

Trial 3. HYC Wheat Germplasm x Environment x Management (GEM) (FAR VIC W22-03-1)

Key Points:

- Grain yields in the Victoria GEM (April 28 sown) trial were low with excessive rainfall during October when the crop was flowering and grain filling.
- RGT Cesario was higher yielding than Big Red which in turn was higher yielding than RGT Accroc.
- Grain yields of RGT Accroc, RGT Cesario and Big Red were consistently higher yielding under a 3-spray full fungicide programme irrespective of a canopy management strategy, with RGT Cesario being the highest yielding cultivar.
- There was significant interaction between cultivar and fungicide strategy with RGT Accroc giving a greater response to the 2-spray fungicide (1.5 t/ha) than RGT Cesario (0.90 t/ha) and Big Red (0.61 t/ha) over the single spray fungicide approach at flag leaf.
- The highest yielding canopy management approach was 150kg N/ha with no specific intervention (defoliation, additional N and PGR) and the higher input fungicide strategy.
- Although additional N input (additional 75kg N/ha giving a total of 225kg N/ha clearly benefited from PGR application, the overall yield increase was not sufficiently large to pay for the additional input compared to the standard 150kg N/ha.
- When a higher fungicide programme was employed, it did not change the optimal canopy management approach in terms of economics, with all varieties giving their optimum economics when a higher input fungicide programme was incorporated with the standard 150kg N/ha and no canopy management.

Management treatments

Treatment ID	Fungicide*	Canopy Intervention	Kg Nitrogen (N)/ha
1. Standard (Std) Fungicide & no intervention (NI)	Standard (cheaper)	Untreated	150
2. Standard (Std) Fungicide & no intervention (NI) + N	Standard (cheaper)	Untreated	225
3. Standard (Std) Fungicide & PGR	Standard (cheaper)	Defoliation	225
4. Standard (Std) Fungicide & PGR + N	Standard (cheaper)	PGR	225
5. Higher input Fungicide & no intervention (NI)	Higher input	Untreated	150
6. Higher input Fungicide & PGR + N	Higher input	Untreated	225
7. Dual - purpose system	Higher input	Defoliation	225
8. Hyper - yield system	Higher input	PGR	225

Standard Fungicide – Foliar fungicides FAR F1/19 (DMI/SDHI mix) at GS39.

HYC high input fungicide – 2 x foliar fungicides including Prosaro GS31, FAR F1/19 GS39.

Treatments 3 & 4 - Plant growth regulators (PGR) (Moddus 0.1 + Errex 0.65 L/ha at GS30 and again at GS32)

Defoliation was done mechanically (mower) prior to the GS30.

Table 1. Influence of, management strategy and cultivar on grain yield (t/ha).

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		RGT Cesario		Big Red		RGT Accroc		Mean
Cultivar		7.15	a	6.66	b	5.34	c	6.38
	LSD	0.27				P-Value		<0.001
Disease Pressure								
	Single Spray Program	6.70	bc	6.35	cd	4.59	e	5.88 b
	Full Fungicide Program	7.60	a	6.96	b	6.09	d	6.88 a
Fungicide	LSD	0.36				P-Value		0.003
Fungicide x Cultivar	LSD	0.38				P-Value		0.006
Canopy Management								
	No Intervention - 150N	7.30	-	6.86	-	5.40	-	6.52 -
	No intervention – 225N	7.03	-	6.54	-	5.34	-	6.31 -
	Mechanical Defoliation GS30	7.06	-	6.46	-	5.20	-	6.24 -
	PGR Moddus 0.2 + Errex 1.3 GS30	7.20	-	6.76	-	5.42	-	6.46 -
Canopy Management	LSD	ns				P-Value		0.400
Cultivar x Canopy Mgmt	LSD	ns				P-Value		0.994
Fungicide Management x Canopy Mgmt.								
Single Spray Program								
	No Intervention - 150N	6.72	-	6.74	-	4.66	-	6.04 -
	No intervention – 225N	6.81	-	6.59	-	4.54	-	5.98 -
	Mechanical Defoliation GS30	6.71	-	5.79	-	4.86	-	5.78 -
	PGR Moddus 0.2 + Errex 1.3 GS30	6.55	-	6.30	-	4.30	-	5.72 -
Full Fungicide Program								
	No Intervention - 150N	7.89	-	6.97	-	6.15	-	7.00 -
	No intervention – 225N	7.26	-	6.50	-	6.14	-	6.63 -
	Mechanical Defoliation GS30	7.42	-	7.14	-	5.54	-	6.70 -
	PGR Moddus 0.2 + Errex 1.3 GS30	7.84	-	7.22	-	6.55	-	7.20 -
Fungicide Management x Canopy Mgmt.	LSD	ns				P-Value		0.173
Fungicide Management x Canopy Mgmt. x Cultivar	LSD	ns				P-Value		0.065

Table 2. Influence of management strategy and cultivar on screenings (%).

		RGT Cesario		Big Red		RGT Accroc		Mean
Cultivar		2.4	b	2.7	b	5.5	a	3.5
	LSD	0.61				P-Value		<0.001
Disease Pressure								
Single Spray Program		2.5	bc	2.8	bc	7.6	a	4.3 a
Full Fungicide Program		2.2	c	2.7	bc	3.3	b	2.7 b
Fungicide	LSD	0.30				P-Value		<0.001
Fungicide x Cultivar	LSD	0.86				P-Value		<0.001
Canopy Management								
No Intervention - 150N		2.1	-	2.5	-	5.1	-	3.3 -
No intervention – 225N		2.4	-	2.6	-	5.7	-	3.5 -
Mechanical Defoliation GS30		2.3	-	3.3	-	4.6	-	3.4 -
PGR Moddus 0.2 + Errex 1.3 GS30		2.6	-	2.5	-	6.6	-	3.9 -
Canopy Management	LSD	ns				P-Value		0.287
Cultivar x Canopy Mgmt	LSD	ns				P-Value		0.113
Fungicide Management x Canopy Mgmt.								
Single Spray Program								
No Intervention - 150N		2.3	-	2.3	-	6.8	-	3.8 -
No intervention – 225N		2.5	-	2.4	-	7.9	-	4.3 -
Mechanical Defoliation GS30		2.4	-	3.8	-	5.8	-	4.0 -
PGR Moddus 0.2 + Errex 1.3 GS30		2.8	-	2.6	-	9.9	-	5.1 -
Full Fungicide Program								
No Intervention - 150N		2.0	-	2.8	-	3.3	-	2.7 -
No intervention – 225N		2.3	-	2.8	-	3.4	-	2.8 -
Mechanical Defoliation GS30		2.2	-	2.7	-	3.4	-	2.8 -
PGR Moddus 0.2 + Errex 1.3 GS30		2.4	-	2.4	-	3.3	-	2.7 -
Fungicide Management x Canopy Mgmt.	LSD	ns				P-Value		0.256
Fungicide Management x Canopy Mgmt. x Cultivar	LSD	ns				P-Value		0.105

Table 3. Influence of management strategy and cultivar on harvest dry matter (t/ha).

		RGT Cesaio		Big Red		RGT Accroc		Mean
Cultivar		18.4	a	16.9	b	14.9	c	16.7
LSD		0.79				P-Value		<0.001
Disease Pressure								
Single Spray Program		17.5	-	16.5	-	13.5	-	15.8 b
Full Fungicide Program		19.3	-	17.4	-	16.3	-	17.7 a
Fungicide	LSD	0.68				P-Value		0.003
Fungicide x Cultivar	LSD	ns				P-Value		0.059
Canopy Management								
No Intervention - 150N		18.1	-	16.6	-	15.2	-	16.7 -
No intervention – 225N		19.5	-	18.0	-	14.5	-	17.3 -
Mechanical Defoliation GS30		18.4	-	16.7	-	14.2	-	16.4 -
PGR Moddus 0.2 + Errex 1.3 GS30		17.5	-	16.4	-	15.8	-	16.6 -
Canopy Management	LSD	ns				P-Value		0.371
Cultivar x Canopy Mgmt	LSD	ns				P-Value		0.068
Fungicide Management x Canopy Mgmt.								
Single Spray Program								
No Intervention - 150N		15.8	-	16.5	-	13.4	-	15.2 -
No intervention – 225N		19.2	-	17.7	-	13.5	-	16.8 -
Mechanical Defoliation GS30		17.8	-	15.7	-	13.5	-	15.6 -
PGR Moddus 0.2 + Errex 1.3 GS30		17.3	-	16.0	-	13.5	-	15.6 -
Full Fungicide Program								
No Intervention - 150N		20.5	-	16.7	-	17.0	-	18.1 -
No intervention – 225N		19.8	-	18.4	-	15.4	-	17.9 -
Mechanical Defoliation GS30		19.1	-	17.7	-	14.8	-	17.2 -
PGR Moddus 0.2 + Errex 1.3 GS30		17.7	-	16.7	-	18.1	-	17.5 -
Fungicide Management x Canopy Mgmt.	LSD	ns				P-Value		0.423
Fungicide Management x Canopy Mgmt. x Cultivar	LSD	ns				P-Value		0.074

Table 4. Details of the management levels.

Sowing date:		28 April
Plant population:		180 seeds/m ²
Basal fertiliser:		100 kg/ha MAP
Nitrogen:	13 July	50kg N/ha
	2 Sept	+ 25kg N/ha
	5 Sept	100kg N/ha
	27 Sept	+50kg N/ha
Fungicide:	GS00	Systiva
	GS31	Opus 500ml/ha
	GS39	Radial 840ml/ha