Evaluation of Sub Clover Varieties in a Cropping System

Location; SFS Mininera

Author & Researcher; Cam Conboy, Seedmark PlantTech
cconboy@planttech.com.au, 0428 134 796
Reece Hardwidge, Seedmark PlantTech
rhardwidge@planttech.com.au 0428 178 719

Acknowledgements; Martin and Kirsty Flower, Colloborating Farmers
MFMG, Krysteen McElroy
SARDI, Jack Kay
Seedmark, Shane Ebert

Summary of Findings

- Antas Sub Clover (brachycalnium type) grew significantly more DM than its than other sub clovers, (3227kg/ha DM)- a 58% increase in dry matter on Trikkala.
- The more biomass you grow, the more Nitrogen you fix. Using rules of thumb (25kg/ha N per 1t DM).
- Generally speaking earlier flowering varieties will grow more dry matter early, while later flowering varieties will make most of late rains. In practice a spread or mix of flowering dates may be prudent in a paddock situation.
- More work required to show possible yields, both as monocultures and as mixes for rotational options

Background/Aim

Sub clover has long been a base legume of cropping systems in Southern Victoria/South Eastern South Australia, 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.

Methods/ Treatments

Paddock Preparation

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

	Frances SA	(TT Canola 08)
Sowing;	28 May	

Fertiliser; 100kg/ha MAP at sowing

Pesticide; 11 Jun 09; 100ml Fastac + 100ml Dimethoate

Herbicide; Knockdown; Roundup & Hammer

Clovers + Rape ; 19 Aug 09; Liase + Verdict 520 + Select + Hasten

Clovers & Grasses; 19 Aug 09; Tigrex

Cuts; 28 Sep 09- Cut whole plot, Sub sample, dried and weighed for dry matter

GSR; 437 mm (April- Nov)

AR 489 mm

Varieties

Table 1; Summary of Sub Clover Varieties

Variety	Spp	Seed Colour	Rainfall Zone	Maturity	Days to Flower	Hay	Grazing	Grain/Seed
Losa	Subteranneum	Black S	350-650	Early	97	Y	Y	N
Seaton Park	Sub	Black	475-700	Mid	112	Y	Y	N
Campeda	Sub.	Black S	400-700+	Mid	123	Y	Y	N
Trikkala	Yannicum	White	400-700	Mid	112	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

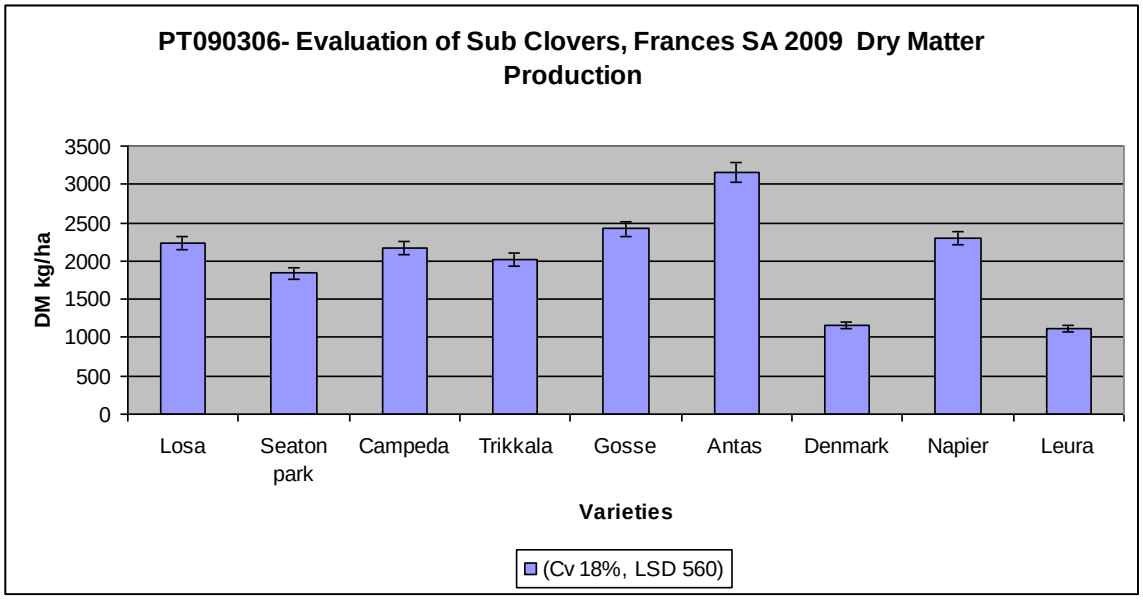
Results

Table 1; Dry Matter Yield

Variety	Frances	
	t/ha DM	Significant Diff
Losa	2.253	b
Seaton Park	1.878	bc
Campeda	2.251	b
Trikkala	2.043	b
Gosse	2.524	b

Antas	3.227	a
Denmark	1.341	c
Napier	2.359	bc
Leura	1.277	c
CV	18 %	
LSD	561	

Figure 1; Evaluation of Sub Clover Varieties (t of DM/ha)



Discussion

At the Frances site Antas has produced large amounts of dry matter, as it has at several other sites across southern Australia. There is a growing weight of evidence to suggest that it performs across a broad range of pH and soil types and consistently produces large amounts of dry matter. A brachycalcinum sub, it is large seeded with large leaflets- that has good early seedling vigour. This means it grows well heading into winter, even through waterlogged soil- and had many stolons with the large leaf shows big DM improvements on other varieties. Second year trials at other locations, have shown despite Antas being somewhat an aerial seeder, it does seed down and produces leading dry matter in its second year also.

In terms of other sub Clovers, Early subs such as Losa and Campeda performed well, being able to grow through a wet winter- and picked up well by a September cut. Gosse has grown more dry matter than Trikkala, though not signifcantly- and its mid season maturity has suited this site well. Interestingly later season varieties such as Napier and Leura have done well at Dunkeld- maybe with extra moisture.

The site contained heavy populations of wimmera ryegrass and wild radish- of which were able to be sprayed out. This offered a another measure of weed control, and some nitrogen fixed. As follow up work it would be interesting to see a cereal oversown on both the forage and sub clover plots- to see what N and crop yield would be. Further work needs to be done- on both pure stands, maturity mixes (Ie Early/Mid/Late) and mixed with grasses/cereals.

Summary

Further work needs to develop how these subs will fit into cropping/grazing systems. Cropping systems in South Eastern SA 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.