

Trial 3. HYC Wheat Disease Management x Variety (FAR VIC W23-04a-01)

Key Points:

- *Fungicide input was not cost effective when applied to Longford (AGF4818) and AGTW005 at the Victoria research site.*
- *As a result of stripe rust infection RGT Cesario gave significant yield and margin improvements when full fungicide protection (4 units of fungicide) was applied.*
- *Although yield increases were much smaller and not significant Stockade gave its highest yield and margin under a single flag leaf spray, however the dry spring protected this variety from severe Septoria tritici blotch (STB) infection which was present in the base at early stem elongation.*
- *Fungicide management and cultivar affected grain protein in this trial, but the only effects on test weight and screenings were due to variety.*
- *AGTW005 had the highest yields and grain protein overall but unfortunately after four years in HYC trials it is not being commercialised.*

Treatments:

Three red feed winter wheats Longford (AGF4818), RGT Cesario, AGTW005 and the white wheat Stockade (APW) were managed with three levels of fungicide, untreated, a single flag leaf spray and full protection.

- **Untreated.**
- **A single flag leaf spray (GS39) – 1 unit of fungicide** Revystar 150EC (mefentrifluconazole 100g/L, fluxapyroxad 50g/L) applied at 750mL/ha (75g ai/ha & 37.5g ai/ha).
- **Full protection - 4 units of fungicide** – flutriafol-coated MAP in furrow at sowing (500 g ai/L at 200 mL/ha), Prosaro 420 SC (prothioconazole 210g/L, tebuconazole 210g/L) applied at 300mL/ha (63g ai/ha of each ai) at GS31, Revystar 150EC (mefentrifluconazole 100g/L, fluxapyroxad 50g/L) applied at 750mL/ha (75g ai/ha & 37.5g ai/ha) at GS39 and Opus 125 SC (epoxiconazole 125g/L) applied at 500mL/ha (62.5 g ai/ha) at GS59 – 4 units of fungicide.

Table 1: List of varieties and treatments applied.

Trt	Description	Variety	GS00	GS31	GS39	GS59-61
1	Untreated	Stockade	----	----	----	----
2	Untreated	RGT Cesario	----	----	----	----
3	Untreated	AGTW005	----	----	----	----
4	Untreated	Longford	----	----	----	----
5	1 Fungicide Flag Leaf Approach	Stockade	----	----	Revystar 0.75 L/ha	----
6	1 Fungicide Flag Leaf Approach	RGT Cesario	----	----	Revystar 0.75 L/ha	----
7	1 Fungicide Flag Leaf Approach	AGTW005	----	----	Revystar 0.75 L/ha	----
8	1 Fungicide Flag Leaf Approach	Longford	----	----	Revystar 0.75 L/ha	----
9	4 Fungicides Full Protection	Stockade	Flutriafol 0.2 L/ha	Prosaro 0.3 L/ha	Revystar 0.75 L/ha	Opus 0.5 L/ha
10	4 Fungicides Full Protection	RGT Cesario	Flutriafol 0.2 L/ha	Prosaro 0.3 L/ha	Revystar 0.75 L/ha	Opus 0.5 L/ha
11	4 Fungicides Full Protection	AGTW005	Flutriafol 0.2 L/ha	Prosaro 0.3 L/ha	Revystar 0.75 L/ha	Opus 0.5 L/ha
12	4 Fungicides Full Protection	Longford	Flutriafol 0.2 L/ha	Prosaro 0.3 L/ha	Revystar 0.75 L/ha	Opus 0.5 L/ha

Table 2: Influence of management strategy and cultivar on grain yield (t/ha).

	Yield (t/ha)						
	Management Strategy						
	Untreated		1 Fungicide		4 Fungicides		Mean
Stockade	6.14	abc	6.48	abc	5.71	c	6.11 b
RGT Cesario	4.36	d	4.77	d	5.89	bc	5.00 c
AGTW005	6.82	a	6.40	abc	6.91	a	6.71 a
Longford	6.65	ab	6.19	abc	6.39	abc	6.41 ab
Mean	5.99	-	5.96	-	6.22	-	6.06
LSD Cultivar P=0.05			0.53		P value		<0.001
LSD Management P=0.05			ns		P value		0.060
LSD Cultivar x Man. P=0.05			0.93		P value		0.035

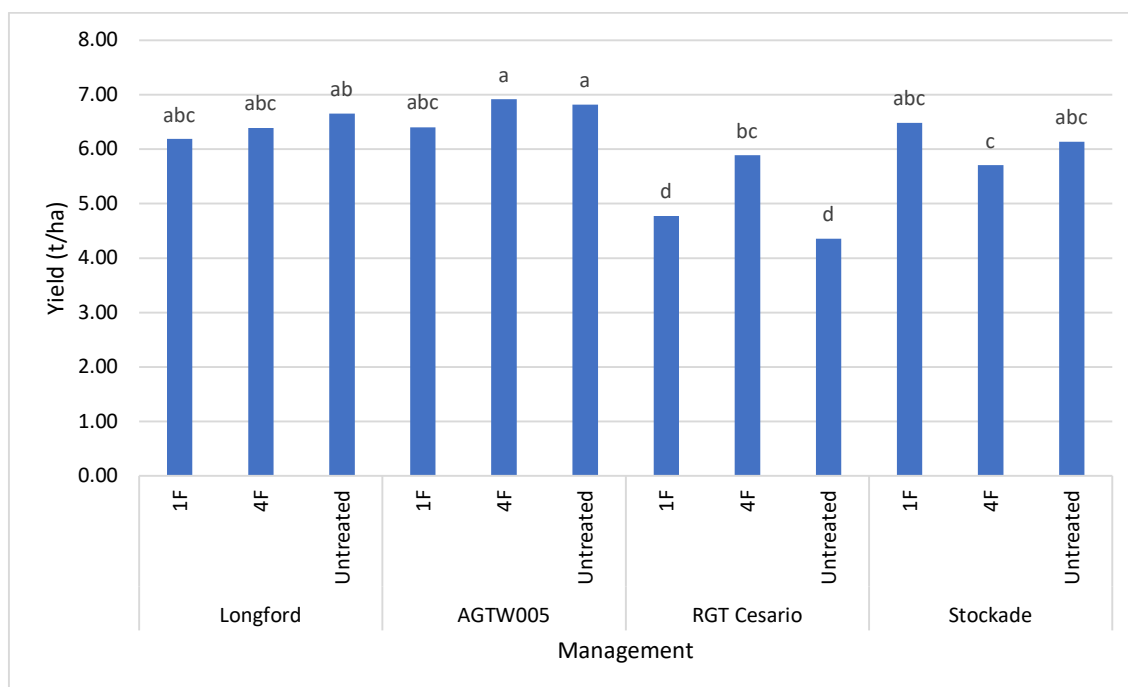


Figure 1. Interaction of cultivar and level of fungicide input on grain yield (t/ha) (P Value=0.035, LSD (P=0.05)= 0.93).

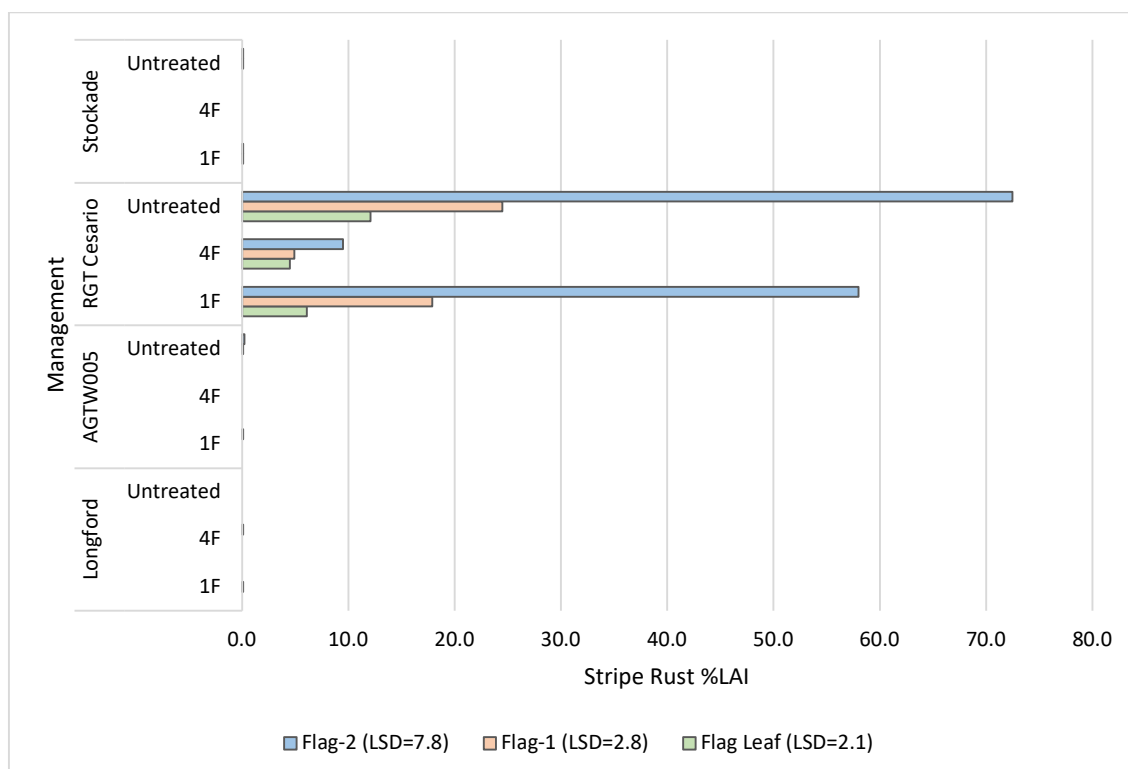


Figure 2. Influence of fungicide management strategy and cultivar on (%) Stripe Rust leaf area infection (LAI) on Flag, Flag-1 and Flag-2 assessed 3 November (GS71). Refer to Table 3 for significance.

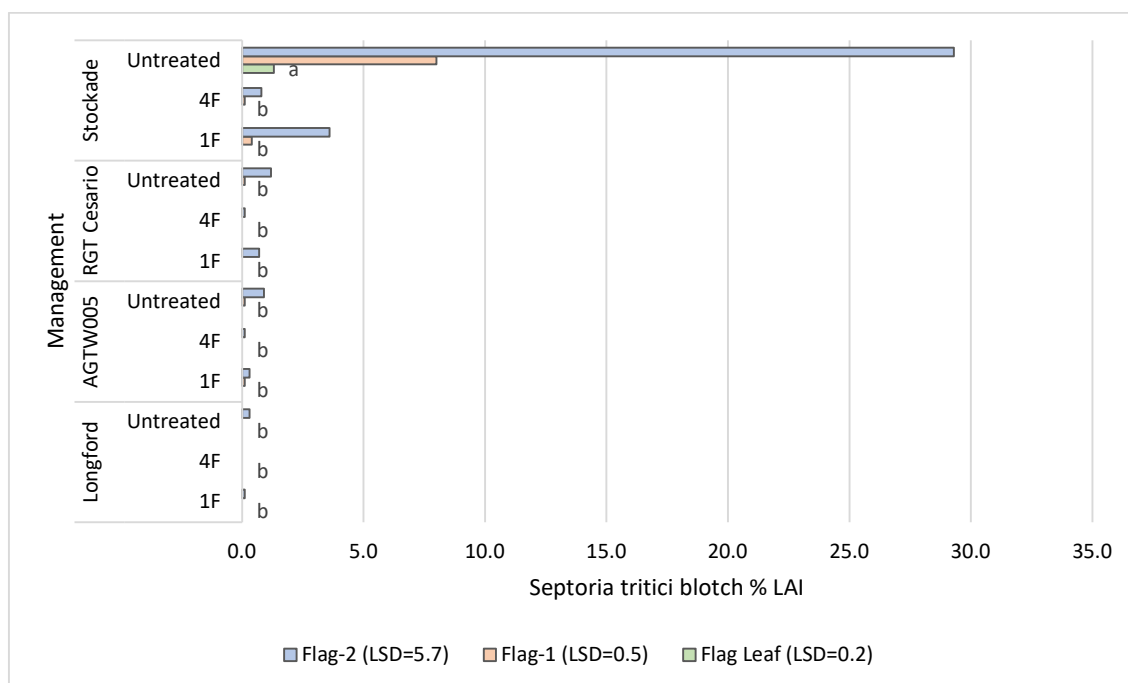


Figure 3. Influence of fungicide management strategy and cultivar on % STB leaf area infection (LAI) on Flag, Flag-1 and Flag-2 assessed 3 November (GS71). Refer to Table 2 for significance.

Table 3: Significance analysis of the influence of management strategy and cultivar on leaf area infection (%) of septoria tritici blotch (STB), stripe rust and, green leaf retention (See Figure 2 and 3).

			P Value	LSD P=0.05
Septoria tritici blotch	Flag	Cultivar	<0.001	0.1
		Management	0.001	0.1
		Cultivar x Man.	<0.001	0.2
	FL-1	Cultivar	<0.001	0.3
		Management	<0.001	0.3
		Cultivar x Man.	<0.001	0.5
	FL-2	Cultivar	<0.001	3.3
		Management	0.002	3.2
		Cultivar x Man.	<0.001	5.7
Stripe rust	Flag	Cultivar	<0.001	1.2
		Management	0.025	1.3
		Cultivar x Man.	<0.001	2.1
	FL-1	Cultivar	<0.001	1.6
		Management	<0.001	1.6
		Cultivar x Man.	<0.001	2.8
	FL-2	Cultivar	<0.001	4.5
		Management	<0.001	4.8
		Cultivar x Man.	<0.001	7.8
Green Leaf Retention	FL-3	Cultivar	<0.001	12.6
		Management	0.045	12.8
		Cultivar x Man	0.050	21.9

Grain protein was significantly influenced by both management and variety with fungicide application increasing grain protein compared to the untreated crop. The white wheat Stockade produced significantly lower protein than the three red wheats tested (Table 4). The variety also produced significantly lower test weights than two of the other varieties (Table 5).

Table 4: Influence of management strategy and cultivar on protein (%).

	Protein (%)			
	Management Strategy			
	Untreated	1 Fungicide	4 Fungicides	Mean
Stockade	11.0 -	11.0 -	11.2 -	11.1 b
RGT Cesario	11.3 -	11.7 -	12.1 -	11.7 a
AGTW005	12.0 -	12.0 -	12.0 -	12.0 a
Longford	11.8 -	12.2 -	11.9 -	12.0 a
Mean	11.5 b	11.7 a	11.8 a	11.7
LSD Cultivar P=0.05		0.4	P value	<0.001
LSD Management P=0.05		0.1	P value	<0.001
LSD Cultivar x Man. P=0.05		ns	P value	0.449

Note: 150 N kg/ha of applied nitrogen fertiliser as solid prilled 46% N urea

Table 5: Influence of management strategy and cultivar on test weight (kg/hL).

	Test weight (kg/hL)			
	Management Strategy			
	Untreated	1 Fungicide	4 Fungicides	Mean
Stockade	72.7 -	73.0 -	72.6 -	72.7 b
RGT Cesario	72.6 -	73.0 -	73.6 -	73.1 b
AGTW005	75.2 -	75.2 -	75.1 -	75.2 a
Longford	74.8 -	74.3 -	75.2 -	74.8 a
Mean	73.8 -	73.9 -	74.1 -	73.9
LSD Cultivar p = 0.05		0.7	P val	<0.001
LSD Management p = 0.05		ns	P val	0.695
LSD Cultivar x Man. P = 0.05		ns	P val	0.675

Table 6: Influence of management strategy and cultivar on screenings (%).

	Screenings (%)			
	Management Strategy			
	Untreated	1 Fungicide	4 Fungicides	Mean
Stockade	3.6 -	3.8 -	3.6 -	3.7 a
RGT Cesario	2.1 -	1.9 -	2.4 -	2.1 c
AGTW005	2.6 -	2.6 -	2.7 -	2.6 b
Longford	3.4 -	3.9 -	3.8 -	3.7 a
Mean	2.9 -	3.0 -	3.1 -	3.0
LSD Cultivar p = 0.05		0.5	P val	<0.001
LSD Management p = 0.05		ns	P val	0.434
LSD Cultivar x Man. P = 0.05		ns	P val	0.737

Table 7: Trial input and management details.

Varieties:		Longford, RGT Cesario, AGTW005 and Stockade	
Sowing date:		29 April 2023	
Harvest date:		16 January 2024	
Seed rate:		180 seeds/m ²	
Basal fertiliser:		29 Apr	100 kg/ha MAP
Nitrogen:		06 Jul	108.7 Kg/ha Urea (50 N/ha)
		28 Aug	217.4 Kg/ha Urea (100 N/ha)
Fungicides:		As per treatment list (refer to table 1)	

Table 8. Active ingredients and chemical loading (g/L) for products used.

Name	Active 1		Active 2		Type
Fungicide					
Flutriafol	Flutriafol	500 g/L	---	---	SC
Opus	Epoxiconazole	125 g/L	---	---	SC
Prosaro	Prothioconazole	210 g/L	Tebuconazole	210 g/L	SC
Revystar	Mefentrifluconazole	100 g/L	Fluxapyroxad	50 g/L	EC