

## 6.2 Evaluation of forage varieties in a cropping system - Mininera & Dunkeld, Vic

### Location:

Mininera & Dunkeld Research Site's.

### Researchers/Authors:

Cam Conboy, PlantTech

E: cconboy@planttech.com.au

P: 0428 134 796

Reece Hardwidge, Seedmark,  
PlantTech

E: rhardwidge@planttech.com.au

P: 0428 178 719

### Acknowledgements:

SFS, Rohan Wardle & Toby Campbell

### Background/Aim:

Following on from work by Seedmark PlantTech in 2008, there is investigation in using alternative crops in medium to high rainfall zones. It was determined that more data needed to be collected to establish dry matter and production in these zones. 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 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.

### Take home messages:

- A range of forage varieties were grown as rotational options at SFS Mininera and Dunkeld Sites
- At Mininera, a relatively well drained and high fertility site, Graza 80 Forage Oats (10.06t/ha DM), Graza 51 Forage Oats (8.9t/ha DM) and Grassmax Annual Diploid Ryegrass (8.4t/ha DM) produced the highest forage yields.
- At Dunkeld, a wetter site and lower fertility and cropping history, Leafmore Forage Rape (6.6t/ha DM) Rasina Vetch (6.1t/ha DM) Graza 51 Oats (6.3t/ha DM) and Mitika (6.4t/ha DM) were the highest forage yields.
- The cereal/grass based options grew more DM and offered more competition, but legume & broadleaf crops offered different herbicide options, disease breaks and in case of legumes, nitrogen fixation.
- More work required to show possible yields, both as monocultures and as mixes for rotational options

### Paddock Preparation:

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

### Sowing:

Mininera: 15 May 2009

Dunkeld: 14 May 2009

### Fertiliser:

75kg/ha MAP Evolite at sowing

### Pesticide:

11 Jun 09 - 100ml Fastac + 100ml Dimethoate

### Herbicides:

Knockdown; Roundup & Hammer; Rape & Vetch; 18 Aug 09 Liase + Verdict 520 + Select + Hasten Clover; + Raptor

### Cuts:

Mininera - 24 Nov - Cut whole plot, dry matter

Dunkeld - 11 Nov

2009 GSR: 465mm (Mininera)

529 mm (Dunkeld)

2009 Avg: 535mm (Mininera)

624 mmm (Dunkeld)



Dunkeld site.

Varieties	Sowing Rate	Characteristics
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 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.
Popany Vetch	(40kg/ha)	Late flowering purple flowered vetch. Broadly adapted hay option, with lower levels of hard seed. Outclassed by Morava.
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.
Haymaker Vetch	(40kg/ha)	Longer season wooly pod vetch, with level of hard seedness. Good disease resistance, with ability to handle wetter and colder conditions better than common vetches. Suitable for grazing, green manuring, hay and silage.
Mitika Oats	(100kg/ha)	Premium milling grain, dwarf oat. Mitika have a higher groat percentage and less lignin, making grain far more efficient for milling or stockfeed. Whilst forage oat varieties, such as Graza 51, will out yield for straight forage- examining opportunities from a grain and graze point of view.
Eaglehawk	(100kg/ha)	APW quality long season spring wheat. High seedling vigour with early growth and high DM potential. Suitable for winter graze and grain and graze possibilities.
Gairdner	(100kg/ha)	Long season malting barley that has been used in a number of situations for grain and graze. Ability to grow dry matter earlier in the season, with minimal yield impact if locked up prior to GS32.
R2 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 regrowth time.
Grassmax 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, and is still susceptible to grass herbicides when the time comes to remove it for cropping.
Elite Berseem Clover	(10kg/ha)	Winter active, upright annual clover, with a late spring flush of growth. Ideal for hay production with good clover scorch tolerance and not known to cause bloat.
Blaza Crimson Clover	(10kg/ha)	Annual clover with early- medium growth habit. Suited to low fertility or opening a paddock up, Blaza is a low prostate clover.
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 regrowth times.
Graza 80	(50kg/ha)	Vigorous forage oat, with high tiller density and maximum dry matter. Wide leaves with high WSC.

### Results and Discussion:

The 2009 season was a reasonable growth year for forages and pasture legumes. A reasonable break and mild winter, meant good winter and spring growth- despite a heatwave in early November. In essence the Mininera site had better fertility and cropping history- the forage cereals and grasses performed better. In a hay scenario- the Graza 80 & 51 provided large amounts of dry matter, competed with weeds extremely well and provided a good option. If multiple cuts and harder grazing was undertaken, the both the Grassmax and R2 grasses would have provided more dry matter. Interestingly, grain varieties such as Mitika, Eaglehawk and Gairdner also provided large amounts of dry matter- but were cut after GS32- so no use as grain

in this scenario. Being a reasonably well drained site, legume such as Morava Vetch and Zulu II Arrowleaf clover, performed exceptionally well. The poor performance of autumn sown brassica can be attributed to background blackleg from previous canola crop. On the other hand Dunkeld was a virgin pasture site, with lower fertility and a poor soil structure- it was extremely wet in winter. In some cases, some forages didn't respond well after cutting and the wet. Brassicas performed better, as surprisingly did a shorter season common vetch, Rasina- but cereals and grasses hit a Nitrogen deficiency before fulfilling their genetic potential (in Gairdners case- leaf scald infection was high).

**Table 1:** Dry Matter Yield

Variety	Mininera		Dunkeld	
	t/ha DM	Signif Diff	t/ha DM	Signif Diff
Leafmore Forage Rape	3.195	fgh	6.640	a
Rasina Vetch	4.496	def	6.108	a
Morava Vetch	4.828	de		
Popany Vetch	4.775	de		
Haymaker Vetch	3.669	efg	3.263	a
Mitika Oats	7.903	abc	6.630	a
Eaglehawk Wheat	8.375	ab	4.162	a
Gairdner Barley	6.201	cd	2.674	a
Elite Berseem Clover	1.324	j		
R2 Tetraploid Ryegrass	7.020	ghi		
Grassmax Diploid Ryegrass	8.403	bc		
Graza 51 Forage Oat	8.904	ab		
Graza 80 Forage Oat	10.067	a		
Blaza Crimson Clover	1.837	ij		
Zulu II Arrowleaf Clover	4.480	def		
Bolta Balansa	2.682	hij		
CV	8.75%		5.52 %	
LSD	.890		158	

Means followed by the same letter do not significantly differ.

### 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 grow reasonable hay and fix Nitrogen
- Further work needs to be conducted to evaluate competition value (esp with Wimmera RG) and yield benefits to following crops.

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

