

6.3 Evaluation of sub clover varieties in a cropping system - Mininera, Vic

Location: Mininera Research Site.

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Background/Aim:

Sub clover has long been a base legume of cropping systems in Western Victoria, being well suited to the acidic, buckshot loam soils. The base of this system has been Trikkala Sub Clover, however in recent years, newer varieties have different season lengths and improved DM production. Sub clover, not only increases protein and feed quality in forage, but adds Nitrogen to the grazing/cropping system. A general rule of thumb has been to suggest that sub clover can fix between 20-30kg/ha of N per 1t/Dm fixed- so that the more biomass one can grow- the more nitrogen can be fixed.

Take home messages:

- Antas Sub Clover (brachycalium type) grew significantly more DM (3.697t/ha) than other sub clovers, and more than twice the production of Trikkala (1.735 t/ha DM)
- The more biomass you grow, the more Nitrogen you fix. Using rules of thumb (25kg/ha N per 1t DM), Antas would fix 92kg/ha of N cf 43kg/ha N for Trikkala.
- A later sowing combined with a dry spring produced some variances, and lower DM yields than expected.
- More work is required to show possible yields, both as monocultures and as mixes for rotational options

Rainfall:

Avg. Annual: 589.7mm, Ararat Prison 1969-2008

Avg. G.S.R.: 449.4mm, Ararat Prison 1969-2008

2008 Total: 534.0mm, Mininera Research Site

2008 G.S.R.: April – November = 330.5mm

Paddock Preparation: burnt wheat stubble

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

Sowing: 14/5/08 - Direct drilled using SFS cone seeder. 10kg/ha Clover seed Agristrike coated with Gaucho

Fertiliser: 75kg/ha MAP at sowing

Pesticide: 3/7/08 - Fastac + Dimethoate- For extreme Lucerne Flea and Aphid pressure
Clover- Verdict/Select- Wimmera Rye, Vol Cereals
Clover- Broadstrike/Buttress

Cuts: 4/11/08 - Cut whole plot, weigh. 100g Sample dried and weighed. DM calculated. pH (CaCl₂) = 4.7

Table 1: Summary of sub clover varieties

Variety	Spp	Seed Colour	Rainfall Zone	Maturity	Days to Flower	Hay	Grazing	Grain/Seed
Losa	Sub	Black S	350-650	Early	97	Y	Y	N
Campeda	Sub	Black S	400-700+	Mid	123	Y	Y	N
Trikkala	Yannicum	White	400-700	Mid	112	Y	Y	N
Riverina	Yannicum	White	400-700	Mid	116	Y	Y	N
Gosse	Yannicum	White	500-800+	Mid	126	Y	Y	N
Antas	Brachy	Black S	450-800+	Mid-Late	134	Y	Y	N
Denmark	Sub	Black S	500-850+	Late	144	Y	Y	N
Napier	Yannicum	White	600-850	Late	140	Y	Y	N
Leura	Sub	Black S	600-850+	Late	151	Y	Y	N

Discussion:

Despite a tough season, and a relatively poor one in terms of sub clover growth, there were some interesting results. One would suggest that rainfall was the major limiting factor in reducing yields, and that in fact with limited rainfall during the spring, it was amazing sub clover grew at all. The stand out performer, however was a brachycalium, black seeded sub clover- Antas. This variety has a large seed, with exceptional vigour. In turn this produces a large leaf and many stolons, which seems to use winter sun to produce dry matter while there is moisture available. This is surprising, as brachycalium types are generally suited to neutral to alkaline soils, when compared to standard subteranneums or yannicum types.

Secondly, it was initially thought that shorter varieties (eg Losa, Campeda) may perform better than longer season varieties. However there was no real trend indicated with the top 3 clovers at varying day length. Antas (134 days), Napier (140 days) and Gosse (126 days). Grass and broadleaf weed control was relatively simple, some of the clovers could have been spraytopped with paraquat, had the need arisen.

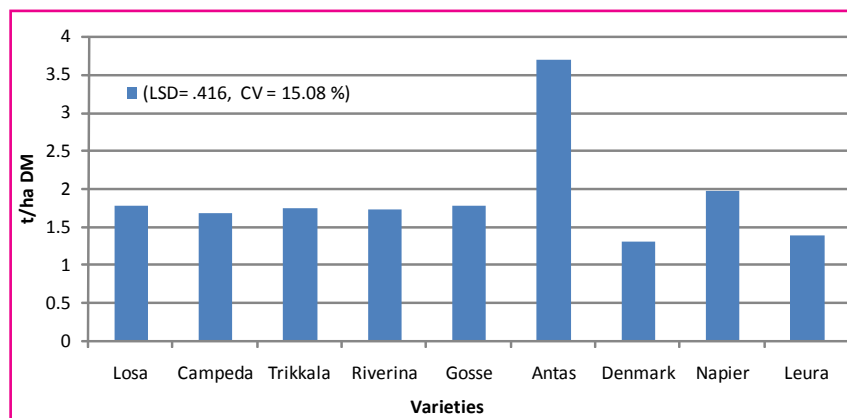
Results:**Table 1:** Dry matter yield (4 Nov 2008)

Variety	t/ha DM	Sig Diff
Losa	1.775	Bc
Campeda	1.676	Bcd
Trikkala	1.735	Bc
Riverina	1.717	Bc
Gosse	1.778	Bc
Antas	3.697	A
Denmark	1.298	D
Napier	1.974	B
Leura	1.375	Cd
CV = 15%		
LSD= .416 (P=0.05)		

Means followed by the same letter do not significantly differ.

Summary:

Further work is needed to develop how these subs will fit into cropping/ grazing systems. Cropping systems in Western Victoria need to consider rotations for weed, disease and Nitrogen breaks. It will be interesting to see how many of these varieties have seeded down, and degrees of regeneration. Upcoming trials should reassess dry matter with earlier sowing dates, as well as nitrogen fixation rates, assessing sub clover as a viable break crop/ grazing option. In addition further work needs to be done with companion species and blends, to increase production and nitrogen fixation.

**Figure 1:** Evaluation of sub clover varieties (t of DM/ha)