

Field Peas

F1 Ascochyta Blight (synonym: Blackspot) Management, LRZ Southern Mallee (Curyo), Victoria

F2 Ascochyta Blight (synonym: Blackspot) Management, LRZ Central Mallee (Ouyen), Victoria

F3 Ascochyta Blight (synonym: Blackspot) Management, MRZ Wimmera (Rupanyup), Victoria

F4 Ascochyta Blight (synonym: Blackspot) Management, HRZ South West (Rokewood), Victoria

Aim

To improve the success of early sown field pea varieties through identifying foliar fungicides strategies with higher levels of efficacy than the current foliar fungicide of mancozeb on Blackspot.

Treatments

Varieties: Kaspa, PBA Coogee, PBA Oura, PBA Pearl

Disease Management:

Fungicide	Application Rate (gai/ha)	Timing
Nil		
Mancozeb	1500	8 Node & flowering
Prothioconazole + Bixafen	90 + 45	8 node & flowering
Chlorothalonil	1440	Fortnightly from 6 node ¹

P-Pickel T[®] fungicide seed treatment was applied to all treatments except the 'Nil' at 200ml/100kg seed (360 g/L Thiram and 200 g/L Thiabendazole)

1. A total of 7 applications were used at Curyo, Rupanyup and Rokewood and 5 applications at Ouyen.

*****Some of the pesticide treatments in this research contain unregistered fungicides, application rates and timings and were undertaken for experimental purposes only. The results within this document do not constitute a recommendation for that particular use by the author or author's organisation.***

Other Details

	Trial Site			
	Curyo	Ouyen	Rupanyup	Rokewood
Sowing Date	4 May	5 May	15 May	26 April
Stubble (height cm)	Standing(15)	Standing (10)	Standing(30)	Standing (20)
Row Spacing (cm)	36	30	36	36
Plant Density (plant/m ²)	40	40	40	40
Fertiliser (kg/ha) ¹	60	60	80	100

1. MAP (9.2, 20.2, 0, 2.7) + Zn (2.5)

Results and Interpretation

- Key Message: Application of fungicide profitably increased grain yield in some field pea varieties. A new fungicide product, similar to previous seasons is showing significant reductions in disease and concurrent increase in yield compared with the more traditional industry strategy using mancozeb. Similar to other field pea trials, P-Pickel T[®] reduced early growth of field peas.
- Plant growth and Early vigour: Early growth and vigour of field peas at all trial sites was variable dependant on variety and fungicide treatment (Table 1). When P-Pickel T[®] was applied to seed, vigour was reduced for all varieties at both Curyo and Rupanyup, except, PBA Coogee at Curyo. Generally, Kaspa was worst affected, followed by PBA Pearl and PBA Oura, while PBA Coogee was only affected at Rupanyup (Table 1). The 'Nil' treatments had generally grown 2-4 nodes more than the PPT treatment throughout the season and overall growth did not visually catch up until October.
- Black spot Symptoms: All sites showed similar trends in response across varieties and fungicide treatments, so data was combined for analysis. With the combined data there was statistically

significant interaction between fungicide treatments and varieties (Table 2). Across all varieties the application of fungicide significantly reduced disease. Chlorothalonil applied fortnightly (generally 7-8 applications) resulted in the lowest disease scores, significantly lower than the 'Prothioconazole + Bixafen' treatment applied at 8 node and flowering, which was significantly better than a traditional industry standard of 'mancozeb' applied at 8 node and flowering. Comparing varieties, when no fungicide was applied PBA Oura had the lowest level of disease and PBA Coogee highest, however, with fungicides Kasper generally had the lowest scores, while PBA Coogee was still highest (Table 2). The scores in Kasper need to be treated with caution though, due to the PPT phytotoxicity previously described, which significantly reduced vigour and growth, particularly in Kasper. The reduced vigour, results in a more open canopy, less conducive for disease. In these trials, it was also noted that the 'Prothioconazole + Bixafen' treatment caused a slight, non-yield limiting, plant phytotoxicity response (necrosis), that needs further investigation.

- **Grain Yield and Grain Weight:** The combined analysis of variance across all sites showed that the fungicide treatments had a significant influence on the grain yield of field peas (Table 3). Similarly, there was variation in grain yield among the varieties but the effect of the interaction between fungicides and varieties was insignificant. Across all varieties, Chlorothalonil applied fortnightly resulted in the highest yield (3.22 t/ha), approximately 10-12% greater than the 'mancozeb' and 'nil' treatments, respectively, but not significantly different from the 'Prothioconazole + Bixafen' fungicide treatment. An individual analysis for each variety across all sites was also conducted and showed significant responses for PBA Coogee and PBA Oura only. For Kasper and PBA Pearl, it is likely that the PPT phytotoxicity created significant variability in the data. Focussing on the variety that displayed the least phytotoxicity, PBA Coogee, it was observed that 'mancozeb', 'Prothioconazole + Bixafen' and 'chlorothalonil' resulted in yield increases of 8%, 17% and 28%, respectively (Table 3). The results for the 'Prothioconazole + Bixafen' fungicide treatment are consistent with results observed in South Australia over this and previous seasons, and may offer growers and an opportunity significantly improve yields and profitability in field pea.

There was significant variation in grain weight among the varieties (Table 4). However, the effect of the fungicide treatments and the interaction between fungicides and varieties was not significant. PBA Oura had the highest grain weight of 21.32g followed by PBA Pearl (20.40g), which had similar grain weight to PBA Coogee. The grain weight of Kasper was the same as PBA Coogee and about 3 and 8% smaller than PBA Pearl and Oura, respectively (Table 4).

- **Gross Margins:** Similar to grain yield, for gross margins we have focussed on the results relating to PBA Coogee. Across the fungicide treatments it was estimated that the gross margins increased across all fungicide treatments, from \$566/ha in the 'nil' to \$604, \$645 and \$691, respectively, in the 'mancozeb', 'Prothioconazole + Bixafen' and chlorothalonil treatments. *Gross margins based on grain prices at \$325/t management costs of \$290/ha plus the fungicide costs (mancozeb - \$30/ha, 'Prothioconazole + Bixafen' - \$60/ha, chlorothalonil - \$105/ha).*

Table 1. Early Vigor scores (1- poor; 9 – excellent) of field pea varieties in disease management trials at A. Curyo (recorded June 15) and B. Rupanyup (recorded June 21) in 2016.

A.

Fungicide	Rate	Timing	Kasper	PBA Coogee	PBA Oura	PBA Pearl	Average
Nil			6.7	7.7	7.0	8.0	7.3
Mancozeb	1500	8 Node & flowering	2.3	6.7	5.0	4.3	4.6
Prothioconazole + Bixafen	90 + 45	8 node & flowering	2.0	7.3	4.7	3.3	4.3
Chlorothalonil	1440	Fortnightly from 6 node ¹	2.0	7.3	4.7	4.3	4.6
Average			3.3	7.3	5.3	5.0	5.2

Lsd ($P < 0.05$)_{fungicide x variety} = 0.9; _{fungicide} = 0.5; _{variety} = 0.5. CV (%) = 9.6

1. A total of 7 applications were used.

B.

Fungicide	Rate	Timing	Kasper	PBA Coogee	PBA Oura	PBA Pearl	Average
Nil			6.3	8.0	6.7	6.3	6.8

Mancozeb	1500	8 Node & flowering	2.0	5.0	3.0	2.3	3.1
Prothioconazole + Bixafen	90 + 45	8 node & flowering	2.0	5.0	3.0	2.7	3.2
Chlorothalonil	1440	Fortnightly from 6 node¹	2.0	4.7	3.0	2.3	3.0
<i>Average</i>			<i>3.1</i>	<i>5.7</i>	<i>3.9</i>	<i>3.4</i>	<i>4.0</i>

Lsd($P<0.05$)_{fungicidexvariety} = ns; fungicide = 0.3; variety = 0.3. CV (%) = 8.5

1. A total of 7 applications were used.

Table 2. Black spot disease scores (0=no symptoms; 100=complete infestation) of field pea varieties averaged across all sites (Curyo, Ouyen, Rupanyup and Rokewood) grown in disease management in 2016.

Fungicide	Rate	Timing	Kaspa	PBA Coogee	PBA Oura	PBA Pearl	<i>Average</i>
Nil			57	63	50	57	57
Mancozeb	1500	8 Node & flowering	20	32	29	27	27
Prothioconazole + Bixafen	90 + 45	8 node & flowering	14	22	20	19	19
Chlorothalonil	1440	Fortnightly from 6 node¹	8	21	10	9	12
<i>Average</i>			<i>25</i>	<i>34</i>	<i>27</i>	<i>28</i>	<i>29</i>
Lsd(Var Only, $P<0.05$)			7	7	7	8	4

Lsd($P<0.05$)_{fungicidexvariety} = 7; fungicide = 4; variety = 4. CV (%) = 30

1. A total of 7 applications were used at Curyo, Rupanyup and Rokewood and 5 applications at Ouyen.

Table 3. Grain yield (t/ha) of field pea varieties averaged across all sites (Curyo, Ouyen, Rupanyup and Rokewood) grown in disease management in 2016.

Fungicide	Rate	Timing	Kaspa	PBA Coogee	PBA Oura	PBA Pearl	<i>Average</i>
Nil			2.89	2.51	2.97	2.94	2.83
Mancozeb	1500	8 Node & flowering	2.59	2.72	3.13	3.11	2.89
Prothioconazole + Bixafen	90 + 45	8 node & flowering	2.69	2.94	3.21	3.43	3.07
Chlorothalonil	1440	Fortnightly from 6 node¹	3.05	3.22	3.54	3.08	3.22
<i>Average</i>			<i>2.81</i>	<i>2.85</i>	<i>3.21</i>	<i>3.14</i>	<i>3.00</i>
Lsd(Var Only, $P<0.05$)			ns	0.39	0.38	ns	0.24

Lsd($P<0.05$)_{fungicidexvariety} = ns; fungicide = 0.22; variety = 0.22. CV (%) = 18

1. A total of 7 applications were used at Curyo, Rupanyup and Rokewood and 5 applications at Ouyen.

Table 4. Grain weight (g/100 seed) of field pea varieties averaged across all sites (Curyo, Ouyen, Rupanyup and Rokewood) grown in disease management in 2016.

Fungicide	Rate	Timing	Kaspa	PBA Coogee	PBA Oura	PBA Pearl
Nil			20.06	19.79	21.12	20.56
Mancozeb	1500	8 Node & flowering	19.52	19.87	21.18	20.04
Prothioconazole + Bixafen	90 + 45	8 node & flowering	19.48	19.85	21.06	20.37
Chlorothalonil	1440	Fortnightly from 6 node¹	20.29	20.00	21.90	20.64
<i>Average</i>			<i>19.84</i>	<i>19.88</i>	<i>21.32</i>	<i>20.40</i>

Lsd($P<0.05$)_{fungicidexvariety} = ns; fungicide = ns; variety = 0.56. CV (%) = 6.8

1. A total of 7 applications were used at Curyo, Rupanyup and Rokewood and 5 applications at Ouyen.