LSD Dis. press.x cultivar x fung. p=0.05	ns	**P val**	0.995

Table 3. Details of the management levels (kg, g, ml/ha).

Sowing date:		**29 April**				
Seed Rate:		180 Seeds/m2				
Sowing Fertiliser:		100kg MAP				
Seed Treatment:		Vibrance & Goucho				
Grazing:		Nil				
Nitrogen:	10 Aug	46kg N/ha				
	1 Oct	160kg N/ha				
PGR:	GS30	Moddus Evo 100ml/ha + Errex 650ml/ha				
	GS32	Moddus Evo 100ml/ha + Errex 650ml/ha				
		Untreated	**1 Fungicide Unit**	**4 Fungicide Units**	**IDM approach**	**Straddle approach**
Fungicide:	GS00	---	---	Systiva	---	---
	GS31	---	---	Prosaro 300ml/ha	Prosaro 300ml/ha	---
	GS33	---	---	---	---	FAR F1-19 750ml/ha
	GS39	---	FAR F1-19 750ml/ha	FAR F1-19 750ml/ha	FAR F1-19 750ml/ha	---
	GS55	---	---	---	---	Opus 500ml/ha
	GS59-61	---	---	Opus 500ml/ha	---	---

Trial 5: Nutrition for Hyper Yielding Wheat

Objectives: To assess the value of higher nutrition input (N, P, K & S) for wheat in the growing season and as an "N bank" for the following season.

Individual objectives specific to the trials were:

- To assess the value of additional nutrients in the growing crop (set up as small plots at the HYC Research sites) and for the following crop (mirror image trial set up in the host farmer's surrounding paddock).
- To assess the value of adding increased P, K, and S when targeting higher yield potential rather than N alone.

Key Messages:

- There was a significant response to N application in the trial with a 2.41t/ha yield increase associated with a 200kg N/ha application applied in three splits.
- 200kg N/ha produced a crop canopy of 23t/ha dry matter
- There was no significant increase in yield over and above 200N or from the application of additional P and S, although grain protein continued to increase up to 291N the highest rate of nitrogen fertiliser applied.

- The unfertilised crop (100 MAP only at sowing) resulted in a 9.37t/ha crop and 8.9% grain protein.
- Based on the N concentration in the grain the N offtake in the grain alone was approximately 146kg N/ha. If 25% of the N typically resides in the straw and chaff at harvest, then crop uptake in the unfertilised plot was approximately 195kg N/ha.
- On this basis of soil N available in May (103N) and 10N from the MAP it would indicate 82kg N/ha from mineralisation.
- Increasing grain protein did not increase crop canopy size beyond 23.8t/ha dry matter at harvest. Application of 291N produced significantly lower yields than 204N and 252N applied.
- Although grain protein increased with higher N fertiliser input screenings gradually increased with test weight and thousand seed weight showing a decreasing trend.

Treatments: Five different nutrition strategies were put in place in RGT Accroc that differed in the level of nutrition (N, P & S). The same trial was set up in the surrounding farm crop. The starting mineral nitrogen (N) available in the soil was 130.9kg N/ha (0-60cm) taken on 21 May.

Table 1. Detailed treatment list, grain yield (t/ha) & % site Mean.

Trt.		Nitrogen rate	Potassium rate	Sulphur rate	Yield		Mean
		kg N/ha	kg K/ha	kg S/ha	(t/ha)		(%)
1	Untreated	10.0 (MAP)	---	---	9.37	c	85.3
2	Current Practice	204.0	---	---	11.78	a	107.3
3	Current Practice +25%N	252.5	---	---	11.45	a	104.2
4	Current Practice +50% NPKS	252.5	41.6	17.2	11.52	a	104.9
5	Current Practice +50%N	291.0	---	---	10.80	b	98.3
				Mean	10.98		100.0
				LSD (p=0.05)	0.63		5.8
				P Val	<0.001		<0.001

Note: All treatments received 100kg/ha MAP (10N: 22P) which is included in the treatment details

Table 2. Influence of nitrogen rate on grain quality, protein (%), test weight (kg/HL) and screenings (%).

	Nitrogen rate	Phosphorus rate	Sulphur rate	Protein		Test weight		Screenings	
Trt.	**kg N/ha**	**kg P/ha**	**kg S/ha**	**(%)**		**(kg/HL)**		**(%)**	
1	10.0	---	---	8.9	d	75.7	-	3.1	b
2	204.0	---	---	11.4	c	74.4	-	4.1	ab
3	252.5	---	---	11.8	bc	75.0	-	4.2	ab
4	252.5	41.6	17.2	12.6	ab	72.2	-	4.3	ab
5	291.0	---	---	12.7	a	70.4	-	5.2	a
			Mean	11.5		73.5		4.2	
			LSD (p=0.05)	0.9		ns		1.2	
			P Val	<0.001		0.172		0.041	

Table 3. Influence of nitrogen rate on harvest dry matter (t/ha), head (m^2).

	Nitrogen rate	Phosphorus rate	Sulphur rate	Harvest Dry Matter	Harvest Index	TSW
Trt.	**kg N/ha**	**kg P/ha**	**kg S/ha**	**(t/ha)**	**%**	**g**
1	10.0	---	---	18.2 b	45.6 -	50.6 a
2	204.0	---	---	23.8 a	44.2 -	42.2 b
3	252.5	---	---	23.6 a	42.9 -	40.9 b
4	252.5	41.6	17.2	23.2 a	43.6 -	40.8 b
5	291.0	---	---	23.6 a	40.8 -	38.7 b
			Mean	22.5	43.4	42.6
			LSD (p=0.05)	2.4	ns	5.2
			P Val	0.001	0.443	0.003

Table 4. Site soil test details.

	Level Found
ECEC	0.12 dS/m
Organic Carbon W&B	2.24%
pH 1:5 water	6.57pH
Total Mineral N*	130.9kg soil mineral N/ha
Colwell Phosphorus	210.2 ppm
Colwell Potassium	281.3 ppm
KCl Sulfur	11.9 ppm

*Mineral N 0-60cm, all other results 0-10cm depth sampled 11/6/2020

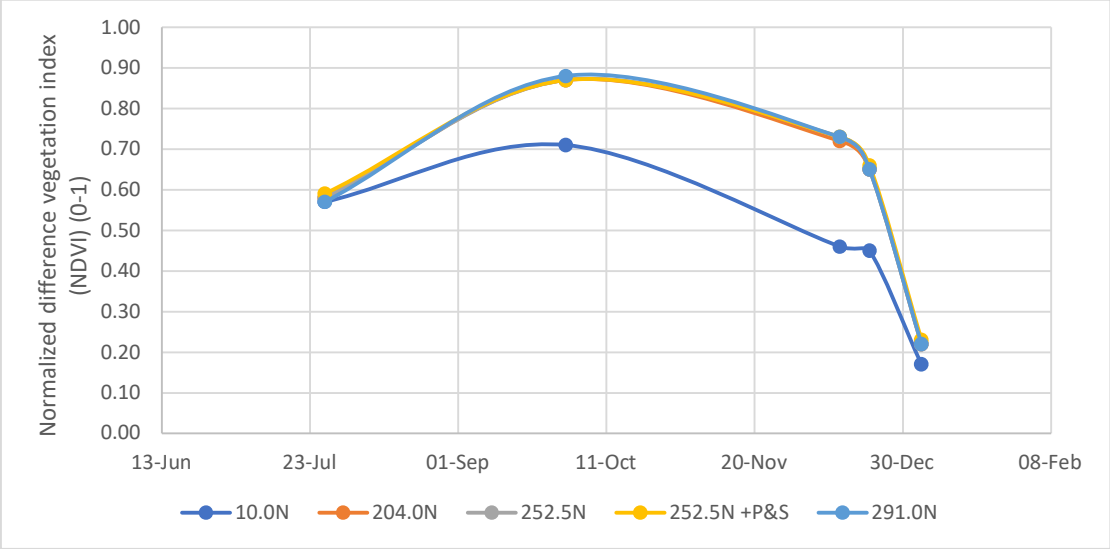

Figure 1. Normalised difference vegetation index (NDVI) (0-1) of RGT Relay nitrogen rates showing the strong visual differences observed in season between treated and untreated plots.

Table 5. Details of the management levels (kg, g, ml/ha).

Sowing date:		**29 April**
Seed Rate:		180 seeds/m2
Sowing Fertiliser:		100kg MAP
Seed Treatment:		Vibrance & Goucho

Grazing:		Nil
Nitrogen:		As per treatment list
PGR:	GS30	Moddus Evo 100ml/ha + Errex 650ml/ha
	GS32	Moddus Evo 100ml/ha + Errex 650ml/ha
Fungicide:	GS31	Opus 500ml/ha
	GS39	Radial 840ml/ha
	GS61	Prosaro 300ml/ha

Trial 6: Erect Head Control in April Sown Wheat

Objectives:
To assess the principal causes of erect heads in April sown wheat crops
Individual objectives specific to the trial were:

- To determine the value of Barley Yellow Dwarf Virus (BYDV) tolerance in HRZ wheat crops using a tolerant (cv Manning) and a non-tolerant (cv Revenue) cultivar.
- To assess the connection between erect heads and stem base disease complex e.g. crown rot, eyespot, sharp eyespot in the presence of different stem base fungicide applications.

Key Messages:

- *No BYDV was observed in the trial and as a result there were no significant yield differences due to BYDV control recorded in either Manning (tolerant) or Revenue (non BYDV tolerant) cultivars.*
- *Omitting the GS31 fungicide however (treatment 7 & 8) had a significant impact on grain yield with both Manning (minus 2.13t/ha) and Revenue (minus 2.34t/ha).*
- *Adding azoxystrobin to the first fungicide application at GS31 over and above the experimental fungicide increased yield with Manning but not with Revenue.*
- *The additional application of Dominex Duo along with the experimental fungicide (as opposed to Opus 250mL/ha) at GS31 significantly increased the yield of the non BYDV tolerant cultivar Revenue but the yield of Manning was unaffected.*
- *The "Revenue BYDV tolerant bred line" with no insecticide input was the highest yielding treatment of Revenue and not significantly different from the best Manning treatment that received azoxystrobin at GS31.*

Treatments:
Six different treatments applying four different levels of insecticide input for aphid (BYDV) control were applied to a tolerant (cv Manning) and a non-tolerant variety (cv Revenue). Two additional experimental treatments were applied that examined the value of an experimental fungicide applied at GS31, applied with and without the strobilurin azoxystrobin. Please note these treatments were applied to examine stem base disease control in this trial and are not commercially available treatments.