

SEPTORIA OUTSIDE THE HIGH RAINFALL ZONE

Genevieve Clarke (BCG) and Grant Hollaway (Agriculture Victoria)

TAKE HOME MESSAGES

- Septoria tritici blotch (STB) is a stubble-borne disease of wheat becoming more prevalent in medium rainfall zones.
- There were low levels of STB development in susceptible varieties in the Wimmera in 2019.
- Avoiding highly susceptible varieties reduced disease severity.
- During a season with a dry spring, fungicide application was not warranted.

BACKGROUND

Septoria tritici blotch (STB) is a stubble-borne fungal disease of wheat. Frequent rain events and extended periods of moist conditions will increase risk of infection from this disease. During wet seasons when susceptible wheat varieties are grown, yield losses can be greater than 20 per cent (GRDC 2014). Early sowing, retention of stubble, wheat on wheat rotations and selecting susceptible varieties increase the risk of STB.

Inoculum of the STB fungus survives from one season to the next on stubble. Early in the season – as temperatures drop along with the opening rains – wind-borne spores are released from the stubble and can spread across large distances. STB develops first on the lower leaves of wheat, producing lesions that contain visible black fruiting bodies (pycnidia) (Figure 1). These produce inoculum for secondary infection when rain-splashed spores cause disease higher up in the canopy. This secondary spread of the disease up the plant is reliant on wet conditions. STB is a regular issue in high rainfall cropping zones and in the Wimmera during wetter seasons.

Figure 1. Black fruiting bodies (pycnidia) within the lesions are a characteristic of Septoria tritici blotch as observed on the lower leaves of Scepter wheat at Kalkee, August 2019.



Avoiding susceptible varieties provides the most effective control of STB, but currently there are a lack of suitable options for Wimmera growers. Therefore, growers must also consider fungicide strategies along with rotations for controlling this disease during wet seasons.

Fungicide control options are available to control STB. Cost varies, depending on the method of application. This article helps to put into context the potential impact of STB on yield and the economics behind applications of different fungicide options.

AIM

To assess the impact of Septoria on wheat varieties in the Wimmera and effectiveness of fungicide options for control.

PADDOCK DETAILS

Location:	Kalkee
Crop year rainfall (Nov-Oct):	363mm
GSR (Apr-Oct):	254mm
Soil type:	Clay
Paddock history:	2018 Lentil

TRIAL DETAILS

Crop type:	Wheat
Treatments:	Refer to Table 1
Target plant density:	140 plants/m ²
Seeding equipment:	Knife points, press wheels, 30cm row spacing
Sowing date:	21 May 2019
Replicates:	Four
Harvest date:	5 December 2019

TRIAL INPUTS

Fertiliser:	Granulock® Supreme Z @ 60kg/ha at sowing and 100kg/ha of urea applied 21 July, 1 August and 22 August.
Herbicide:	21 May – Trifluralin @ 1.5L/ha + Avadex @ 2L/ha + Sakura® @ 118g/ha applied IBS 2 July – Velocity® @ 670mL/ha + MCPA LVE @ 400mL/ha + Lontrel® @ 125mL/ha + Hasten @ 1%
Insecticide:	Managed to best practice
Fungicide:	Refer to Table 1
Seed treatment:	Vibrance® @ 360mL/100kg + Gaucho® @ 240mL/100kg

METHOD

A replicated field trial was sown using a complete randomised block design. Assessments included establishment scores, disease scores, NDVI measurements taken by drone imagery and yield and quality assessments.

Table 1. Trial treatment outline.

Variety (Septoria resistance rating) ^a	Fungicide applied @GS32	Rate (L/ha)
Razor CL Plus (SVS)	Control	-
Scepter (S)	Propiconazole 250	0.5
Beckom (MSS)	Opus® 125	0.5
	Prosaro®	0.3
	Aviator® Xpro	0.5

a. Hollaway and McLean (2019) Victorian Cereal Disease Guide 2019, Agriculture Victoria.

RESULTS AND INTERPRETATION

Disease presence

At Kalkee, the 2019 season began with potential, receiving a 20mm break on May 1 and several rainfall events throughout the winter months. Low levels of STB were present across the trial from tillering leading up to spring in all varieties. Conditions did not remain conducive to STB development, the Decile 1 spring resulted in an overall Decile 3 growing season. Disease scores taken six weeks after fungicide application reflected the low disease presence, but also the discernible visual differences in STB between varieties and sprayed and unsprayed treatments (Figure 2).

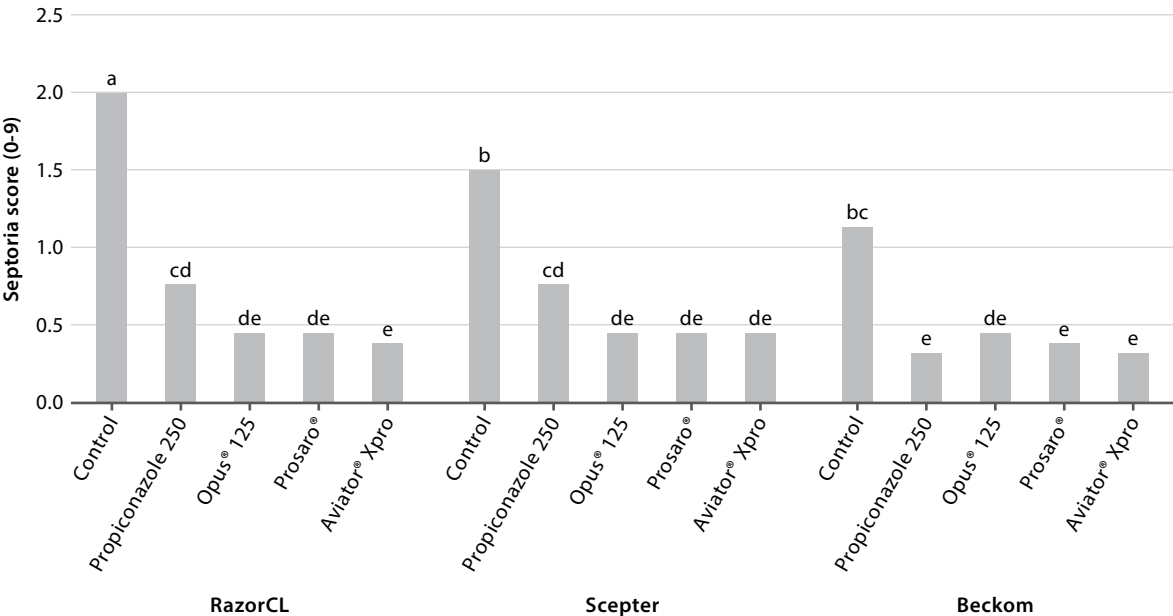


Figure 2. Mean Septoria disease scores (0-9, 0=no disease) taken 6 weeks after fungicide application at Kalkee by visual inspection (Var x Fungicide P=0.032, LSD= 0.357). Different letters indicate significant difference.

Yield

There were differences in yield between varieties, with Beckom out yielding Razor CL Plus and Scepter, in the middle (Table 3). Yield differences were not significant between fungicide treatments, suggesting STB did not limit yields within this trial.

Table 3. Mean yield (t/ha) of varieties across treatments. Letters indicate significant difference.

Variety	Yield (t/ha)
Razor CL Plus	4.4 ^a
Scepter	4.5 ^{ab}
Beckom	4.7 ^b
	Sig. diff.
	LSD (P=0.05)
	CV%
	0.013
	0.1618
	5.6

Quality

Grain quality differed between varieties but was not affected by fungicide treatment (data not shown). Average protein was 11.8 per cent and was consistent across varieties however, Beckom had 5.4 per cent screenings, Razor CL Plus 2.9 per cent and Scepter 2.7 per cent.

COMMERCIAL PRACTICE

In seasons with continual wet conditions STB can cause yield losses of more than 20 per cent in susceptible varieties. During 2019, the Decile 1 spring did not favour the development of STB in the Wimmera, but the field trial did show differences in STB development in the three varieties with contrasting susceptibility. As expected, due to disease ratings, the highest disease level was in Razor CL Plus and the lowest in Beckom (Figure 2). STB did not affect grain yield due to the dry conditions not supporting disease development.

All fungicide treatments provided some suppression of STB (Figure 2), but the dry conditions made it impossible to draw conclusions about the relative efficacy of the products being evaluated.

Had conditions been wet during the late winter and early spring, disease might have progressed up the upper canopy and fungicides may have been warranted for disease control. In a high-risk situation for STB, an initial fungicide application may be required between GS31-32 for suppression of the disease, followed by a second application at flag leaf emergence (GS39) to protect the upper canopy.

Due to the low levels of STB development in this trial, investment in a fungicide application resulted in a loss of the cost of application with no yield increase. Seasonal conditions, particularly those likely during spring, must be considered when deciding whether fungicide application is required. As well as the cost of fungicide and application, there is the risk of fungicide resistance developing. Consider:

- avoiding the use of highly susceptible cultivars when possible
- using crop rotation to avoid planting into infected wheat stubble
- applying effective seed treatments to suppress early disease development
- only spraying fungicides when required
- always following the label recommendations
- if possible, using fungicides that mix modes of action and avoiding application of the same active ingredient more than once in a crop.
- When considering options to prevent infection from STB, it is important to remember that spores shelter in retained wheat stubble. Most STB infection in the low to medium rainfall zones occurs at early growth stages so managing disease risk before sowing, through paddock selection, rotation, variety choice, seed dressing and sowing time can help reduce reliance on fungicide applications.

REFERENCES

GRDC, 2014, *Septoria tritici blotch fact sheet*, 'Managing Septoria tritici blotch in wheat', Accessed 18 December 2019, https://grdc.com.au/__data/assets/pdf_file/0023/159341/final-septoria-tritici-blotch-fact-sheet-hr-pdf.pdf

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