



## Wheat Germplasm x Fungicide Interaction – Time of Sowing 1 (April 5)

### 2018 Yield Results (t/ha) (*Provisional*)

Sown: 5 April 2018

Harvested: 30 January 2019

Rotation position: 1<sup>st</sup> Wheat after Chickpeas

**Table 1.** Grain yield (t/ha) of 10 cultivars under plus and minus fungicide protection

Cultivar	Fungicide Management		Response to Fungicide	
	Full Protection	Nil (untreated)	t/ha	%
RGT Accroc	12.49 ab	9.94 def	2.55	26
Annapurna	12.18 abc	10.29 de	1.89	18
RGT Calabro	12.60 a	9.45 fg	3.15	33
RGT Relay	9.67 ef	6.87 ij	2.80	41
DS Bennett	10.40 d	5.88 kl	4.52	77
Conqueror	10.38 d	6.68 ij	3.70	55
Genius	11.53 c	8.78 gh	2.75	31
Kittyhawk	6.52 jk	5.68 l	0.84	15
Manning	11.83 bc	8.21 h	3.62	44
SFR 86-044	8.21 h	7.23 i	0.98	14
<b>Mean</b>	<b>10.58</b>	<b>7.90</b>		
<b>LSD Cultivar p = 0.05</b>		0.48 t/ha	<b>P val</b>	<0.001
<b>LSD Management p=0.05</b>		0.41 t/ha	<b>P val</b>	<0.001
<b>LSD Cultivar x Fungicide. P=0.05</b>		0.68 t/ha	<b>P val</b>	<0.001

**Please read the notes accompanying these express results for interpretation**

Figures followed by different letters are considered to be statistically different ( $p=0.05$ ), for example a yield of 12.49 ab is considered statistically different to 9.67 ef but is considered to be statistically the same as a yield of 12.18 abc.

All varieties are covered under variety license agreements.

\*SFR 86-044 subject to poor germination and establishment so yield should be treated with caution.

The principal diseases were Septoria tritici blotch and leaf rust caused by the pathogens *Zymoseptoria tritici* and *Puccinia triticina* which were present at high levels in the trial.

When grain yield was considered there was a statistically significant interaction ( $p<0.001$ ) between cultivar and fungicide management indicating that cultivars responded differently to full fungicide protection. DS Bennett and Conqueror were the most responsive to full fungicide protection and Kittyhawk and Annapurna the least responsive (Table 1). There was also a significant interaction ( $p=0.012$ ) between variety and fungicide management affecting test weight and screenings, indicating that less fungicide responsive cultivars such as Annapurna and Kittyhawk produced smaller differences



in test weights between plus and minus fungicide compared to cultivars such as Genius, Conqueror and DS Bennett which gave greater increases in test weight as a result of fungicide protection. Annapurna and Kittyhawk returned the highest test weights irrespective of management (Table 2).

**Table 2.** Influence of treatment on grain quality (protein (%), test weight (kg/hL) and screenings (%)).

Cultivar	Protein				Test Weight				Screening			
	Full Protection		Nil (untreated)		Full Protection		Nil (untreated)		Full Protection		Nil (untreated)	
	%		%		Kg/hl		Kg/hl		%		%	
RGT Accroc	12.0	ab	8.1	b	80.6	ab	78.3	c-f	1.2	g	2.1	efg
Annapurna	12.5	a	9.7	ab	81.1	ab	81.2	ab	3.1	a-g	2.8	c-g
RGT Calabro	9.3	ab	10.6	ab	79.5	bcd	76.5	fgh	2.9	c-g	2.6	c-g
RGT Relay	8.9	ab	11.9	ab	73.6	jk	71.8	k	4.8	ab	4.0	a-e
DS Bennett	11.0	ab	11.3	ab	80.3	abc	77.0	fgh	2.9	b-g	2.4	d-g
Conqueror	10.9	ab	11.2	ab	74.1	ij	68.9	l	4.4	abc	4.0	a-e
Genius	10.9	ab	10.8	ab	79.3	b-e	75.5	hij	1.7	fg	2.9	b-g
Kittyhawk	12.6	a	12.4	a	82.0	a	81.1	ab	1.7	fg	2.3	d-g
Manning	10.8	ab	10.9	ab	79.9	abc	76.2	ghi	3.4	a-f	4.2	a-d
SFR 86-044	12.0	ab	12.3	a	77.9	d-g	77.3	e-h	4.0	a-e	5.0	a
<b>Mean</b>	<b>11.1</b>	<b>a</b>	<b>10.9</b>	<b>a</b>	<b>78.8</b>	<b>a</b>	<b>76.4</b>	<b>b</b>	<b>3.0</b>	<b>a</b>	<b>3.2</b>	<b>a</b>
LSD Fung. p=0.05	3.0				1.4				1.6			
LSD Cultivar p = 0.05	2.8				1.5				1.4			
LSD Cult. x Fung. P=0.05	4.0				2.1				2.0			
P val Fung	0.874				0.010				0.693			
P val Cultivar	0.725				<0.001				<0.001			
P val Cult. x Fung.	0.507				0.012				0.773			

Figures followed by different letters are considered to be statistically different (p=0.05)

**Table 3.** Margin (\$/ha) after fungicide and application costs (fungicide cost based on \$95/ha and application cost based on \$45/ha) have been deducted from the value of additional yield at \$350/t.

Cultivar	Response to Fungicide t/ha	Extra income from fungicide @\$350/t	Margin after input cost and application \$/ha	Return on Investment \$ back for every \$1 spent
RGT Accroc	2.55	893	753	6.4
Annapurna	1.89	662	522	4.7
RGT Calabro	3.15	1103	963	7.9
RGT Relay	2.80	980	840	7.0
DS Bennett	4.52	1582	1442	11.3
Conqueror	3.70	1295	1155	9.3
Genius	2.75	963	823	6.9
Kittyhawk	0.84	294	154	2.1
Manning	3.62	1267	1127	9.1
SFR 86-044	0.98	343	203	2.5
<b>Mean</b>	<b>2.68</b>	<b>938</b>	<b>798</b>	<b>6.7</b>



**Table 4.** Detail of management levels applied

<b>Sowing date:</b>	<b>5-April</b>	
<b>Seed Rate:</b>	180 seeds/m <sup>2</sup>	
<b>Sowing Fertiliser:</b>	100kg MAP	
<b>Seed Treatment</b>	Pontiac	
<b>Management:</b>	<b>Untreated</b>	<b>Total Protection</b>
<b>Fungicide:</b>	GS00	---
	GS31	---
	GS39	---
	GS61	---
		Systiva
		Opus 500ml/ha
		Radial 840ml/ha
		Prosaro 300ml/ha
	<b>Overall Inputs</b>	
<b>Nitrogen:</b>	8- Aug	60 kg N/ha
	29- Aug	92kg N/ha
	14-Sep	92kg N/ha
<b>PGR:</b>	14-Aug	Moddus Evo 200ml/ha & Errex 1300ml/ha
	4-Sep	Moddus Evo 200ml/ha
<b>Insecticide:</b>	24-May	Karate Zeon 40ml/ha
	7-Jan	Ambush 200ml/ha
<b>Trace elements:</b>	24-May	Kontrace 8 3000ml/ha
<b>Irrigation:</b>	28-Sep	10mm
	17-Oct	25mm
	1-Nov	25mm

**Notes:**

- Sown in early April, all cultivars responded positively to fungicide protection, giving yield increases between 0.84 - 4.52t/ha (14 - 77%).
- Earlier spring development in the short season winter wheat Kittyhawk resulted in significant frost damage from early April sowing.
- Of the three highest yielding cultivars RGT Accroc, RGT Calabro and Annapurna it was the RGT lines that were more responsive to fungicides, although all three gave good return on investment (\$ returned for \$ spent) (Table 3).
- Kittyhawk's response to fungicide was the smallest (return on investment 2:1) i.e. for every \$ spent two were returned, compared to 11:1 with DS Bennett.
- RGT Relay and Conqueror which have performed strongly in previous seasons sown in early April produced very low thousand seed weights which were associated with a high proportion of erect heads at harvest.



**Image 1.** 15 November 2018, location of trial within the Hyper Yielding Cereals research site.