

### 3.6.2 PBA Faba bean variety trial - Lake Bolac, Vic

**Location:** SFS Lake Bolac Research Site

**Funding:**

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**Summary of findings:**

- The faba beans produced lower yields in 2011 than in the previous two years, but the overall trial yield of almost 3t/ha indicates their potential as a crop in the Western Districts.
- The three major faba bean varieties, Farah, Fiesta VF and Nura produced comparable yields in 2009, 2010 and 2011. There is little difference between the three varieties for chocolate spot, but Farah and Nura are both MR-R to Ascochyta blight whereas Fiesta VF is MS-MR, so Farah and Nura would be the preferred varieties for the district.
- The new faba bean variety PBA Rana yielded similarly to the other varieties in 2009, less in 2010 and more in 2011, with the average yield across the three seasons being very similar to other varieties. PBA Rana has better resistance to ascochyta blight, chocolate spot and rust than the other faba bean varieties. It has larger seed that is considered very good quality in the Middle East markets.
- The broad bean varieties Aquadulce and PBA Kareema yielded significantly less than the faba bean varieties in all years. Broad beans are very late to fill pods and mature, compared to faba beans, and require a long and cool pod filling period to attain maximum yields.
- A significant level of chocolate spot developed in all seasons and is likely to have affected yields. Chocolate spot is favoured by high humidity during the flowering and pod filling period and a preventative fungicide should be applied at the commencement of flowering with follow-up applications dependent on disease development and weather conditions.

**Background/Aim:**

Faba beans are the pulse crop best suited to the long season, high rainfall areas of south eastern Australia where waterlogging can be a problem. They have good early vigour, produce high biomass and have high biological N fixation. Recent advances in developing disease resistant varieties, combined with improved management packages, have reduced the risk of producing faba beans. Faba beans have been widely evaluated throughout South Australia and in the Wimmera for many years, but evaluation in the Western Districts of Victoria where they might be expected to be well adapted commenced in 2009. This trial aims to identify the current faba bean varieties that are best suited to the Western Districts, and to assist in selection of future varieties for the region.

**Trial information:**

Trial design consisted of a replicated randomised block design with 4 replications. Plots were treated with three fungicide sprays to control a high level of chocolate spot. Plots were 12 metres long and 1.45m wide. There were excellent conditions for growth and high yields were achieved.

**Rainfall:**

2011 Total:	595 mm
Avg. Annual:	540 mm
2011 G.S.R.:	347 mm
Avg. G.S.R.:	400 mm

**Paddock history:**

2009:	Barley
2010:	Wheat

**Treatments:** Four faba bean varieties, 2 broad bean varieties and 10 faba bean breeding lines.

**Sowing rate:** Faba beans 24 seeds/sq m, Broad beans 12 seeds/sq m.

**Sowing date:** 20-May-2011

**Fertilizer:** 20-May-11      MAP 100kg/ha MAP,

<b>Herbicides:</b>	19-May-11	Roundup Powermax 2L/ha Outlook 750ml/ha Treflan 1L/ha Simazine 600 SC 1.2L/ha
	21-Jul-11	Select 400ml/ha Verdict 30ml/ha Uptake 500ml/ha
	8-Sep-11	Liase 1L/ha Factor WG 80G/ha Select 240 0.5L/ha Hasten 1L/ha
<b>Fungicides:</b>	8-Sep-Bravo @ 2.3 l/ha	
<b>Plot size:</b>	12m x 1.45m x 4 reps	
<b>Measurements:</b>	Grain yield	
<b>Diseases:</b>	Chocolate spot developed during flowering and podding.	

### Results and discussion:

The average yield obtained in the faba bean trial in 2011 was 2.87 t/ha, lower than the SFS faba bean trials in 2009 and 2010 (Table 1). There was little difference in the yield of the three current major faba bean varieties in the trial in 2011, and the observed difference was not statistically significant. This is consistent with previous years where there has been little difference in yield between Fiesta, Farah and Nura. A recently released variety, PBA Rana, produced a higher yield than other varieties and was significantly greater than Nura. The results for PBA Nura have been a bit inconsistent between seasons, with comparable yields to other varieties in 2009, less in 2010 and more in 2011, with the overall average being very similar to other varieties. Two broad bean varieties, Aquadulce and PBA Kareema, were included in the trials and both yielded significantly less than the faba bean varieties in all years.

Several of the advanced breeding lines had comparable, or higher, yields than the faba bean varieties. AF05060, AF05069, AF05095 and AF06125 appear to be the most promising of the breeding lines. They will continue to be evaluated in trials in the Western Districts to ensure there is long-term data regarding their suitability to the region at the time of variety release.

Chocolate spot has been the major fungal disease in the three years that faba bean trials have been conducted in the region. Chocolate spot progresses very rapidly when conditions are conducive and can cause very significant crop damage and loss of yield. Factors that favour disease development include; high relative humidity for an extended period particularly when it coincides with increasing temperatures during spring, a bulky crop to retain humidity within the canopy and faba bean flowers are particularly susceptible to disease infection. Chocolate spot should be managed with application of appropriate fungicides commencing at canopy closure and early flowering, with follow-up applications prior to rain fronts, depending on overall seasonal conditions and presence of disease. While there is some variation in reaction of varieties to chocolate spot, all varieties are susceptible to some degree and resistance cannot be relied on alone for disease management. There has been little ascochyta blight and this might reflect a low level of endemic inoculum due to limited production of faba bean in the region, and also a generally good level of resistance to ascochyta blight among lines in the trials. PBA Rana is the most resistant of the current varieties and Nura, Farah and PBA Kareema are MR-R. Ascochyta blight should be monitored in these varieties and fungicides applied to control the disease if it is observed. However, if the more susceptible varieties Fiesta and Aquadulce are grown, fungicides should be applied to control ascochyta blight at 6-8 weeks after sowing even if disease is not apparent.

**Table 1.** Grain yield (t/ha) for faba bean and broad bean varieties and breeding lines at Dunkeld in 2009 and Lake Bolac in 2010 and 2011.

Variety	Yield (t/ha)		
	2009	2010	2011
<b>Faba bean varieties</b>			
Farah	4.14	4.62	2.70
Fiesta VF	3.94	4.61	2.65
Nura	4.01	4.83	2.55
PBA Rana	4.04	3.89	3.11
<b>Faba bean breeding lines</b>			
AF03063	4.11	4.35	2.51
AF04053			3.00
AF05060	4.42	4.89	3.32
AF05069		5.22	3.54
AF05073	4.55	4.38	3.15
AF05095	4.27	4.70	2.81
AF06125		4.60	3.22
<b>Broad bean varieties</b>			
PBA Kareema	2.18	3.63	2.14
Aquadulce	2.04	3.36	1.86
LSD (P=.05)	0.6	0.45	0.49
CV	10.5	7.4	12.0
Grand mean	3.99	4.31	2.87

In three years the trials have demonstrated that faba bean varieties can be grown successfully in the Western Districts with average yields of about 4t/ha, although the actual yields vary with seasonal conditions. As there is little difference in yield between the three varieties that are currently available, the decision about which variety to grow should take into account other factors such as overall disease resistance and quality. Farah and Nura are both MR-R to Ascochyta blight and under most circumstances suffer very little seed staining due to Ascochyta, whereas Fiesta VF is MS-MR and seed staining can be a major problem particularly if there is significant rainfall during the pod filling period. Farah and Nura have similar seed colour and size (although Farah is slightly larger than Nura) and the two varieties can be mixed for marketing. PBA Rana is a new alternative and has better overall disease resistance than Farah and Nura. Trial results throughout Southern Australia have shown it is better suited to high rainfall, long growing season environments. The seed of PBA Rana is larger than Fiesta and Farah, and also lighter and more uniform in colour and is considered a premium quality bean for the Middle East markets. The results from three season's trials indicate that faba beans have better potential than broad beans, but if broad beans are to be grown the improved disease resistance of PBA Kareema would make it a lower risk crop than Aquadulce. An extended pod filling period is required to achieve large and uniform broad beans and a dry finish to the season can result in the pods at the top of the plants producing small seeds that might have lower commercial value.

**Summary:**

Trials in 2009 - 2011 have demonstrated the potential of current faba bean varieties for production in the Western Districts, and also the promise of improved varieties in the future. Faba beans performed better than broad beans in all seasons and this can be attributed to the requirement of broad beans for an extended, cool, pod development period to produce maximum yields. Chocolate spot was the major disease in all seasons and early fungicide application, at the time of commencement of flowering, is required to delay establishment of the disease. Follow-up applications might be required depending on seasonal conditions.