

SEPTORIA CONTROL IN THE MRZ

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TAKE HOME MESSAGES

- Septoria tritici blotch (STB) is a developing issue in the low to medium rainfall zones as a result of variety selection and farming system practices.
- Even though STB is present, fungicide control is not always warranted in the MRZ.
- Best practice management for STB outside the HRZ is still not fully understood.

BACKGROUND

Septoria tritici blotch (STB), a major disease of wheat in high rainfall cropping zones, is becoming more prevalent in the medium and low rainfall zones. In high rainfall environments STB can regularly cause losses up to 20% (GRDC, 2014), but the impact outside this region is less understood.

STB is a stubble borne disease. Early in the season following autumn rains the stubble releases wind borne spores across the district affecting early sown wheat crops. Symptoms of STB on lower (older) leaves within a crop are characterised by lesions containing black dots (spore fruiting bodies called pycnidia). These fruiting bodies produce rain splashed spores that, during wet conditions, can move to infect the upper canopy. Wet conditions are critical for this secondary spread within the crop.

While STB control is well understood in the high rainfall zone, the economic thresholds of when to apply fungicides for the control of STB in medium and low rainfall zones is not known. This trial aimed to provide information around the risk of disease development and the economic impact of management applications outside the high rainfall zone, where STB management is required in most seasons.

BCG carried out research in 2019 in Kalkee. This work found that with the seasonal conditions experienced in 2019 – a good start followed by a dry spring – resulted in low levels of disease at tillering. This did not develop further during the spring, making fungicide application for STB non economical (Clarke and Hollaway, 2019).

Some of the chemicals used in this trial do not currently have a registered use pattern for STB and were used for experimental purposes only.

AIM

To assess the impact of Septoria tritici blotch (STB) on wheat varieties in the Wimmera and to evaluate fungicide control options.

PADDOCK DETAILS

Location:	Kaniva
Crop year rainfall (Nov-Oct):	432mm
GSR (Apr-Oct):	325mm
Soil type:	Clay
Paddock history:	Oaten hay

TRIAL DETAILS

Crop type/s:	Wheat
Treatments:	Refer to table 1
Target plant density:	140 plants/m ²
Seeding equipment:	Knife points, press wheels, 30cm row spacing
Sowing date:	26 May 2020
Replicates:	Four
Harvest date:	20 December 2020
Trial average yield:	4.6t/ha

TRIAL INPUTS

Fertiliser:	Granulock® Z @ 60kg/ha at sowing + 80kg/ha urea on 7 July + 100kg/ha urea on 25 August
Herbicide:	Trial managed as per best practice
Insecticide:	Trial kept pest free
Fungicide:	See table 1
Seed treatment:	Vibrance® @360mL/100kg + Gaucho® @ 240mL/100kg

METHOD

A replicated field trial was sown using a complete randomised block design. Disease severity was visually scored (based on percentage of leaf area displaying STB symptoms throughout the plot). Grain yield and grain quality were measured at harvest to determine disease impact and the efficacy of the various disease management strategies.

Five fungicide treatments were applied at Z31 targeting lower leaf infection. An untreated control was included as a comparison. The range of fungicides selected aimed to cover different actives and price points. Differing from the 2019 trial, this experiment also included Elatus® Ace, a newly registered fungicide for the control of STB that combines two actives with different modes of action (Group 3 and 7).

Table 1. Trial treatment outline. Fungicide applications made with a hand boom at growth stage Z31 (25 August 2020).*

Variety (STB resistance rating*)	Product	Fungicide group	Rate	Cost of Fungicide \$/ha
Razor CL Plus (SVS)	Untreated control	-	-	0
Scepter (S)	Propiconazole 250	3	0.5L/ha	7
Beckom (S)	Epoxiconazole	3	0.5L/ha	14
	Prosaro®	3	0.3L/ha	22
	Aviator® Xpro®	3/7	0.5L/ha	27
	Elatus® Ace	3/7	0.5L/ha	20

*Source: Ag. Vic., Victoria Cereal Disease Guide 2020

RESULTS AND INTERPRETATION

Disease presence

In this season, very low levels of STB infection were observed across the trial however, all varieties displayed symptoms – mainly on the lower leaves. Visual scores of disease severity, showed variation between fungicide treatments two weeks ($P=0.004$) and seven weeks ($P<0.001$) following fungicide application (Figure 1). At both score timings, untreated control treatments (no fungicide applied) had more STB symptoms relative to all fungicide treatments suggesting fungicide application did have some effect on reducing STB severity.

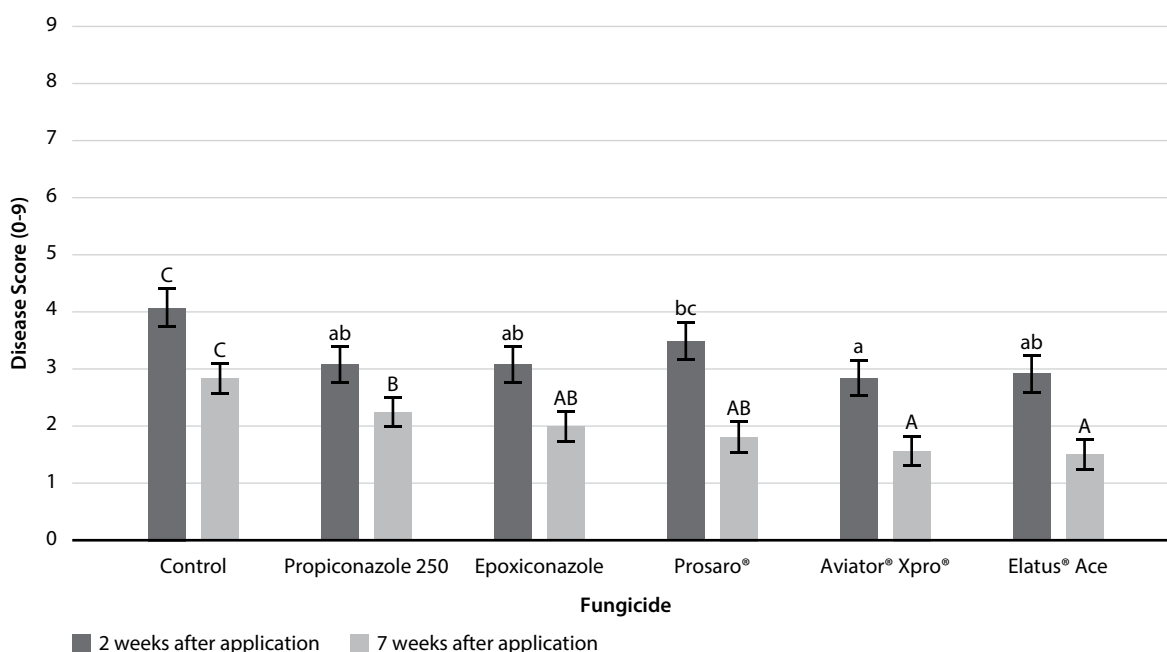


Figure 1. Disease severity (0-9 scale where 0= no STB symptoms present, 9= 100% of plants >50% leaf area with STB symptoms) taken two weeks and seven weeks after fungicide application. Within each score timing lettering denotes significant different results. Error bars are LSD ($P=0.05$). Two weeks post application $P=0.004$, LSD= 0.7, CV 24.8%. Seven weeks post application $P<0.001$, LSD= 0.5, CV 32.2%.

Yield and quality

Fungicide application had no significant effect on yield in this trial ($P=0.66$). A yield difference was found between varieties where Razor CL Plus out yielded Beckom, while Scepter had a similar yield to the other two varieties (Table 2).

Table 2. Mean yield (t/ha), protein (%) and screenings (%) of varieties across fungicide treatments.

Variety	Yield (t/ha)	Protein (%)	Test weight (Kg/hL)	Screenings (%)
Razor CL Plus	4.65 ^a	9.0 ^b	80.5 ^c	3.3
Scepter	4.57 ^{ab}	9.5 ^a	81.3 ^b	3.7
Beckom	4.50 ^b	9.6 ^a	81.9 ^a	3.5
Sig. diff.	0.036	0.001	<0.001	0.07
LSD (P=0.05)	0.11	0.3	0.3	NS
CV%	4.2	5.2	0.5	15.3

There were differences in grain quality measurements between varieties (Table 2). Fungicide treatment had a small yet significant ($P = 0.02$) effect on test weight but this difference had no effect on final grain quality and price.

COMMERCIAL PRACTICE AND ON-FARM PROFITABILITY

Even though there were low levels of STB present within this trial early in the season it did not affect grain yield or quality. This finding was similar to that of 2019 (with a decile 1 spring) where low levels of disease did not reduce grain yield. This tells us that STB, even when present in the MRZ, will not always require control.

Factors that contributed to low disease pressure in this trial included: late sowing time, dry conditions throughout tillering when primary infection of STB is likely to occur and drier than average conditions throughout spring – the period when secondary infection from rain splash is likely to occur. We know that STB risk is much greater in early sown susceptible crops when wet seasonal conditions occur.

It was positive that all fungicides evaluated provided some suppression of STB but due to the low disease pressure it was not possible to compare relative efficacy. The results of this trial suggest it would not have been economic to apply fungicide for the control of STB as there was no yield loss from untreated control treatments based on the level of disease present. Table 3 shows the additional yield benefit required from each of the fungicides evaluated required to provide an economic benefit. It is of interest to note that with Prosaro® coming off patent that the cost of this fungicide has the potential to drop significantly.

Table 3. Fungicide application cost (\$/ha) and additional yield required to cover the fungicide cost (kg/ha) based on ASW1 grain price of \$252/ton at Dooen on 22 December 2020.

Fungicide	Application rate	Fungicide cost (\$/ha)	Additional yield required (kg/ha)
Untreated control	-	0	0
Propiconazole 250	0.5L/ha	7	30
Epoxiconazole	0.5L/ha	14	60
Prosaro®	0.3L/ha	22	90
Aviator® Xpro®	0.5L/ha	27	110
Elatus® Ace	0.5L/ha	20	60

With resistance to fungicides within STB a real concern it is important to adopt strategies when using fungicides that will help protect the available fungicides from resistance breakdown. Best practice is to only apply fungicides if absolutely necessary. If fungicides are required, apply products that contain mixtures of active ingredients (e.g. Prosaro®). An even better option is if they contain mixtures of actives from different modes of action (e.g. Aviator® Xpro® or Elatus® Ace). Also, do not apply more than one chemical from Group 7 or 11 in any one season, and don't apply the same Group 3 active in consecutive applications.

In the MRZ and LRZ growers where possible should avoid early sowing of highly susceptible cultivars where wheat stubble is present. During seasons with continual wet weather susceptible crops should be monitored for symptoms of STB low in the canopy with a view to apply a timely fungicide if warranted.

Research into conditions/infection levels of STB that economically warrant a fungicide application will continue in the coming years to help best practice management plans in the low to medium rainfall zones, where management recommendations will differ from those in the high rainfall zone.

REFERENCES

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