

Field pea varieties and disease management

Jason Brand¹

¹ DEPI Horsham, Victoria

Take home messages

- New varieties of field peas are available for southern Victoria, offering a range of grain types and forage options, associated with excellent yield potential.
- Kaspa continues to perform well with new line OZP1101 consistently producing the highest yields.
- Crop topping saw a yield reduction in most varieties due to crops not being advanced enough when ryegrass was at milky dough stage.
- In 2013, a fortnightly fungicide program proved profitable to control disease in field peas (particularly black spot).
- Sowing earlier has been found to be most profitable in this region, but disease management needs to be a priority.
- Based on yields achieved where disease was managed (4.7 t/ha) peas could have achieved a net profit of approximately \$1000/ha based on management costs of \$370/ha and grain price at \$300/t.

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. 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.

Similar to 2012, the trials presented here investigate a range of management options across the latest varieties and potential new releases in field pea.

Treatments

Table 1. Agronomic and management details

Varieties:	Kaspa, PBA Hayman, Morgan, PBA Pearl, PBA Wharton, PBA Coogee, OZP1101 and OZP1202. Due to mixed seed PBA Wharton was excluded from trial analysis.
Sowing dates:	7 May (Early), 5 June (Mid), 2 July (Late).
Crop Topping:	Mid: target the optimal stage of the earliest maturing peas for desiccation as application at rye grass milky dough would have resulted in severe yield loss for all varieties.
Disease Control	Fortnightly: chlorothalonil 500 @ 2 L/ha plus mancozeb @ 2kg applied fortnightly starting 6 weeks after emergence. A total of 6 applications were made throughout the season.
	Early: mancozeb @ 2 kg applied 9 Node + early flower.
Other Details	
Stubble:	Incorporated
Row Spacing:	20 cm
Fertiliser:	MAP @ 60 kg/ha at sowing
Plant Density:	35 plants/m ²

Results and Interpretation

New varieties are available for southern Victoria, offering a range of grain types and forage options, associated with excellent yield potential. Disease management was economically viable in 2013. Based on yields achieved where disease was managed (4.7 t/ha) peas could have achieved a net profit of approximately \$1000/ha based on management costs of \$370/ha and grain price at \$300/t.

Following a relatively dry start to the season, conditions at Westmere were generally good for pulse production, with adequate rainfall and few high or low temperature events that impacted on yield. Grain yields ranged from 1.4 t/ha for PBA Hayman sown July 2 and May 7 to 6.1 t/ha for PBA Coogee sown May 7 with fortnightly fungicide applications (Table 2). A summary for each of the agronomic treatments is outlined below.

Table 2. Effect of sowing date and disease management strategy on grain yield (t/ha) of field pea varieties grown at Westmere in 2013.

Sowing Time	Disease Management	Kaspa	Morgan	OZP1101	PBA Coogee	OZP1202	PBA Hayman	PBA Pearl	Average
7 May	Nil	4.09	4.01	4.07	4.43	3.63	1.48	4.27	3.71
	Early	3.91	3.99	3.93	3.42	3.82	1.63	4.51	3.60
	Fortnight	5.57	5.27	4.57	6.06	5.03	2.41	4.41	4.76
	Average	4.52	4.42	4.19	4.64	4.16	1.84	4.39	4.02
5 June	Nil	4.92	3.73	4.98	3.96	4.13	1.57	4.67	3.99
	Early	4.53	4.01	4.67	4.03	3.86	1.79	4.85	3.96
	Fortnight	5.43	4.81	5.36	5.58	5.22	1.99	4.85	4.75
	Average	4.96	4.18	5.00	4.52	4.40	1.78	4.79	4.23
2 July	Nil	4.34	3.30	4.62	3.70	3.90	1.49	4.49	3.69
	Early	4.20	2.96	4.86	3.41	3.54	1.36	4.52	3.55
	Fortnight	5.11	4.28	5.22	4.77	4.79	1.43	4.77	4.34
	Average	4.55	3.51	4.90	3.96	4.08	1.43	4.59	3.86

LSD(P<0.05)sow date x disease management x variety = ns

LSD(P<0.05)sow date x variety = 0.51 except when comparing within a sowing date = 0.34

LSD(P<0.05)disease management x variety = 0.37 except when comparing within a disease management category = 0.34.

Variety evaluation

Kaspa continued to perform extremely well at Westmere in 2013, consistently being among the top yielding varieties at all sowing dates. The new breeding line OZP1101 produced consistently highest yields. The new white pea PBA Pearl also showed promise and tolerated disease (despite showing significant symptoms) and being least responsive to the fortnightly fungicide application. It also offers alternative marketing opportunities.

PBA Coogee showed excellent yield when sown at the earlier sowing dates, but also appeared to be one of the most sensitive varieties to the disease that was present. Further varietal details are in the following tables. Based on yields achieved where disease was managed (4.7 t/ha) peas could have achieved a net profit of approximately \$1000/ha based on management costs of \$370/ha and grain price at \$300/t.

Sowing Dates

Unlike previous seasons of 2011 and 2012, there was no major effect of sowing date on grain yield; ie. Early sowing produced similar yields to the later sowing dates. However, disease symptoms were significantly worse in early sown plots and a greater response to fortnightly fungicide application was observed. Previous seasons have shown 'early' sowing to be the most profitable option in this region.

Disease management and economics

Unlike 2012, there was a significant impact of disease (primarily 'black spot') on the growth and yield of field peas at Westmere in 2013. Plots sown 'early' (May 7), showed significantly worse disease symptoms than those sown 'mid' (June 5), which were worse than the 'late' plots (July 2) (Table 4). At the 'early' sowing date PBA Hayman showed the least symptoms, while Kaspa, PBA Pearl and OZP1101 were worst. A similar trend was observed at the 'mid' sowing date, however differences were not as significant. At the late sowing date there was little difference between varieties, however PBA Hayman, still appeared to show least symptoms (Table 3). There was also a significant impact on grain yields with reductions of up to 39%, where no fungicide had been applied in comparison to the fortnightly spray regime (Table 2 and 4). The 'early' fungicide was similar to the 'nil' treatment throughout the trial.

At the 'early' sowing date PBA Hayman, despite showing the least disease symptoms, had the greatest decrease in yield between the 'fortnightly' and 'nil' fungicide treatments. PBA Pearl, despite showing some of the most severe disease symptoms showed almost no response to the 'fortnightly' fungicide application in comparison to the 'nil'. At the 'mid' sowing date PBA Coogee showed the greatest yield loss in the 'nil' treatment, while PBA Pearl was again least. At the latest sowing date PBA Pearl and PBA Hayman showed very little difference between the 'nil' and 'fortnightly' treatments, while Morgan and PBA Coogee showed the greatest differences (Table 2 and 4).

Table 3. Effect of sowing date disease management on disease score (0 – No Disease; 100-Plant death), primarily black spot, recorded November 1, of field pea varieties grown at Westmere in 2013.

Sowing Time	Disease Management	Kaspa	Morgan	OZP1101	PBA Coogee	OZP1202	PBA Hayman	PBA Pearl	Average
7 May	Nil	43	33	56	35	39	21	50	39
	Early	53	41	44	41	40	28	50	42
	Fortnight	28	26	24	29	30	19	33	27
Average		41	33	41	35	36	23	44	36
5 June	Nil	21	20	19	23	21	16	19	20
	Early	16	21	14	20	18	10	19	17
	Fortnight	11	8	11	11	8	6	10	9
Average		16	16	15	18	15	11	16	15
2 July	Nil	8	6	8	9	6	5	9	7
	Early	9	8	5	8	6	5	8	7
	Fortnight	5	4	4	5	5	4	5	4
Average		7	6	5	7	6	5	7	6

LSD(P<0.05)sow date x disease management x variety = 8

Table 4. Relative grain yield (%) of the 'Nil' fungicide treatment compared with the 'Fortnightly' fungicide treatments applied to new field pea varieties sown at 3 dates at Westmere in 2013.

Sowing Time	Kaspa	Morgan	OZP1101	PBA Coogee	OZP1202	PBA Hayman	PBA Pearl	Average
7 May	-26	-24	-11	-27	-28	-39	-3	-23
5 June	-9	-22	-7	-29	-21	-21	-4	-16
2 July	-15	-23	-12	-22	-19	4	-6	-13
Average	-17	-23	-10	-26	-23	-19	-4	-17

Previously it has been suggested that a fortnightly fungicide strategy would not be economically viable, however data from 2013 suggests that in a high yielding environment, when black spot is at significant levels, disease management could significantly reduce risk and improve returns to growers. In a high disease pressure situation, it is unlikely that the early fungicide strategy would provide any significant benefit.

Economically the fortnightly treatment would have proved profitable in 2013 at all sowing dates, compared with the 'nil', despite increased costs associated with the 6 applications (Table 5). Generally the early sowing date had the greatest relative economic improvement and the late sowing date the least.

Table 5. Relative economic (\$/ha) benefit of using a 'Fortnightly' fungicide regime in comparison to 'Nil' fungicide on new field pea varieties sown at 3 dates at Westmere in 2013.

Sowing Time	Kaspa	Morgan	OZP1101	PBA Coogee	OZP1202	PBA Hayman	PBA Pearl	Average
7 May	\$445	\$379	\$154	\$502	\$408	\$203	\$48	\$306
5 June	\$137	\$291	\$101	\$437	\$297	\$113	\$48	\$203
2 July	\$209	\$266	\$163	\$287	\$242	-\$15	\$73	\$175
Average	\$263	\$312	\$139	\$409	\$316	\$100	\$57	\$228

Field pea price = \$300/t; Production costs = \$250 + \$20/ha per fungicide application (6 applications used for the fortnightly regime).

Crop Topping

In 2013 at Westmere, crop-topping was delayed because significant yield loss in all varieties would have occurred similar to 2012 if it was applied to ryegrass at the milky dough stage as all varieties were not mature enough. Despite the delay to target the optimal stage of the earliest maturing peas for desiccation, a significant yield loss was seen for many varieties. Yield loss from crop topping in 2013 ranged from 1% to 14% (Table 6). There were no major differences between sowing dates. PBA Hayman showed the greatest yield loss with the crop topping treatment, similar to 2012 dates, while OZP1101 and Kaspa, showed almost no yield loss (Table 2). This is most likely due to the late maturity of PBA Hayman. These trials have highlighted that crop-topping may not be a viable option to manage ryegrass in the high rainfall zone of Victoria.

Table 6. Mean effect of crop topping on the grain yield (t/ha) of new field pea varieties sown at Westmere in 2013.

Sowing Time	Kaspa	Morgan	OZP1101	PBA Coogee	OZP1202	PBA Hayman	PBA Pearl	Average
Nil	4.44	3.64	4.57	3.98	3.82	1.46	4.47	3.77
Crop top	4.28	3.40	4.54	3.80	3.57	1.25	4.11	3.56
% Yield Loss	-3	-7	-1	-5	-7	-14	-8	-5

LSD(P<0.05)crop top = 0.20.

Field Pea Variety and Agronomic Guide - New varieties for 2014

PBA Wharton (OZP0805) is a new high yielding “Kaspa type” field pea. PBA Wharton combines disease resistance to the viruses PSbMV and BLRV and powdery mildew with the same agronomic benefits as Kaspa (eg lodging and shattering resistance). PBA Wharton is early to mid season flowering and early maturing (e.g. similar PBA Gunyah). It is widely adapted across southern cropping regions of Australia and best suited to districts with a short to medium growing season or those that are prone to powdery mildew and virus diseases (e.g. south east SA). Its grain colour and size is similar to Kaspa but more spherical and smoother. PBA Wharton can be marketed as “Kaspa type” grain. Seed is available through SeedNet.

PBA Coogee (OZP1103) is a high yielding conventional (trailing) type dun pea that provides the flexibility of a forage option if frost or drought limit grain yield potential. PBA Coogee has a conventional plant type similar to the variety Parafield but with increased early season growth, more basal branching, longer vines and higher yield. It is a long season variety that flowers mid to late season but pods rapidly and combines resistance to powdery mildew with high tolerance to soil boron and salinity. This variety has moderate resistance to bacterial blight. PBA Coogee produces grain that can be marketed as “Australian dun type”. Seed is available through SeedNet.

Refer to Appendix C for full field pea variety and agronomic guide.