

4. FUNGICIDE TRIALS

4.1 WHEAT

4.1.1 FUNGICIDE PRODUCT COMPARISON/TIMING TRIAL - LAKE BOLAC

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Location: SFS Site Lake Bolac

Funding: Southern Farming Systems Ltd

Variety: Kellalac

Objectives:
The trial evaluated a range of fungicide products applied as single doses on the flag leaf (GS39), versus two spray programmes applied at GS32 (second node) + 39. The trial assessed product performance on the basis of disease control and yield.

Summary:

The maximum response to fungicide in a trial with severe levels of leaf rust was 17% with a range of yield increases from -3% to 17%. Four weeks after fungicide application at flag leaf there were few differences in product performance with all products performing well, however after nearly 6 weeks there were clear differences indicating that the newer products, namely Amistar Xtra (a strobilurin/triazole mix) and Opus (new triazole – epoxiconazole) were giving better protection against leaf rust.

Background:
Leaf rust (*Puccinia recondite*) is a common disease in wheat and barley throughout southern Victoria. The following trial was set up to determine the differences in persistence between the commonly used fungicides and new materials about to be introduced.

Whilst plot yields were variable due to differential senescence disease rankings gave a reasonable correlation with yield scores, indicating that the green leaf retention associated with the better fungicides did lead to higher yields.

Overall there was no indication of statistically significant benefits to an additional early fungicide at GS32 in this trial, yet visually there was a clear benefit in green leaf retention on lower leaves from an application at this timing when assessed at flag leaf. This difference however was not sustained through the second half of the season when leaf rust became dominant.

Table 34: Treatment List and Trial Design

trt	GS32 (leaf 3 emergence) 8 th September	GS39 (Flag leaf emergence) 24 th October
1	Nil	Nil
2	Bumper 250ml	Bumper 250ml
3	Nil	Bumper 250ml
4	Folicur 145ml	Folicur 145ml
5	Nil	Folicur 145ml
6	Tilt Xtra 250ml	Amistar Xtra 400ml
7	Nil	Amistar Xtra 400ml
8	Opus 250ml	Opus 250ml
9	Nil	Opus 250ml

Kellalac wheat was treated with 8 different fungicide treatments as in Table 34.

All products expressed in terms ml of product per hectare. All treatment plots were replicated 3 times.

Disease Assessments:

Early season yellowing was observed in all plots, with a suggestion from the flag leaf assessment that fungicide application was giving partial control of this yellowing. Leaf rust infection was noted to build up from flag leaf onwards. The following tables of results illustrate the influence of fungicide treatment and timing on leaf rust infection.

Table 35: Influence of Fungicide Treatment on Leaf Rust Infection of the Top 3 Leaves 7 Days after Application

Treatment (ml/ha)	% Leaf Affected by Rust		
	Flag	Leaf 2	Leaf 3
1 UTC	1.97	9.8	14.8
2 Bumper 250ml(GS32 + 39)	0.57	5.9	9.1
3 Bumper 250ml (GS39)	0.37	7.6	16.7
4 Folicur 145ml (GS32 + 39)	0.73	5.8	8.0
5 Folicur 145ml (GS39)	0.97	5.5	10.0
6 Tilt Xtra 250 ml (GS32) + Amistar Xtra 400 ml (GS39)	0.67	4.3	7.2
7 Amistar Xtra 400ml (GS39)	0.07	4.1	7.3
8 Opus 250ml (GS32 + 39)	0.40	3.4	4.5
9 Opus 250ml (GS39)	0.43	5.0	10.0

Table 36: Influence of Fungicide Treatment on Leaf Rust Infection on the Top 3 Leaves 26 Days After Application

Treatment	% Leaf Affected by Rust		
	Flag	Leaf 2	Leaf 3
1 UTC	15.25	35.31	25.00
2 Bumper 250ml (GS32+39)	1.15	10.83	18.75
3 Bumper 250ml (GS39)	0.55	10.69	21.25
4 Folicur 145ml (GS32+39)	1.30	16.39	25.00
5 Folicur 145ml (GS39)	1.40	11.95	19.16
6 Tilt Xtra 250 ml (GS32) + Amistar Xtra 400 ml (GS39)	0.20	2.34	5.49
7 Amistar Xtra 400ml (GS39)	0.15	3.05	6.06
8 Opus 250ml (GS32+39)	0.45	4.20	6.41
9 Opus 250ml (GS39)	0.25	3.36	8.20

Table 37: Influence of Fungicide Treatment on Leaf Rust Infection and (% Control) on the Flag Leaf 38 Days After Application (DAA)

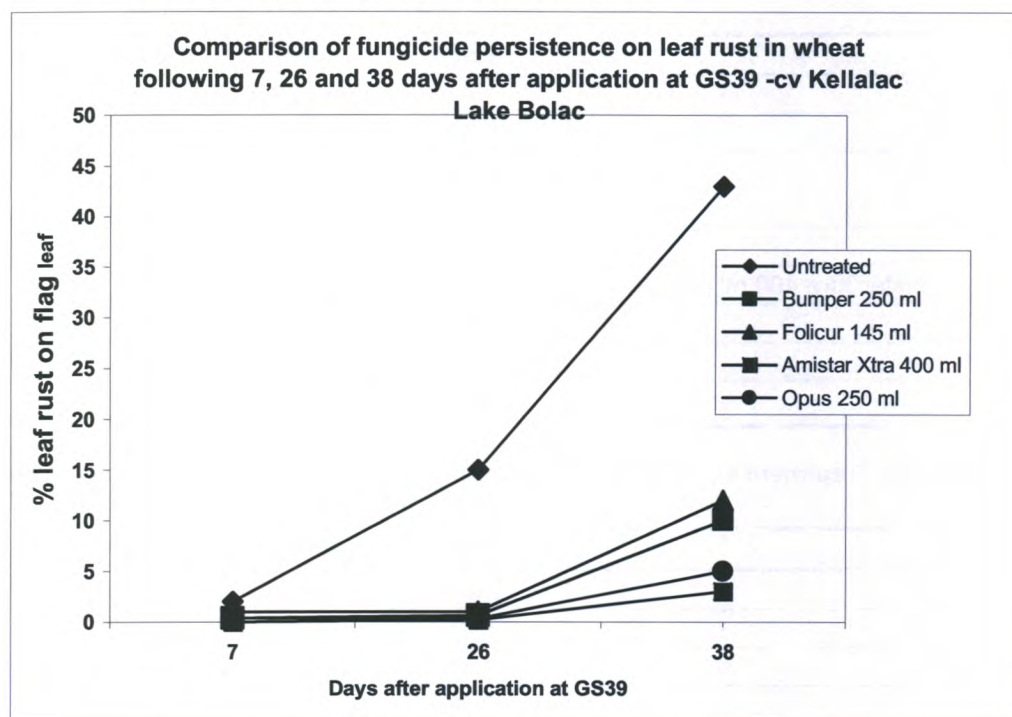
Treatment	% leaf rust on flag leaf	% Control of leaf rust 38 DAA
1 UTC	42.8	0
2 Bumper 250ml (GS32+39)	10.8	75
3 Bumper 250ml (GS39)	10.2	76
4 Folicur 145ml (GS32+39)	12.8	70
5 Folicur 145ml (GS39)	12.1	72
6 Tilt Xtra 250 ml (GS32) + Amistar Xtra 400 ml (GS39)	2.6	94
7 Amistar Xtra 400ml (GS39)	2.5	94
8 Opus 250ml (GS32+39)	6.1	86
9 Opus 250ml (GS39)	5.0	88

Despite visual differences in "Kellalac yellowing" due to the GS32 fungicide application, there was no advantage to an early GS32 fungicide in terms of leaf rust control, assessed in the second half of the season. With nearly 50% destruction of the flag leaf with leaf rust, this was an excellent opportunity to differentiate between products and timings. At the 26 day assessment (Table 36) there were only small differences in fungicide performance, however at 38 days the different

persistence of products was exposed. The best leaf rust control was given by the strobilurin/triazole mixture, which gave 94% control of disease over 5 weeks after application.

Of the triazoles it was the new material epoxiconazole (Opus) that gave the best results being superior to Folicur and Bumper which gave similar levels of control.

Figure 6: Influence of Fungicide Treatment on Leaf Rust Infection and (% Control) on the Flag Leaf 7,26 & 38 Days After Application (DAA)



Results:

The variable nature of the plot yields (due to differential drought effects) made it difficult to draw firm conclusions (Table 38), thus it was not possible to conclude that there was an overall response to fungicide (when all treatments were taken into account), in addition though individual differences were large and unexplainable in some cases, there was no statistical difference between 1 and 2 sprays, when all treatments were averaged.

There was general trend for those treatments that produced the best disease control to produce the highest yields e.g. Tilt Xtra/Amistar Xtra 2 spray programme and 2 spray Opus programme (however there were notable exceptions).

When 1 and 2 spray programmes were averaged the rank order of yield performance correlated much more strongly to the disease scores (Table 39).

Table 38: Yields t/ha (% Untreated Control)

trt	GS32 (leaf 3 emergence)	GS39 (Flag leaf emergence)	Yield T/Ha	% control
1	Nil	Nil	5.37	100
2	Bumper 250ml	Bumper 250ml	5.48	102
3	Nil	Bumper 250ml	5.46	102
4	Folicur 145ml	Folicur 145ml	5.22	¹ 97
5	Nil	Folicur 145ml	5.95	111
6	Tilt Xtra 250ml	Amistar Xtra 400ml	6.25	117
7	Nil	Amistar Xtra 400ml	5.70	106
8	Opus 250ml	Opus 250ml	6.06	113
9	Nil	Opus 250ml	5.60	104
		LSD(5%)	0.63	
		CV%	6.3%	
Significance of contrasts:				
	Fungicide (trts 2-9) vs Control		ns	
	Single vs double application (trts 2,4,6,8, vs 3,5,7,9)		ns	

Note: ns=not significant; *=5% sig; **=1% sig; ***=0.1% sig.

¹ Aberrant result

Table 39: Yields t/ha and (% Untreated Control) – Mean of 2 Treatments

Main effect of chemical (average of 2 treatments)	Yield t/ha	% control
Nil	5.37	100
Bumper 250ml	5.48	102
Folicur 145ml	5.59	104
Tilt/Amistar Xtra 250ml	5.98	111
Opus 250ml	5.83	109
LSD(5%)[Treatment vs Treatment]	0.44	
LSD(5%)[Untreated vs Treated]	0.55	

Only the Amistar Xtra and Opus treatments significantly out yielded the untreated control, with Amistar Xtra also significantly out yielding the Bumper treatments.

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