SASKATCHEWAN pulse Growers

Pulse Replicated On-Farm Independent Trials

Faba Bean Pathogen Fungicide Efficacy Trial

The fungal pathogens identified as most concerning for faba bean producers are Stemphylium vesicarium, Stemphylium botryosum, Ascochyta fabae, Botrytis cinerea, and Botrytis fabae. Very few products are registered in faba bean with activity on Botrytis spp. and none registered with activity on Stemphylium spp. A final report on the efficacy of fungicide actives registered for use on faba beans can be submitted to the Prairie Pesticide Minor Use Consortium for label expansions after analyzing results for controlling and/or suppressing faba bean pathogens.

Objective

To evaluate fungicide active ingredient performance of four new fungicides on faba bean pathogens under typical field management practices.

Treatments

Treatments were arranged in randomized strips with three replicates. Fungicides were applied at optimal economic threshold timing for control of foliar leaf diseases.

Fungicide	Active Ingredient	Manufacturer	Rate	Diseases Controlled	Not Controlled
Miravis® Neo	Pydiflumetofen	Syngenta	75g/L	*Sclerotinia sclerotiorum, Phakopsora pachyrihizi, Colletotrichum truncatum*	*Botrytis fabae*
	Azoxystrobin		100g/L		*Stemphylium botryosum*
	Propiconazole		125g/L		*Ascochyta fabae*
RevyPro®	Mefentrifluconazole	BASF	50g/L	*Botrytis cinerea, Aschochyta spp., Sclerotinia sclerotiorum*	*Botrytis fabae*
	Prothioconazole		50g/L		*Stemphylium botryosum*
Delaro®	Prothioconazole	Bayer	175g/L	*Botrytis cinerea, Sclerotinia sclerotiorum*	*Botrytis fabae*
	Trifloxystrobin		150g/L		*Stemphylium botryosum*
					Ascochyta fabae
Zolera® FX	Fluoxastrobin	UPL	200g/L	*Mycosphaerella pinodes, Ascochyta spp., Phakopsora spp., Sclerotinia sclerotiorum*	*Botrytis fabae*
	Tetraconazole		200g/L		*Stemphylium botryosum*

Methodology

- Apart from fungicide treatments, all plots were managed the same agronomically.
- Treatments were applied at label rates and restrictions with a minimum of 10 US gal/ac of water at mid-flower or when 2–4 flowers were open on the main raceme of the majority of the field.
- Leaves were collected from across the field prior to fungicide application and submitted for DNA pathogen identification.
- Leaves were collected from new growth 14 days following application and submitted for DNA pathogen identification.
- Visual data was captured from each treatment 14 days following application evaluating differences between each treatment and the check.
- Composite grain samples were collected from each rep per treatment and submitted for quality analysis.

Data Collection

- Disease evaluation and efficacy assessments from new growth tissue samples
- Plant images comparing treatments to check
- Yield by plot
- Grain quality by treatment (grading, protein, moisture)
- General in-season observations and management actions
- Site characterization: soil test, seed test, field history and management, weather data

Faba Bean Fungicide Efficacy Trial
(Tisdale)

Objective: To determine the efficacy of fungicide applications on faba bean pathogens causing Chocolate Spot (Botrytis spp.), Stemphylium Blight, Alternaria oxford, and Sclerotinia stem rot.

Treatments:

1. RevyPro® (mefentrifluconazole + prothioconazole)
2. Miravis Neo® (pydiflumetofen + azoxystrobin + propiconazole)
3. Delaro® (prothioconazole + trifloxystrobin)
4. Zolera® (fluoxastrobin + tetraconazole)
5. Check

Replicates: Three

General Trial Information:	
Variety	Fabelle
Seeding date	May 6
Previous crop	Oats
Soil organic matter	5.6%
Residual Nitrate-N (0-24")	44 lb/ac $N0^{3-}$
Applied fertilizer	MAP at 80 lb/ac product + Nodulator Duo granular
Plant density / Row spacing	4 bu/ac seeding rate through 1" opener on 10" spacing

Fungicide Application:	
Date / Time	June 28 at 12:30 p.m.
Crop stage	5 open flowers per main stem
Tank mix	n/a
Water volume	12.8 gal ac^{-1}
Weather conditions	overcast, 19°C with 62% humidity

In-crop pesticide applications:	
June 5	Viper® ADV (imazamox + bentazon)
Sept.1	Diquat®

Results:

Treatment	Yield (lbs ac^{-1})	Yield (bu ac^{-1})	Plant stage (node)	Infection point (diseased node)
RevyPro®	2669	44.5	21.8	9.6
Delaro®	2807	46.8	21.1	10.5
Miravis Neo®	2572	42.9	21.7	9.2
Zolera®	2776	46.3	21.8	9.6
Check	2541	42.2	20.8	10.3
SE(1)	1.12		0.49	0.55
P-value (Treatment) (2)	*0.14*(3)		*0.21*	*0.52*

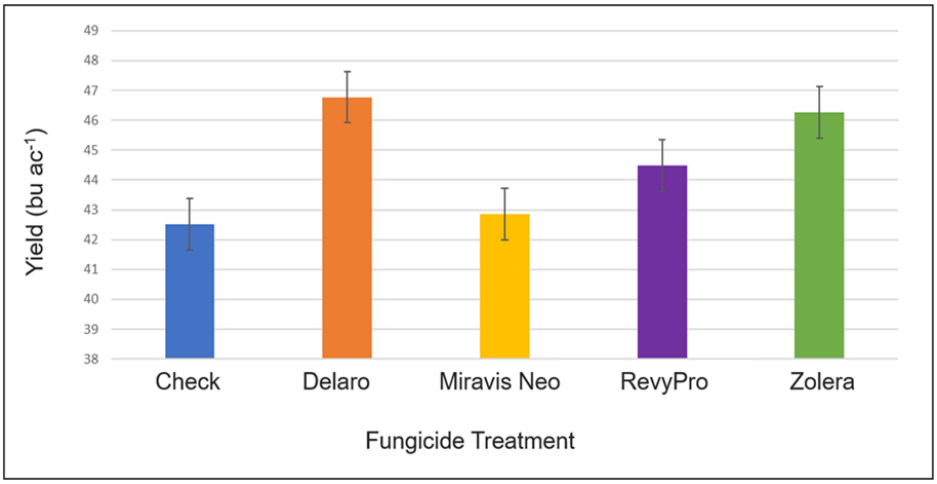

Fig. 1. Faba bean yield (bu/ac) for each fungicide treatment (n=15) collected at harvest in the fall of 2023 in Tisdale, SK.

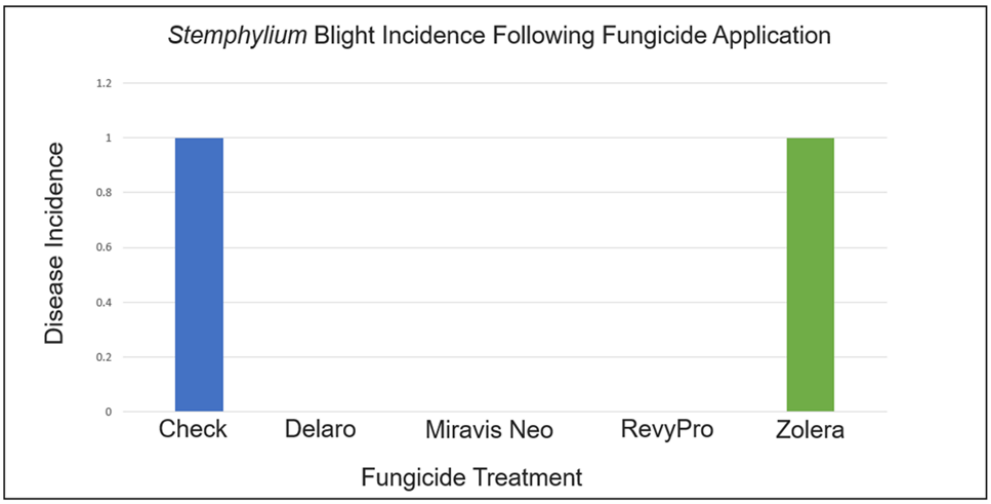

Fig. 2. Fungicide treatment efficacy on Stemphylium Blight (0 = negative; 1= positive) and yield response in faba bean at Tisdale, SK.

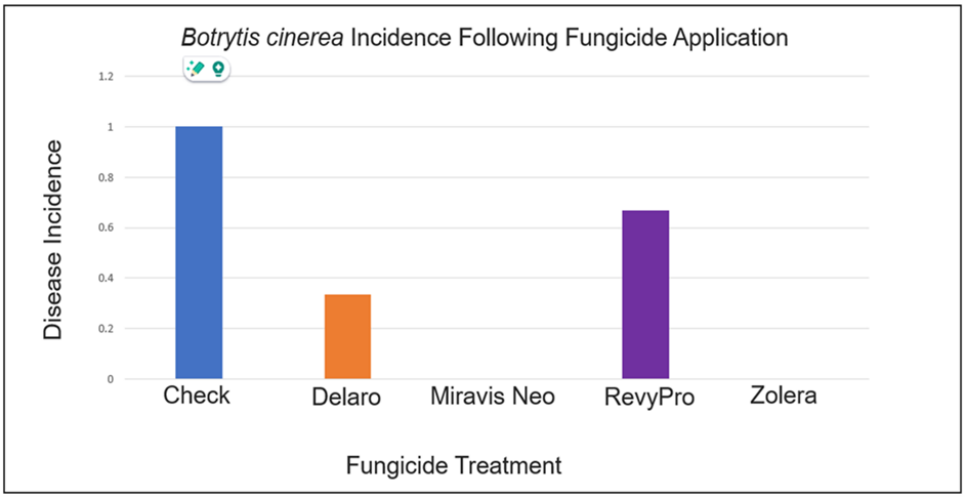

Fig. 3. Fungicide treatment efficacy on *Botrytis cinerea* (0 = negative; 1= positive) and yield response in faba bean at Tisdale, SK.

Summary:

There was no statistical difference in faba bean yield (Fig.1), plant stage, or visual infection point on the plant as a result of fungicide treatment. *Stemphylium* and *Botrytis cinerea* were confirmed on diseased plant samples collected during the efficacy check. As seen in Fig. 2, all fungicide products controlled *Stemphylium blight* except Zolera, while RevyPro was the only product without efficacy on *Botrytis cinerea* (Fig. 3). *Alternaria* and *Ascochyta* were detected in all samples but none of the fungicides tested had activity on those pathogens. *Sclerotinia* and *Botrytis fabae* were not detected in any samples collected. While there was no significant impact on yield, differences were observed in disease control where Miravis Neo had the greatest efficacy on fungal pathogens but yielded the least (Fig.1).

1. SE is the standard error which is in the same unit as the measurement and indicates the level of variability or uncertainty in the data.
2. The P-value indicates the statistical significance or likelihood that the measured difference was a result of the treatment:
   P < 0.01 = Very likely; Very high probability that the difference was due to the treatment (***)
   P < 0.05 = Likely; Good probability that the difference was due to the treatment (**)
   P < 0.1 = Possibly; Moderate probability that the difference was due to the treatment (*)
   P > 0.1 = Not likely; Probability too low to confirm if the difference was due to the treatment (not significant)
   ** Where P < 0.05, treatment differences are shown in summary tables.
3. *P-value (Treatment)* indicates the likelihood of a difference resulting from fungicide application.

This trial was conducted with the agronomic support of