Break- extreme wet conditions saw incidences of stripe and stem rust in major cereals, an almost complete breakdown of scald in some barley varieties

and presence of blackleg in canola. Offering another rotation to spread out these crops would be of benefit.

- **Herbicide Rotation**- without a doubt Wimmera Ryegrass is becoming a greater issue and if different herbicide groups can be used, or crops offer greater competition or are cut or grazed, this will help reduce the RG problem.
- **Nitrogen Fixation**- legumes offer some extra soil nitrogen, through soil rhizobia. A rough rule of thumb is 25kg/ha N for every 1t of forage produced.

Treatments

Paddock preparation: A randomized block design of 3 replicates, using 10m x 1.8m plots was used.

Sowing:	Frances SA (Canola 09)	Conmurra (Canola 09)
	13 May	29 May

Fertiliser: 75kg/ha MAP at sowing
100kg/ha Urea Broadcast 8 Sep 10 (All non-legumes)

Herbicide: 1L/ha Roundup Powermax + 2.0L/ha Triflur X IBS (except grasses) 23 July
500ml/ha Select + 1L/100L Hasten (Leafmore + Scimitar)
500ml/ha Select + 500ml/ha Agritane 750 + 1L/100L Hasten (Clovers)
2.5L/ha Butress (Cereals, Scimitar)

Cuts; 1. 21 Sep 2010. Cut whole plot, sub sample, dried and weighed for dry matter
2. 18/19th Nov 2010. Sub sample, dried and weighed for dry matter

GSR:	432mm	519mm(April- Nov)
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AR:	618mm	694mm(April- Nov)
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Varieties (brackets denote sowing rates)

Leafmore Forage Rape (5kg/ha)

Brassica's have traditionally been a spring sow option, but may have a fit for winter crop rotations, high quality stockfeeds- as a solo crop or in a mix. Leafmore has improved cold tolerance and quick regrowth post grazing. The natural bio-fumigant properties of a Brassica, combined with flexible grass control options, make it an alternative rotation.

R2 Annual Ryegrass (30kg/ha)

Annual tetraploid ryegrass. Large leafed ryegrass with exceptional winter growth. R2 offer's maximum competition with Wimmera Ryegrass, with ability to shade out and has exceptional re-grazing time. R2 is later flowering than products like Tetila, Tetrone etc. and provides high quality feed into early summer allowing it to take advantage of late season rainfall.

Grassmat Annual Ryegrass (20kg/ha)

Highly winter active diploid ryegrass. This ryegrass is densely tillered, making it an ideal hay rotation that actually out competes weeds, including Wimmera Ryegrass. Can be mixed with clovers to provide extra protein but is still susceptible to grass herbicides when the time comes to remove it for cropping.

Blaza Crimson Clover (10kg/ha)

Annual clover with early- medium growth habit. Suited to low fertility or opening a paddock up, Can provide good forage value and is a good component to add to pasture/forage blends especially when the paddock has light soil. Blaza is often used for aesthetic purposes due to its large crimson flower and contrasting foliage

Zulu II Arrowleaf Clover (10kg/ha)

Annual clover, with erect type clover. Ideal in mixes or to improve protein in hay mixes. Ideally suited to acid, loamy reasonably drained soils. Zulu, as shown in 2010, can produce a massive amount of top quality feed.

Laser Persian Clover (10kg/ha)

Late season Persian clover, with ability for multiple grazings and hay production. Large leafed with soft seed – ideal nitrogen fixer and forage option. Laser is able to produce well into summer or until moisture stops.

Elite Berseem (15kg/ha)

Erect type annual clover- with many growth habits similar to Lucerne. Good early growth, minimal winter production- large Dm production in spring. Anti-bloat properties with good hay production.

Bolta Balansa (5kg/ha)

Longer season, annual clover. Prolific growth with potential for good seed set, the season length of Bolta suits hay production very well. Tolerates heavier soils and some water logging.

Graza 51 (50kg/ha)

Highly vigorous, highly digestible forage oat. Winter active with upright growth habit- rapid growth and re-graze times.

Graza 80 (50kg/ha)

Vigorous forage oat, with high tiller density and maximum dry matter. Wide leaves with high WSC.

Scimitar (10kg/ha)

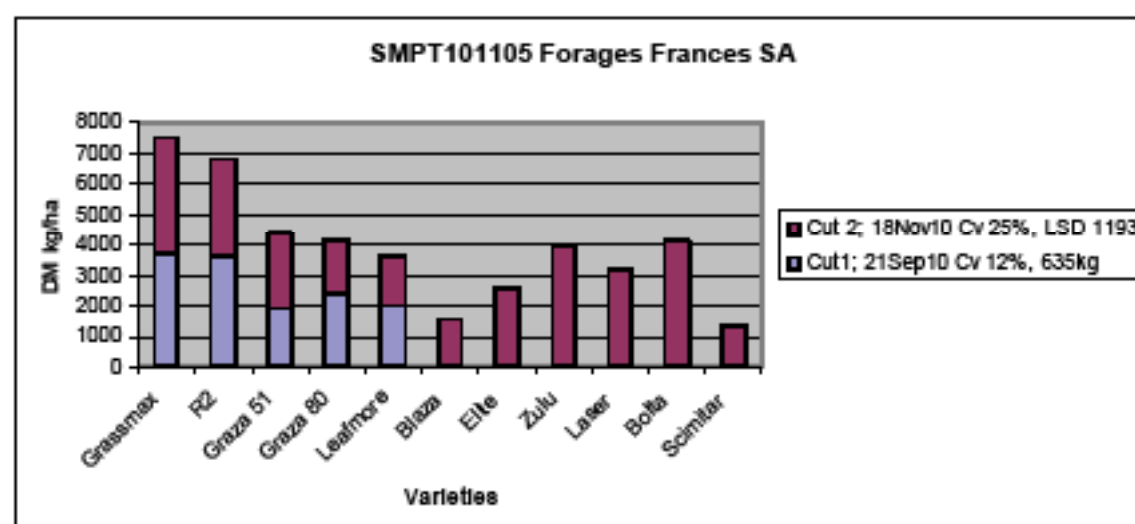
Spineless burr medic with prolific growth and some saline tolerance. Traditionally suited to low-medium rainfall and alkaline soils- the use of medics in higher rainfall systems is being evaluated.

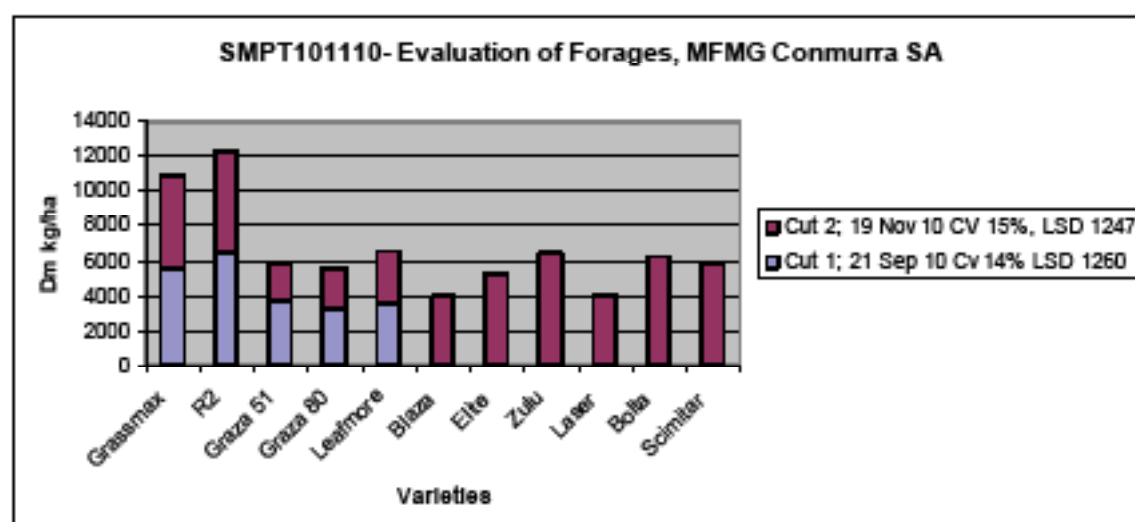
Results

Table 1: Dry Matter Yield

Variety	Frances t/ha DM	Significant Diff	Connarra t/ha DM	Significant Diff
Grassmax Dip Annual Rye	7.530	a	10.887	b
R2 Tel Annual Rye	8.787	a	12.287	a
Graza 51 Forage oat	4.358	b	5.573	c
Graza 80 Forage oat	4.024	b	5.552	c
Leafmore Forage Rape	3.802	b	8.557	c
Blaza Crimson Clover	1.548	cd	3.888	d
Elite Berseem Clover	2.553	cd	5.249	c
Zulu Arrowleaf Clover	3.937	b	8.426	c
Laser Persian Clover	3.188	bc	4.014	d
Bolta Balansa Clover	4.112	b	8.247	c
Scimitar Burr Medic	1.358	d	5.804	c
CV	13%		18 %	

Figure 1: Evaluation of Forage Varieties (Kg of DM/ha)





Discussion

2010 started with such promise with a decent April break and good sowing conditions. Establishment at both sites was excellent with good plant populations and minimal insect or weed interference. The site at Conmurra appeared to have higher levels of fertility and this allowed varieties such as R2 tetraploid ryegrass and Leafmore forage rape to really show their generic merit with winter production. The Frances site, also established well but heading into the heavy wet winter—some species showed less water logging tolerance. While the ryegrasses, Zulu II and Bolta, thrived in the moisture, Elite, Blaza and Scimitar did not. The well-drained soil of Conmurra—saw extended season production with larger amounts of dry matter being produced.

The trials once again showed very large quantities of dry matter can be grown, over 12t, in a dry land situation. Annual ryegrass has a real fit for early growth and weed competition. They compete readily with Wimmera Ryegrass, have better dry matter production and can reduce Wimmera seed set. Feed test work at other sites shows high protein (>14%) and energy (12MJ/kg DM).

Forage legumes also have a real fit with over 6t of dry matter being produced by Zulu II Arrowleaf clover, while Bolta Balansa Clover and Laser Persian Clover also produced well.

For the second year in a row, Zulu Arrowleaf and Bolta Balansa topped the annual clovers. This seems to be due to their early vigor out of the ground, their erect type growth to compete, a higher tolerance to post emergent herbicides and late season dry matter production. Further work needs to be done to evaluate their performance at high seeding rates (e.g. HDL mixes) and in grass/cereal mixes. For this reason, these mixes will have been included in the 2011 sowings.

Leafmore showed very strong establishment and good early growth although a background of canola did not help. Like all forage Brassica's, Leafmore has low blackleg tolerance. The first cut was also very harsh on Leafmore as it was later than planned (due to the wet season) and the stems were too well developed to handle the mower. For this reason Leafmore has been included in this year's trials.

The forage cereals didn't perform as well as expected, primarily as they didn't respond well although Graza 80 has been included again this year as these results were contradicted in other areas.

Summary

With increasing pressure on rotations, there are a number of forage options that can be considered;

- On higher fertility sites, with better N levels- annual ryegrass such as R2 and Grassmax are very productive options and can out produce forage cereals.
 - Brassica's (Leafmore) should be avoided on canola stubble.
 - On lower N sites, Zulu Arrowleaf clover and Bolta Balansa grow reasonable hay and fix Nitrogen. These may also be used in combination with sub clover to boost production.
 - Further work needs to be conducted to understand the benefit of competition against weed species (esp with Wimmera RG) and yield benefits to following crops.
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