

Trial 3. Disease Management Strategies for Chickpeas Grown Under Irrigation

Project objective: To assess the relative importance of fungicide input for Genesis 090 and PBA Monarch under overhead irrigation.

Location: Finley IRC

FAR Code: FAR CP21-07-1

Sown: 29 April

Cultivar: Genesis 090 and PBA Monarch

Harvested: 10th January 2022

Rotation position: Wheat (2020), Wheat (2019), Faba beans (2018)

Soil Management: Cultivation with speed disc to incorporate stubble in Autumn

Irrigation: Surface irrigation, 2 applications totally 210mm

GSR: April-November 300 mm. Total Water Available 510mm

Key Messages:

- *Monarch was more responsive to fungicide strategies than Genesis 090 and gave significant yield increases of 0.42 t/ha (cheaper programme) and 1.72 t/ha (more expensive programme) which represented a 168 & 508% increase in yield over the untreated.*
- *Disease levels, principally Ascochyta (Ascochyta rabiei) at pre flower (V19) were low (<1% leaf area infected LAI) but increased later in the season with nearly 70% crop canopy infection in late October.*
- *The fungicide strategy based on more expensive chemistry containing SDHI (group 7) and QoI (Group 11) chemistry gave significantly better disease control and significantly higher yields than strategies based on chlorothalonil but only with PBA Monarch.*
- *Genesis 090 gave a yield increase to the more expensive strategy but the advantage over the cheaper chlorothalonil programme was not statistically significant.*
- *Both fungicide strategies gave significant improvements in control of ascochyta at 13 days after the final application compared to nil control treatment and produced significant improvements in grain yield.*

Table 1. Fungicide treatment list.

Strategy	Treatment mL/ha		
	4-6 Node – 8-Jul	Pre-Flower – 27-Aug	Mid-Flower – 26-Oct
1. Untreated	-	-	-
2. Cheap	Chlorothalonil 720 @ 1.4 L/ha	Chlorothalonil 720 @ 1.4 L/ha	Chlorothalonil 720 @ 1.4 L/ha
3. Expensive	Veritas @ 1 L/ha	Aviator Xpro @ 600mL/ha	Veritas @ 1 L/ha

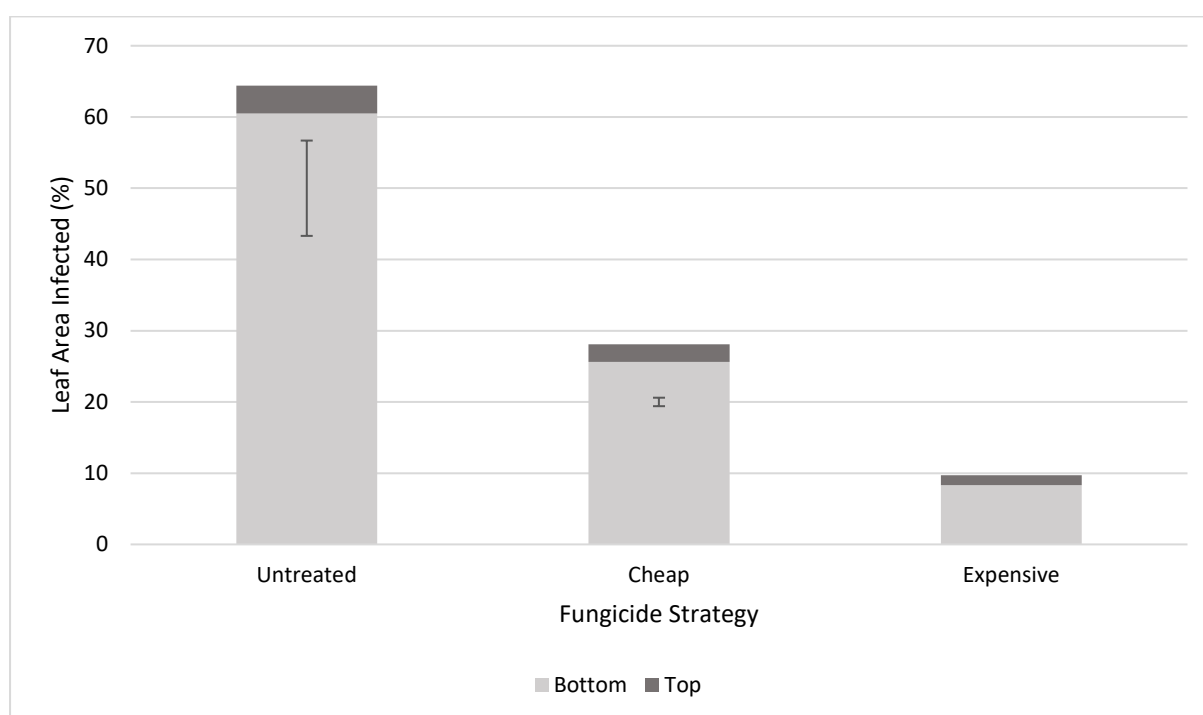
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Table 2. Influence of fungicide strategy (based on three foliar sprays) on chickpea grain yield with 2 varieties.

Treatment	Grain Yield			
	Genesis 090	PBA Monarch	Mean	
	Yield t/ha	Yield t/ha	Yield t/ha	
1. Untreated	0.89 b	0.25 c	0.57	
2. Cheap	1.77 a	0.67 b	1.22	
3. Expensive	2.09 a	1.97 a	2.03	
Mean	1.58	0.96		
Cultivar	LSD p=0.05	ns	P val	0.067
Fungicide	LSD p=0.05	0.29	P val	<0.001
Fungicide x Cultivar	LSD p=0.05	0.41	P val	0.010

**Figure 1.** Influence of fungicide strategy on Ascochyta Blight (*Ascochyta rabiei*) infection 13 days after 3rd fungicide application. Error bars represent LSD at p=0.05. Bottom crop layer (left) p<0.001, Top crop layer (right) p=0.002.**SAGI statistical analysis (Predicted values for Yield)**

The following statistical analysis of key harvest assessments has been carried out by SAGI. This analysis uses spatial statistical analysis to refine predicted values for key assessment values.

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Table 1: Harvest Traits for the Treatments

Cultivar	DiseaseManagement	Grain Yield (t/ha)
Genisis090	Cheap	1.75 ± 0.24 - b
PBAMonarch	Cheap	0.69 ± 0.24 - a
Genisis090	Expensive	2.09 ± 0.24 - b
PBAMonarch	Expensive	1.96 ± 0.24 - b
Genisis090	Untreated	0.98 ± 0.25 - a
PBAMonarch	Untreated	0.26 ± 0.24 - a

Note: values expressed as mean ± standard error of prediction
 - no subscripts relevant for this response

A summary of the experiment statistics is below:

Table 2: Key statistics for each response analysed

Statistic	Grain Yield (t/ha)
LSD	0.50
Mean	1.30
Cultivar_p-value	0.06
DiseaseManagement_p-value	0.00
Interaction_p-value	0.01
CV	65.40

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