7. PULSE VARIETY TRIALS

7.1 GRAIN LEGUME VARIETY EVALUATIONS - FABA BEANS TASMANIA

Locations: "Willow Vale", Nile
"Riccarton", Campbell Town, Tas

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Acknowledgements: GRDC and cooperating growers -Rob Bradley and Crosby Lyne.

Growing season rainfall (April-Nov):
Willow Vale 488mm
Riccarton 324mm

Background:
There is an important role for a grain legume break crop in the cropping rotation. To date there has been limited success with obtaining profitable yields from grain legumes in the higher rainfall areas. Newer varieties and improved management practices offer new potential. With good disease control faba beans have shown excellent yields and there has been some tolerance of waterlogging. Peas sown late enough to avoid frost and waterlogging damage have also yielded well.

Aim:
To evaluate a range of new varieties of grain legumes under improved management conditions.

Methodology:
Faba beans, field peas, lentils and chickpeas were grown at one or both sites. Only data from faba beans is presented here as other crops are still being harvested at the time of writing or data is still being processed.

Grain yields were measured as well as assessments of early vigour, disease resistance, time of flowering and degree of lodging/standing ability. Trials were sown on flat ground with adequate drainage, not raised beds.

Sowing date:
Nile 9th May 2003
Campbell Town 6th May 2003

Seeding rate:
Nile Target density of 20 (large seeded) - 45 (small) plants/m²
Campbell Town Target density of 15 (large seeded) - 35 (small) plants/m²

Harvest date:
Nile 30th Dec 2003
Campbell Town 29th Dec 2003

Fertiliser:
Symmons Plains 250kg/ha 4:13:7:9 + Mo
Campbell Town 150kg/ha 4:13:7:9 + Mo

Weed Control:

Nile	PSPE - Stomp 2l/ha, Gesatop 2l/ha (faba beans), Post-em - Fusilade 500ml/ha
Campbell Town	Pre-em - Treflan 1.5l/ha PSPE - Stomp 2l/ha, Gesatop 2l/ha (faba beans), Post-em - Fusilade 500ml/ha

Pest Control: Le-mat 50ml/ha
Faba beans: Bravo @ 2.5l/ha x 2 applications

Results and Discussion:

There was an early break to the season allowing timely sowing and good early growth. Winter rainfall was above average at both sites (decile 7) but rainfall at Nile was very high in June (decile 10) setting up the wettest winter for over 50 years. Despite this, waterlogging damage at the trial site was minimal. After early October the rainfall switched off and there was an exceptionally dry finish to the season (decile 1). Overall it was a particularly tough cropping season.

The lack of finishing rains had a large impact on grain yield. Yield of Fiesta was over 25% lower than the long term average (1998-2003). However, considering the low rainfall the faba beans exploited available water at Campbell Town with a water use efficiency of 13.7 kg/mm/ha. At Nile the efficiency was much lower due to the high surface run-off over winter and low depth of topsoil and stored moisture.

Table 65: Faba Bean Yields from Replicated Plots at Nile and Campbell Town

Line	Nile		Campbell Town		Mean	
	Yield (t/ha)	% Fiesta	Yield (t/ha)	% Fiesta	Yield (t/ha)	% Fiesta
1057/1T	3.82	101.2	3.36	111.3	3.59	106.3
I*A7/6B	3.95	104.7			3.95	104.7
1060	3.73	98.9	3.29	109.0	3.51	103.9
S95007/1	3.90	103.4			3.90	103.4
FIORD	3.93	104.1	3.10	102.6	3.51	103.3
735*683/18	3.84	101.7			3.84	101.7
483/3	3.71	98.3	3.16	104.5	3.43	101.4
FIESTA	3.77	100.0	3.02	100.0	3.40	100.0
I*A 56/1B	3.76	99.7	2.88	95.4	3.32	97.5
I*A 7/3	3.53	93.6	3.02	99.8	3.27	96.7
A*610-27/3	3.70	98.1	2.86	94.6	3.28	96.4
S95005/14	3.50	92.7			3.50	92.7
CAIRO	3.65	96.8	2.61	86.5	3.13	91.6
735*683/17	3.31	87.8			3.31	87.8
TICK BEAN 'R'			2.48	82.2	2.48	82.2
TICK BEAN 'G'			2.21	73.1	2.21	73.1
mean yield	**3.72**		**2.91**			
LSD (0.05)	**nsd**		**0.37**			
CV	**7.8**		**7.4**			

There were no significant differences in grain yield between lines at Nile. Ascochyta disease pressure over the season was low and kept in check with two fungicide sprays. Cooler conditions at Campbell Town resulted in less disease and this probably influenced results with more susceptible types such as 1057/1 and 1060 performing relatively well at this site. These 2 lines being later maturing would also have benefited from a 30mm rain in mid November at Campbell Town, however the yield of other late material ie broad and tick bean lines did not appear to respond. Aquadulce was nearly 10% lower than the long term average and two local tick bean lines (used for horse rations) were 3 weeks later in flowering and suffered from the dry finish. Both tick beans were also particularly susceptible to ascochyta as it is unlikely there has been any breeding for resistance. The material is similar in maturity to an English line evaluated several years ago that was consistently 3 weeks later.

Fiord performed relatively well in 2003/04 (long term average 93% Fiesta). The dry finish to the season benefited Fiord relative to other lines. In addition the early sowing resulted in taller plants and in the case of Fiord, greater height and harvesting of lower pods than usual. Conversely shading in some of the higher biomass lines such as IxA56/1B and Fiesta may have reduced pod set of lower inflorescences.

Ascot and Manafest, as in previous years, yielded around 10% lower than Fiesta in observation plots (data not presented).

Conclusions:

Faba bean yields were adversely affected by the dry finish. The long term average of Fiesta is 4.7t/ha whereas last season it was 3.4t/ha. In several seasons with good spring rains the yield of Fiesta has been above 6t/ha in the Nile area.

The wet winter conditions in 2003 clearly demonstrated the waterlogging tolerance of faba beans relative to other grain legumes. In some commercial crops, faba beans tolerated the waterlogging as well as winter wheat (or as poorly as wheat depending on your perspective!).

Faba beans should be developed as a substitute for lupins in stock rations in Tasmania ie. ignore the seed size and colour characteristics required for human consumption markets and concentrate on breeding for yield and disease resistance.

In a dry finish tick beans require a price premium over faba beans to remain economic.