

Foliar disease control in Beans

The aim of this replicated trial was to investigate the effectiveness of applying a range of fungicides, both with and without stickers, at two different application times on two varieties of beans - Fiesta VF and Aquadulce.

Summary

Fungicides are an effective management tool in protecting faba bean crops from grain yield and quality losses caused seasonally by Chocolate Spot and Ascochyta blight.

Owing to the late break in the season crop growth rates were low until late September and the canopy remained open minimising the risk of a severe disease infestation. Fungicide treatments did not significantly affect yield (average yield 2.6 t/ha) or grain quality at this site.

Seasonal conditions and disease pressures must always be taken into account when making a fungicide decision

Background

In addition to cultural control methods, fungicides are an effective management tool in protecting faba bean crops from grain yield and quality losses caused seasonally by Chocolate Spot and Ascochyta blight. This trial was designed to address questions surrounding the issues of fungicide timing and whether the use of stickers prolongs fungicide effectiveness.

Methods

This trial was conducted using a fully replicated randomised block design.

The trial was sown on June 5 with two bean varieties – Fiesta VF and Aquadulce at 120 and 140kg/ha respectively. All beans were direct drilled into mulched wheat stubble with 80kg/ha Mallee Mix 1. All weed and insect control was conducted using normal rates of registered products.

The first application timing of fungicides was immediately after the first signs of foliar disease (July 30) and the second application was five weeks after the first application (September 6). All fungicide applications were made with a spray volume of 100L/ha.

All treatments were assessed and scored for disease incidence and severity in mid-October and taken through to harvest to ascertain grain yield.

Table 1: Treatments including product, active ingredients, timing, rate and cost.

Ttt #	Treatment	Active ingredient	Timing	Rate	Cost (\$/ha)
1	Mancozeb	<i>Mancozeb</i>	First sign of disease	1 kg/ha	7.60
2	Mancozeb + sticker	<i>Mancozeb</i>	First sign of disease	1 kg/ha	8.90
3	Mancozeb + Bavistan	<i>Mancozeb</i> + <i>Cardenbazim</i>	First sign of disease	1 kg/ha + 0.5L/ha	26.10
4	Mancozeb + Bavistan + sticker	<i>Mancozeb</i> + <i>Cardenbazim</i>	First sign of disease	1 kg/ha + 0.5L/ha	27.40
5	Mancozeb	<i>Mancozeb</i>	First sign of disease + 5 weeks later	1 kg/ha + 1 kg/ha	15.20
6	Mancozeb + sticker	<i>Mancozeb</i>	First sign of disease + 5 weeks later	1 kg/ha + 1 kg/ha	17.80
7	Mancozeb + Bavistan	<i>Mancozeb</i> + <i>Cardenbazim</i>	First sign of disease + 5 weeks later	1 kg/ha + 0.5L/ha + 1 kg/ha + 0.5L/ha	52.20
8	Mancozeb + Bavistan + sticker	<i>Mancozeb</i> + <i>Cardenbazim</i>	First sign of disease + 5 weeks later	1 kg/ha + 0.5L/ha + 1 kg/ha + 0.5L/ha	54.80

Results

The average yield at this site was 2.6 t/ha. Fungicide treatments did not significantly affect yield or grain quality at this site. There was no varietal response, nor was there any interaction between the application of a fungicide and the variety (refer Table 2).

Table 2: Yield results achieved for Fiesta VF and Aquadulce managed under eight different fungicide regimes.

Treatment	Rate	Timing	Yield (t/ha)	
			Fiesta VF	Aquadulce
Mancozeb	1 kg/ha	First sign of disease	2.41	2.57
Mancozeb + sticker	1 kg/ha	First sign of disease	2.66	2.50
Mancozeb + Bavistan	1 kg/ha + 0.5L/ha	First sign of disease	2.49	2.53
Mancozeb + Bavistan + sticker	1 kg/ha + 0.5L/ha	First sign of disease	2.54	2.44
Mancozeb	1 kg/ha + 1 kg/ha	First sign of disease + 5 weeks later	2.64	2.59
Mancozeb + sticker	1 kg/ha + 1 kg/ha	First sign of disease + 5 weeks later	2.67	2.64
Mancozeb + Bavistan	1 kg/ha + 0.5L/ha + 1 kg/ha + 0.5L/ha	First sign of disease + 5 weeks later	2.64	2.55
Mancozeb + Bavistan + sticker	1 kg/ha + 0.5L/ha + 1 kg/ha + 0.5L/ha	First sign of disease + 5 weeks later	2.67	2.58
Significant difference Fungicide Variety	-		NS NS	

No visual difference in disease presence or severity (Chocolate Spot or Ascochyta blight) was noted between any of the treatments when inspected mid-October. Both Chocolate Spot and Ascochyta were present, but at very low levels throughout the entire season. Grain quality results are summarised in Table 3.

Table 3: Percentage seed discolouration for each fungicide treatment for Fiesta VF and Aquadulce beans.

Ttt #	Seed discolouration %									
	Fiesta VF					Aquadulce				
	0	1-5	6-25	26-50	>50	0	1-5	6-25	26-50	>50
1	43	17	20	10	10	67	19	14	0	0
2	36	13	20	15	16	75	13	10	0	2
3	43	15	18	10	15	71	16	8	3	2
4	37	20	22	9	13	75	11	9	2	3
5	43	14	22	12	10	81	9	5	2	3
6	38	18	23	11	11	66	8	14	6	6
7	40	11	26	12	12	69	17	5	3	6
8	34	17	26	11	12	74	11	8	3	4

No significant difference could be detected between treatments for seed discolouration.

Interpretation

Owing to the late break in the season this trial was not sown until June 5. This resulted in low growth rates in the crop until late September and so the canopy was open minimising the risk of a severe disease infestation. Although not consistent, Fiesta VF did tend to have higher grain discolouration due to disease.

Commercial Practice

Multiple spraying of faba beans may be necessary to protect seed from discolouration even when disease levels are only low. Fiesta is more susceptible to seed staining than Aquadulce. Table 4 lists the disease resistance characteristics of commonly grown faba bean varieties. Fungicide options for controlling disease in faba beans are listed in Table 5. Note, seasonal conditions and disease pressures must always be taken into account when making a fungicide decision.

Table 4: Disease resistance characteristics for commonly grown faba bean varieties.

Variety	Ascochyta	Chocolate Spot	Rust
Manafest	S	MR	MR
Fiesta VF	MR-MS	MS	S
Fiord	S	S	S
Ascot	R	S	S
Icarus	VS	MR	MR
Aquadulce	S	S	S

Table 5: Fungicide options for foliar disease control in faba beans

	Ascochyta	Chocolate Spot	Rust
Timing 1 6-8 weeks post-em	Inspect crops. If wet season, treat if more than 1 lesions / plant	If >18 °C and humid treat if more than 5 spots / plant	-
Timing 2 Early flowering	Inspect crops. If wet season, treat if more than 5 lesions / plant	If >18 °C and humid treat if new spots on top third of plant	If rust observed
Timing 3 Pod fill	Inspect crops. Treat if more than 1 lesion on pods or new growth	If >18 °C and humid treat if new spots on new growth	If rust observed
Fungicide options	<i>Mancozeb</i> 1.5 kg <i>Chlorothalonil</i> 1 L	<i>Mancozeb</i> 1.5 kg <i>Chlorothalonil</i> 1 L <i>Carbendazim</i> 0.5 kg <i>Procymidone</i> 0.5 L	Mancozeb 1.5 kg/ah
Comments	Timing 2 is essential	Timing 2 is essential	Inspect at timing 2 and 3

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