

### 6.3 Evaluation of Forage Varieties in a Cropping System - Lake Bolac, Vic

**Location:** Lake Bolac Research Site.

**Funding:**

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**Background/Aim:**

Following on from work by Seedmark in the last 2 years, it was determined that more data needed to be collected to establish dry matter and production figures. The main reasons for alternative rotations are;

- Disease Break - 2009 saw blackleg in canola, scald in barley, septoria in oats and stripe rust in wheat in a prevalence not seen since the wet winters of old. Extending gaps in rotation will reduce stubble and inoculum levels, assisting disease control
- 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 are cut or grazed, this will help reduce the ryegrass 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.

**References:**

Ferris, D.G. (2007) Evolutionary differentiation in *Lolium L.* (Ryegrass) in response to the Mediterranean type climate and change to farming systems of Western Australia, University of Western Australia.

**Summary of findings:**

- A range of cereal, grass, vetch, brassica and clover varieties were selected for their suitability in medium-high rainfall zones in a forage break in cropping rotations.
- In 2009 and 2010, specialist forage oats (Graza 51 and Graza 80) and annual ryegrasses (Grassmax & Drummer) grew the largest amounts of dry matter
- In 2009 Morava vetch grew the highest amount of dry matter for legumes, whilst in 2010 it was Zulu II arrowleaf clover
- In 2010, the site was extremely wet, and some varieties performed better than others. If 2011 also proves to be wet, growers need to carefully select their varieties.



**Figure 1:** Zulu II Arrowleaf Clover

**Paddock Preparation:**

A randomized block design of 4 replicates, using 20m x 1.8m plots was used.

**Sowing:** 7 May 2010

**Fertiliser:**

- 75kg/ha MAP at sowing
- 20 Sep: Cereals, Grasses, Brassica; 100kg/ha Urea. Clovers, Vetch, Medic; 100kg/ha Tunza Fodder (11:8:19:6)

**Pesticide:**

12 Jun 10; 100ml Fastac + 100ml Dimethoate

**Herbicides:**

- Knockdown: Roundup & Hammer
- Pre Emergent: 2.0L/ha Triflur X IBS

**Cuts:**

- Cut 1: 28 Sep 10; Whole Plot
- Cut 2: 2 Dec 10; Whole Plots

**Varieties** (Brackets denotes sowing rates):

- **Leafmore Forage Rape** (5kg/ha)- Brassicas 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 biofumigant properties of a brassica, combined with flexible grass control options, make it an alternative rotation.
- **Morava Vetch** (40kg/ha)- Mid long season, common vetch, with nil hard seed. Ideal hay option to produce large amounts of bulk, assist in control of Wimmera ryegrass and produce high protein feed that is in high demand by dairy farmers. Traditionally it has been suited to medium rainfall cropping zones and alkaline soils. Vetch tends not to handle wet cold winters and acid soils as well as some other forage legumes.
- **Rasina Vetch** (40kg/ha) Early season common vetch, that also has nil hard seed for cropping rotations. Significantly shorter in season length than Morava, it is suited to later sowing or early finish for ryegrass topping. These vetches suited to hay/ green manuring rather than grazing.
- **Drummer Annual Ryegrass** (30kg/ha) Annual tetraploid ryegrass. Large leafed ryegrass with exceptional winter growth. Offers maximum competition with Wimmera Ryegrass, with ability to shade out and also exceptional regrazing time.
- **Grassmax Annual Ryegrass** (20kg/ha) Highly winter active diploid ryegrass. This ryegrass is densely tillered, making it an ideal hay rotation that actually outcompetes weeds, including Wimmera Ryegrass. Can be mixed with clovers to provide extra protein, and is still susceptible to grass herbicides when the time comes to remove it for cropping.
- **Scimitar Burr Medic** (10kg/ha) Winter active, early mid spineless burr medic. Generally suited to higher pH soil, lower-medium rainfall zone. Some tolerance of salinity.
- **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.
- **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.
- **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 regrazing times.
- **Graza 80** (50kg/ha) Vigorous forage oat, with high tiller density and maximum dry matter. Wide leaves with high WSC.

**Table 1:** Dry Matter Yield (2010 vs 2009)

| Variety                     | Lake Bolac 2010 |             | Mininera 2009 |             | Mininera 2008 |
|-----------------------------|-----------------|-------------|---------------|-------------|---------------|
|                             | t/ha DM         | Signif Diff | t/ha DM       | Signif Diff | t/ha DM       |
| Leafmore Forage Rape        | 2.779           | c           | 3.195         | fhg         | 3.297         |
| Rasina Vetch                | 1.091           |             | 4.496         | def         | 2.941         |
| Morava Vetch                | 1.104           |             | 4.828         | de          | 2.688         |
| Drummer Tetraploid Ryegrass | 5.133           | a           |               |             |               |
| Grassmax Diploid Ryegrass   | 4.620           | a           | 8.403         | bc          | 4.697         |
| Graza 51 Forage Oat         | 4.288           | ab          | 8.904         | ab          | 5.310         |
| Graza 80 Forage Oat         | 3.614           | bc          | 10.067        | a           |               |
| Laser Persian Clover        | 1.495           | c           |               |             |               |
| Zulu II Arrowleaf Clover    | 2.076           |             | 4.480         | def         | 2.076         |
| Bolta Balansa               | 1.740           |             | 2.682         | hij         | 1.740         |
| Scimitar Burr Medic         | 1.174           |             |               |             |               |
| CV                          | 14%             |             | 8.75%         |             | 22%           |
| LSD                         | .887            |             | .890          |             | .856          |

**Discussion:**

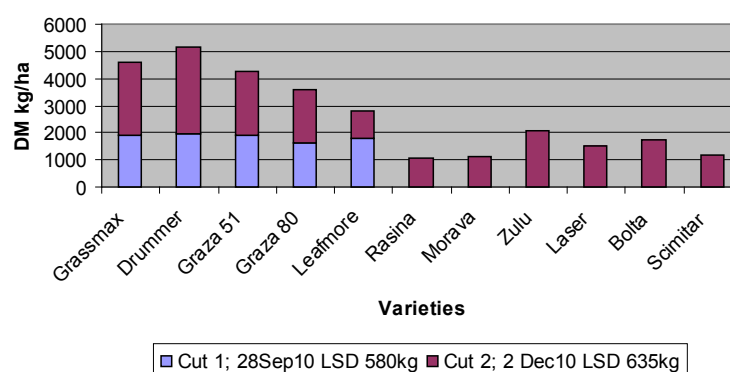
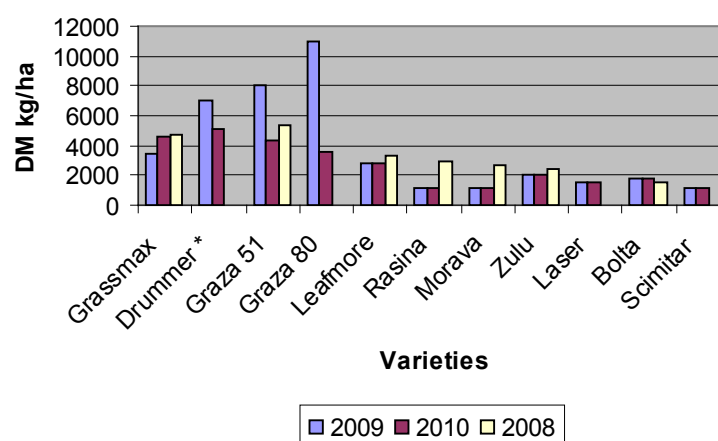
As in 2009, grasses and cereals grew the largest amounts of dry matter, especially in the winter. This not only offers greater production gains (especially when mixed farming operations suffer their biggest feed demand) but also greater weed competition and ground cover. This occurred despite the fact Trifluralin was used to combat ryegrass & wireweed in the canola stubble (not registered in these crops), and some damage also occurred to the annual ryegrasses in the row. The continuing trend of highly performing tetraploid ryegrass (Eg Drummer) is promising, considering its high feed quality. Work out of WA (Ferris, 2007) is showing use of an early flowering tetraploid amongst a population of Wimmera ryegrass (diploid) will rapidly reduce resistant populations.

Unfortunately, again in 2010, the broadleaf forages did not perform as well as the cereals and grasses. This was due in part to the extreme waterlogging of the site- which particularly affected species like vetch and arrowleaf clover. If the paddock was better drained then dry matter production of these would be much better; If one compares 2009, where Zulu not only yielded 4t/ha, and probably fixed 200kg/ha N for the following crop- then 2010 with wet feet only produced 2t/ha. Bolta Balansa and Laser Persian clover also failed to produce dry matter- which seems unusual. Greater use of medics in higher rainfall zones, was the motive for trying in 2010- but from these results seems unlikely to produce high dry matter. Ryegrass control was good in broadleaf crops, and when you couple this with nitrogen fixed, it will be interesting to see crop response to the following rotation in 2011.

**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- forage cereals such as Graza 80 and 51 are an option
- Brassicas (Leafmore) should be avoided on canola stubble
- On lower fertility sites, legumes such as Rasina and Morava Vetch and Zulu Arrowleaf clover grew reasonable hay and fixed Nitrogen (on well drained soils)
- On heavier soils Bolta Balansa and Laser Persian Clover maybe better suited.
- Further work needs to be conducted to evaluate competition value (esp with Wimmera ryegrass) and subsequent yield benefits to following crops.

**SMPT101107 Forage Mixes, SFS Site Lake Bolac 2010****Figure 3:** Comparison of Forages in 2008, 2009 and 2010**Evaluation of Forages, SFS Mininera & Lake Bolac 2008, 2009 & 2010****Figure 2:** Evaluation of Forage Varieties at SFS lake Bolac 2010 (Kg of DM/ha)