

4.6 Stem rust control in wheat - Inverleigh, Vic

Location: SFS Inverleigh Research Site

Funding:

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Researcher(s):

Nick Poole, Tracey Wylie (FAR) and Jon Midwood (SFS)

Author(s):

Nick Poole & Tracey Wylie
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Background/Aim:

To evaluate the efficacy of different foliar fungicides against stem rust (*Puccinia graminis f.sp. tritici*) in wheat. To account for possible shortages in foliar fungicide supply, products were tested over as wide a rate range as possible (*N.B. Use of products and rates lower than label rates in this trial does not constitute a recommendation*).

Rainfall:

Avg. Annual:	548
Avg. G.S.R:	408
2011 Total:	579
2011 G.S.R:	361

Cultivar: Beaufort (Susceptible-S rating for stem rust)

Summary of findings:

Stem rust control

- High rates of fungicide (in most cases the recommended rate on the label) gave significantly superior stem rust control compared to the low rate tested when assessed on the leaf sheaths of the plant 27 and 50 days after application.
- Propiconazole (Tilt) gave significantly poorer stem rust control than the other fungicides tested at full label rates (or high rates).

Yield data

- The average response to fungicide was 9% at the low fungicide rate, 17% at the mid-rate and 16% at the high rate, though there was no statistical difference between fungicide rates
- All products tested at the highest rate of fungicide application significantly increased yield, except Prosaro and Tilt Xtra. Opus and Amistar Xtra were the only two products to significantly out yield the untreated at all three rates tested.



Image 1. Stem rust infection on the stem – Inverleigh, Victoria

Treatment list:

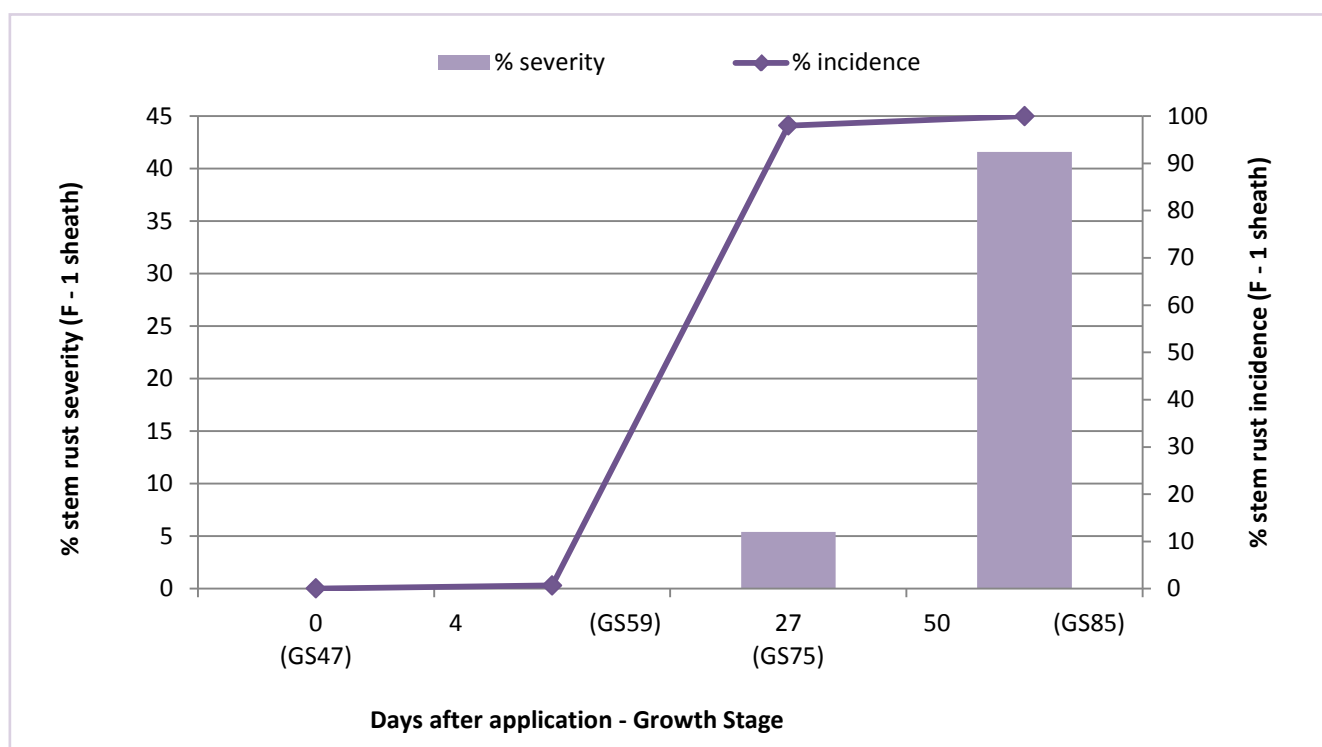
The trial was set up at the SFS Inverleigh site in an unsprayed block of wheat cv. Beaufort (Susceptible-S rating for stem rust). In this trial the treatments outlined in Table 1 were sprayed prophylactically at approximately 80% ear emergence (GS58) on the 27 October, with less than 1% disease incidence in the crop. No other fungicides were applied to the trial.

Table 1. Fungicide treatment and formulation, application rate and active ingredient content (label rate for stem rust highlighted where label recommendation exists).

	Fungicide treatment & rate (ml/ha)	Active ingredient (g/ha ai)
1	Prosaro 420SC 75 ml/ha + Hasten 1% v/v	Prothioconazole 15.6+ Tebuconazole 15.6
2	Prosaro 420SC 150ml/ha + Hasten 1%v/v	Prothioconazole 31.3+ Tebuconazole 31.3
3	Prosaro 420SC 300ml/ha + Hasten 1 %v/v	Prothioconazole 62.5+ Tebuconazole 62.5
4	Opus 125SC 125 ml/ha	Epoxiconazole 15.6
5	Opus 125SC 250 ml/ha	Epoxiconazole 31.3
6	Opus 125SC 500ml/ha	Epoxiconazole 62.5
7	Amistar Xtra 280SC 200 ml/ha	Azoxystrobin 40 + Cyproconazole 16
8	Amistar Xtra 280SC 400 ml/ha	Azoxystrobin 80 + Cyproconazole 32
9	Amistar Xtra 280SC 800 ml/ha	Azoxystrobin 160 + Cyproconazole 64
10	Tilt 250EC 125 ml/ha	Propiconazole 31.3
11	Tilt 250EC 250 ml/ha	Propiconazole 62.5
12	Tilt 250EC 500 ml/ha	Propiconazole 125
13	Tilt Xtra 330EC 125 ml/ha	Cyproconazole 10 + Propiconazole 31.3
14	Tilt Xtra 330EC 250 ml/ha	Cyproconazole 20 + Propiconazole 62.5
15	Tilt Xtra 330EC500 ml/ha	Cyproconazole 40 + Propiconazole 125
16	Folicur 430SC 72.5 ml/ha	Tebuconazole 31.3
17	Folicur 430SC 145 ml/ha	Tebuconazole 62.5
18	Folicur 430SC 290 ml/ha	Tebuconazole 125
19	Opera 147SC 250 ml/ha	Pyraclostrobin 21.3 + Epoxiconazole 15.6
20	Opera 147SC 500 ml/ha	Pyraclostrobin 42.5 + Epoxiconazole 31.3
21	Opera 147SC 1000 ml/ha	Pyraclostrobin 85 + Epoxiconazole 62.5
22-24	Untreated	

In the 50 days following application infection increased to 95-100% incidence on the peduncle and top leaf sheaths and between 12 and 42% severity depending on which part of the stem was assessed (Flag – 1 sheath, Figure 1)

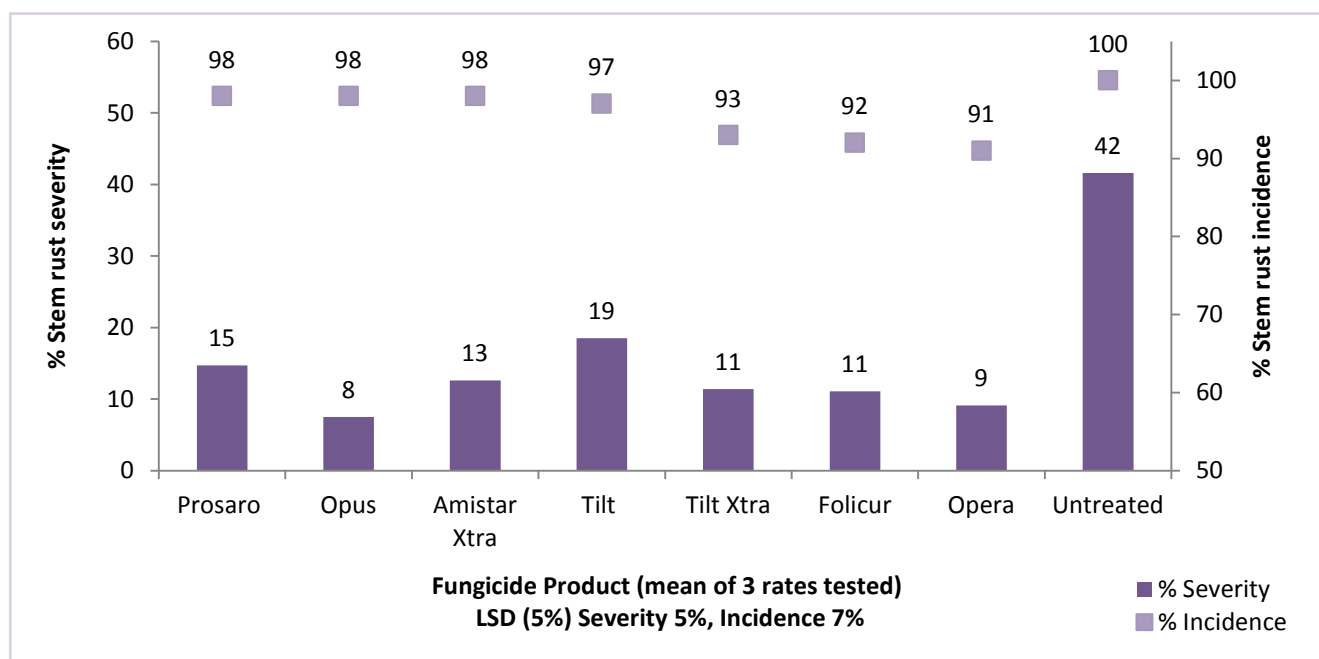
Figure 1. Stem rust development (% incidence & severity) on the flag – 1 leaf sheath of the **untreated crop 4**, 27, and 50 days following treatment application on the 27th October – Inverleigh, VIC.



Influence of fungicide product on stem rust incidence and severity (mean of 3 fungicide rates):
(assessed 50 days after application)

All fungicide products significantly reduced stem rust disease severity (Figure 2).

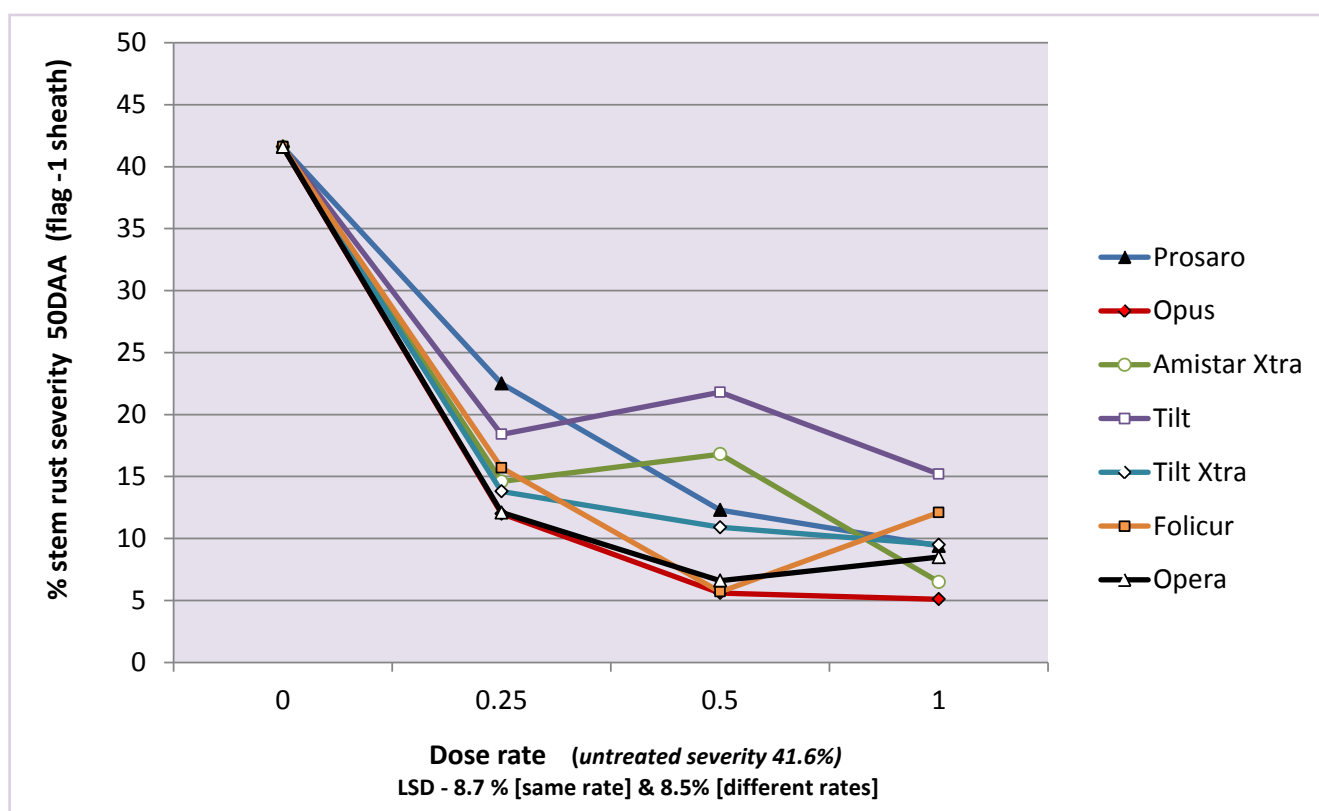
Figure 2. Influence of fungicide product on stem rust severity and incidence, flag – 1 sheath, 50 days after fungicide application (mean of 3 rates of application) – Inverleigh, VIC.



Influence of fungicide product and rate on stem rust incidence and severity:

All fungicide treatments irrespective of product and rate applied gave significant control of stem rust when assessed 50 days after fungicide application. Propiconazole (Tilt) gave significantly poorer control of stem rust than the other fungicides tested at full label rates (or high rates).

Figure 3. Influence of fungicide product and rate on stem rust infection on the flag - 1 leaf sheath (% severity) assessed 50 days after fungicide application – Inverleigh, VIC.



Yield Results (t/ha) and % of untreated control:

Yields were variable in this trial and did not allow fungicide products and rates to be differentiated. At the highest rate of fungicide application all products except Tilt Xtra and Prosaro significantly out yielded the untreated control. Two products significantly out yielded the untreated at all three application rates tested, these were Opus and Amistar Xtra (Table 2).

Table 2. Influence of fungicide product and rate on yield (t/ha & % relative to untreated control) harvested 4th January, 2012 cv Beaufort, Inverleigh, VIC.

Fungicide	Yield t/ha & % control								
	Low Rate			Mid Rate			High Rate		
treatment	t/ha		%	t/ha		%	t/ha		%
Prosaro + Hasten	4.6	c-d	101	5.59	a-c	123	4.91	b-d	108
Opus	5.25	a-d	115	5.68	ab	125	5.39	a-c	118
Amistar Xtra	5.65	ab	124	6.04	a	133	5.77	ab	127
Tilt	5.44	abc	119	5.07	a-d	111	5.27	a-d	116
Tilt Xtra	4.26	d	94	5.08	a-d	112	5.1	a-d	112
Folicur	5.18	a-d	114	4.77	b-d	105	5.2	a-d	114
Opera	4.28	d	94	5.07	a-d	111	5.39	a-c	119
Untreated	5.12		100						
Mean	4.95		109	5.33		117	5.29		116
LSD [Treatment comparisons at same rate] – 1.01 t/ha									
LSD [Treatment comparisons at all rates] – 1.05 t/ha									
LSE [Treatment comparisons to untreated] – 0.71 t/ha									