

Faba Bean and Field Pea Varieties and Management - 2012 Results Westmere

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Introduction

The Southern Pulse Agronomy program undertakes a range of agronomic trials that ensures the benefits of new pulse varieties are maximised and delivered to growers. The research outlined below focuses on the impacts of sowing dates, disease management and crop topping in field peas and disease management option in faba bean.

In south western Victoria, field peas and faba beans are generally perceived to be the lowest risk pulse crops for the region. However, uptake and overall production as a proportion of the total cropped area remains relatively low compared with other cropping zones. Potential reasons for these observations are varied, but generally relate to risks associated with disease and weed management and lack of profitability compared with other cropping options.

The trials presented here investigate a range of management options across the latest varieties and potential new releases in field pea and faba bean at Westmere.

Field Peas

Aim

To investigate the adaptability of a range of field pea varieties to varying sowing dates, crop topping and disease control.

Treatments

Varieties: Kaska, PBA Oura, PBA Hayman, Morgan, PBA Pearl, OZP0805, OZP1103, OZP1101.
 Sowing dates: 9 May (Early), 6 June (Mid), 4 July (Late).
 Crop Topping: Mid: Applied at rye grass milky dough
 Disease Control Fortnightly: chlorothalonil 500 @ 2 L/ha applied fortnightly starting 6 weeks after emergence.
 Early: mancozeb @ 2kg applied 9 Node + early flower

Other Details

Stubble: Cultivated
 Row Spacing: 20 cm.
 Fertiliser: MAP @ 60 kg/ha at sowing.
 Plant Density: 35 plants/m².

Results and Interpretation

Key Message: Early sowing, concurrent with previous research, was highest yielding in 2012. There appear to be several promising new varieties available for southern Victoria, offering a range of grain types and forage options, associated with excellent yield potential. Crop topping results highlight the importance for growers and advisors to be aware of both weed and crop growth stages, otherwise significant grain yield loss could occur.

Seasonal conditions at Westmere were excellent for pulse production, with adequate rainfall and few high or low temperature events that impacted on yield. Grain yields ranged from 2.3 t/ha for PBA Hayman sown Jul 4 to 5.0t//ha for Kaska sown 9 May. A summary for each of the agronomic treatments is outlined below.

- **Disease management** – There was no impact of disease management in field peas for 2012.
- **Sowing Dates** – As there was no impact of disease management, data for sowing dates has been averaged across all disease management treatments (but excludes the crop topping treatment (Table 1)). Generally the early (9 May) and mid (6 June) sowing dates had similar yields, while the later sowing date (4 July) was 30% lower yielding (Table 1). However, there were some varietal differences to this trend. PBA Hayman showed a slight yield increase at the mid sowing date and no yield loss at the last sowing date. OZP1103 generally showed lower yield loss with delayed sowing compared with all varieties except PBA Hayman. Conversely, PBA Oura appeared to show the greatest yield loss between the early, mid and late sowing times. Comparing the overall yield of varieties, Kaska and OZP0805 were highest and PBA Hayman lowest (Table 1).
- **Crop Topping** – Yield loss from crop topping in 2012 ranged from 5% to 65% (Table 2). Generally the yield reductions were least at the latest sowing date and highest at the early sowing date. PBA Hayman showed the greatest yield loss with the crop topping treatment at all sowing dates, while there was little difference between other varieties at the early and mid sowing dates. At the latest sowing date, OZP1101 and OZP1103 appeared to show the least yield loss (Table 2).

Table 1. Effect of sowing date on grain yield (t/ha) of field pea varieties grown at Westmere in 2012. Purple shading indicates highest yield variety within that sowing date. Light purple shading indicates yield significantly different from highest yielding variety.

Variety	9 May	6 June	4 July	Mean
OZP0805	4.89	4.73	3.54	4.39
OZP0805	4.89	4.73	3.54	4.39
Kaspa	4.98	4.72	3.38	4.36
OZP1103	4.55	4.54	3.73	4.27
OZP1101	4.80	4.76	3.03	4.20
PBA Pearl	4.54	4.25	2.84	3.88
Morgan	4.50	4.06	2.94	3.84
PBA Oura	4.69	4.06	2.74	3.83
PBA Hayman	2.44	2.91	2.28	2.54
Mean	4.42	4.25	3.06	3.91

Table 2. Grain yield reduction (%) from a crop topping treatment applied to new field pea varieties sown at 3 dates at Westmere in 2012.

Variety	9 May	6 June	4 July	Mean
OZP0805	26	42	16	28
Kaspa	25	32	21	26
OZP1103	34	45	6	28
OZP1101	32	36	5	24
PBA Pearl	31	37	25	31
Morgan	31	47	22	33
PBA Oura	30	38	12	27
PBA Hayman	65	63	46	58
Mean	34	42	19	32

Key Findings and Comments

- Varieties – Kaspa and its potential replacement OZP0805, performed extremely well at Westmere in 2012, with yields in the top 3 lines across all sowing dates. The new white pea PBA Pearl also showed promise and offers different marketing opportunities. Also of note is OZP1103 which showed both excellent yields and biomass (data not shown) as this variety has potential for dual purpose (i.e. both forage and grain). Further varietal details below.
- Sowing Dates – As has been seen in previous research, early sowing produced the highest yields. Based on yields achieved of the earlier sown treatments (4.5t/ha) peas could have achieved a gross profit of approximately \$1300/ha based on management costs of \$250/ha and grain price at \$340/t. Results from 2011 at Lake Bolac show that sowing early increases grain yield. The three sowing dates used in 2011 were later than the ones used in 2012, the latest being on the 9th of August. All varieties yielded particularly badly compared to the earlier sowing dates of 20th May and the 16th of June. Kaspa, PBA Oura and PBA Hayman were the varieties grown in both 2011 and 2012, and all produced similar yield in both trials. The earliest sowing date produced the greatest yields, followed by the mid sowing date, followed by the late sowing date for both Kaspa and PBA Pura. Hayman produced its highest yield at the mid sowing date, followed by the early, followed by the late in both years.
- Crop Topping – In 2012 at Westmere, crop-topping targeting ryegrass at the milky dough stage caused significant yield loss in all varieties grown. This could be expected as the crop was too green and seed not sufficiently developed for application of a desiccant. This highlights the importance for growers and advisors to be aware of both weed and crop growth stages, otherwise significant grain yield loss could occur. Results from a similar trial in 2011 at Lake Bolac did not show any overall effect of crop topping on grain yield. This again indicates that if the crop top is applied at the correct timing, the risk of reducing grain yield is reduced.
- Disease Management – These treatments were implemented to assess the effect disease is having on grain yields of field peas in a high rainfall zone. Unlike 2011, there was no response to disease control as disease pressure was low. A fortnightly fungicide regime is unlikely to be economically viable, unless yields are above 2t/ha and differences are in excess of 20% when using a fungicide. However, the early strategy, although not economically profitable, may be a risk management strategy to minimise the chance of yield loss from disease like black spot.

Field Pea Variety Information and New Varieties for 2013

Agronomic characteristics of current field pea varieties

Variety	Plant habit	Plant vigour, Early season	Flowering time	Maturity time	Plant lodging resistance, at maturity	Pod shattering, at maturity
Yellow or Blue pea grain type						
Excell	SD-SL	High	Early-mid	Late	Good	S: NSP
PBA Hayman	Multi-branched	Very High	Very Late	Very Late	Fair-Good	MR: NSP
PBA Pearl	SD-SL	High	Early-Mid	Early	Good	MR: NSP
Sturt	C	High	Early-Mid	Mid	Poor	MR: NSP
Kaspa grain type						
Kaspa	SD-SL	High	Late	Mid	Fair-Good	R: SP
OZP0805	SD-SL	high	Early-mid	early	Fair-Good	R: SP
PBA Gunyah	SD-SL	High	Early-Mid	Early	Fair-Good	R: SP
PBA Twilight	SD-SL	High	Early	Early	Fair-Good	R: SP
Australian Dun grain type						
Morgan	Tall-SL	High	Late	Late	Poor-Fair	MR: NSP
OZP1103	C	Very High	Mid-Late	Mid	Poor	MR: NSP
Parafield	C	High	Mid	Mid	Poor	MR: NSP
PBA Oura	SD-SL	High	Early-Mid	Early	Fair-Good	MR: NSP
PBA Percy	C	High	Early	Early	Poor	MR: NSP

SD=Semi-dwarf, C=Conventional, SL= Semi-leafless, S=susceptible, MS=moderately susceptible, MR=moderately resistant, R=resistant, SP=Sugar pod type pod, NSP=Non sugar pod type.

Disease resistance characteristics of current field pea varieties

Variety	Blackspot (Ascochyta)	Bacterial blight (Field rating)	Downy mildew (Kaspa strain)	Downy mildew (Parafield strain)	Powdery mildew	PSbMV virus	BLRV virus (Field rating)
Yellow pea grain type							
PBA Hayman	MS	MR*	S*	MS*	R	*	*
PBA Pearl	MS	MS	MR-MS	R	S	S	R
Sturt	MS	MS	S	MS	S	S	MR-MS*
Kaspa grain type							
Kaspa	MS	S	S	MR	S	S	S
OZP0805	MS	S	S	S	R	R	R
PBA Gunyah	MS	S	S	R	S	S	S
PBA Twilight	MS	S	S	R	S	S	S
Australian Dun grain type							
Morgan	MS	MS	S	MR	S	S	S*
OZP1103	MS	MS*	S*	S*	*	R	*
Parafield	MS	MS	S	S	S	S	S
PBA Oura	MS	MR-MS	MR-MS	MR-R	S	S	MR-MS*
PBA Percy	MS	MR	S	S	S	S	S

S=susceptible, MS=moderately susceptible, MR=moderately resistant, R=resistance. PSbMV = Pea seed borne mosaic virus. BLRV = Bean leaf roll virus. *Requires validation.

PBA Pearl

PBA Pearl is a semi-leafless white pea variety which is broadly adapted and has had high yields in evaluation trials in all districts. It has good early vigour and an erect growth habit, with excellent standability at maturity. It is early to mid flowering, and produces non sugar-type pods but is not prone to shattering (similar to PBA Aura and Parafield). It has a favourable disease resistance profile, with good tolerance to bacterial blight and good resistance to downy mildew and Bean Leaf Roll virus.

PBA Hayman

PBA Hayman is a late flowering and late maturing conventional pea suitable for forage production as an alternative to vetch. It produces small white seed, and has lower seed yield than Morgan (which is generally considered a dual purpose variety) but has higher biomass production. PBA Hayman also has improved resistance to powdery mildew over Morgan. Seed is expected to be available from Seednet for 2013 sowings.

Two advanced field pea lines are currently under multiplication for potential release in 2013. OZP0805 is an early-mid flowering and maturing 'Kaspa type' (ie round seeded) dun field pea offering improved powdery mildew and virus resistances (Bean Leaf Roll and Pea Seed Borne Mosaic viruses). It provides the same agronomic benefits as Kaspa (eg lodging and shattering resistance) and will provide a reliable alternative in areas where powdery mildew and viruses are regular problems. OZP1103 is a conventional dun field pea offering a forage option with high early season dry matter production and high yield potential in long seasons. OZP1103 has improved bacterial blight resistance, is resistant to powdery mildew and shows improved boron and salt tolerance. These lines are currently under multiplication in SA and are expected to be available through Seednet for 2014 sowings.

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Faba Beans

Aim

To investigate the effect of chocolate spot and rust management strategies across a range of faba bean varieties.

Experimental Treatments

Varieties: AF050069, AF05095, AF06125, AF07125, Farah, Nura, PBA Rana.

Fungicide Regimes:

Treatment	Chemical and Application Rate ¹	Timing
Nil	Nil	Nil
Double Choc (Cx2)	carbendazim 500 @ 500ml/ha	Early and late flower
Triple Choc (Cx3)	carbendazim 500 @ 500ml/ha	Early, mid and late flower
Complete (Com)	mancozeb 800 @ 2kg/ha chlorothalonil 720 @ 2L/ha carbendazim 500ml/ha	mancozeb + chlorothalonil applied fortnightly from 6-8 weeks after emergence All 3 chemical applied fortnightly during flowering.
Rust (Rx2)	Tebuconazole 430 @ 350ml/ha	6-8 weeks after emergence and early flower
Rust (Rx3)	Tebuconazole 430 @ 350ml/ha	Early, mid and late flower

¹ Refers to application rate of the product

Other Details

Sowing date: 2 May.
Stubble: Cultivated
Row Spacing: 20 cm.
Fertiliser: MAP @ 60 kg/ha at sowing.
Plant Density: 20 plants/m².

Results and Interpretation

Key Message: New varieties are likely to offer significant yield improvement in southern Victoria, along with improvements in disease resistance.

- **Disease Damage** – Due to a relatively dry winter and spring, disease pressure was only low to moderate in the faba beans. Chocolate spot and cercospora were first noted in August, but disease development was slow. Chocolate spot was the predominant disease, while no rust was seen in the trials. There was a significant interaction between the fungicide regime and variety (Figure 1). For all varieties there was minimal disease in the 'complete' treatment, while the Nil treatment resulted in significant infection with scores ranging between 4.5 and 5.5. AF05073, AF07125, Farah and PBA Rana showed significantly worse symptoms than all other

varieties. The chocolate spot and rust control strategies reduced disease scores similarly in all varieties and the relative trend among varieties within a regime remained similar to the Nil treatment.

- **Grain Yield** – Unlike the 2011 trials in Lake Bolac, none of the disease management regimes translated into any significant effect on grain yield, so only the mean grain yield across all treatments has been presented (Table 1). Grain yields were excellent ranging from 4.0t/ha to 5.5 t/ha. AF05095 was the highest yielding variety (5.53t/ha), 37% higher than Farah and 33% higher than Nura which were lowest yielding varieties this year.

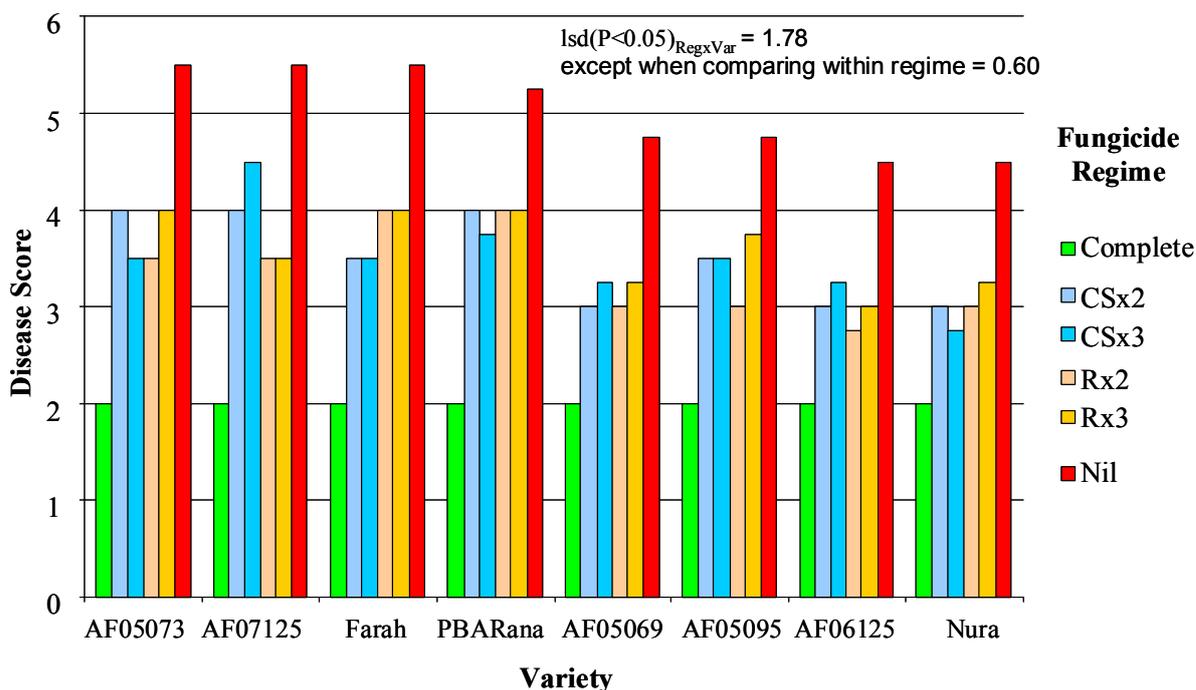


Figure 1. The interaction effect of fungicide regime and variety on disease damage score (1 – no symptoms present, 9 – complete plot death) of faba beans at Westmere recorded November 8, 2012. Disease damage was a combination of Chocolate Spot and Cercospora; Rust was the predominant disease present.

Table 1. Grain yield of faba bean varieties grown at Westmere in 2012.

Variety	Grain Yield (t/ha)	
AF05095	5.53	a
AF05069	5.14	b
AF05073	5.00	b
AF07125	4.49	c
PBA Rana	4.49	c
AF06125	4.49	c
Nura	4.14	d
Farah	4.04	d

LsdP<0.05 = 0.37. Means folled by the same letter do not differ significantly from one another.

Key Findings and Comments

Growing conditions in 2012 were excellent for faba beans, due to adequate growing season rainfall and mild temperatures during flowering and podding periods with few frosts or high temperatures. In addition, the disease intensity was relatively low, so yield potential was high. While there were clear varietal differences in susceptibility to disease and level of disease within fungicide treatments, it had no impact on grain yield. This probably occurred because spring conditions were relatively dry and not conducive to an increase in disease intensity, which often occurs in wetter spring conditions.

Grain yield of the beans was excellent and the potential new varieties all had yields significantly higher than Farah, with AF05095, 37% greater than Farah. Longterm data across a range of environments from the breeding program indicates that AF05095, AF05069 and AF05073 have yields approximately 10% greater than Farah. Similar to observations in this trial, AF05095 and AF05069 also have improvements in disease resistance. AF05095 along with other new varieties assessed in this trial are likely to offer significant yield improvements in southern Victoria, along with improvements in disease resistance

Based on yields achieved (5t/ha) beans could have achieved a gross profit of approximately \$1900/ha based on management costs of \$300/ha and grain price at \$440/t.

Faba Bean Variety Information and New Varieties for 2013

Faba bean variety agronomic and disease guide.

Variety	Seed size	Seed colour	Flowering time	Maturity	Ascochyta blight Foliage	Ascochyta blight Seed	Chocolate spot	Rust
Aquadulce	large	light brown	late	late	MS	MS	MS	MS
PBA Kareema	large	light brown	late	late	RMR	RMR	MRMS	MR
Farah	medium	light brown	early-mid	early-mid	RMR	RMR	S	S
Fiesta VF	medium	light brown	early-mid	early-mid	MRMS	MS	S	S
Nura	small-med	light brown	mid	early-mid	RMR	RMR	MS	MR
PBA Rana	med-large	light brown	mid	mid	R	R	MRMS	MS

Disease ratings from Pulse Breeding Australia.

R = Resistant RMR = Resistant to moderately resistant MR = Moderately resistant MRMS = Moderately resistant to moderately susceptible MS = Moderately susceptible MSS = Moderately susceptible to susceptible S = Susceptible SVS = Susceptible to very susceptible VS = Very susceptible

There are no newly released varieties for 2013. PBA Rana is the most recent release, which was grown commercially for the first time in 2012.

PBA Rana

PBA Rana (tested as AF10060/15-1 or 974*(611*974)/15-1) is a vigorous plant with good stem strength, mid to late flowering (similar to Nura) and mid maturity (later than Farah and Nura). It is well adapted to high rainfall, long growing seasons. Highest yields have been achieved in the Lower South East, Central Hills/ Fleurieu Peninsula and the high rainfall sites in the lower and mid-North where long term yields are equal to or greater than Fiesta VF and Farah. PBA Rana has good resistance to ascochyta blight and is moderately susceptible to chocolate spot. It has shown very useful field resistance (MS-MR) to rust, better than other commercial varieties. PBA Rana produces large, plump and light brown seed suited to Egyptian market requirements for that grade. It represents a unique and different category for faba bean marketing. PBA Rana is licensed to Viterra and an end point royalty applies.



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