Trial 4. HYC Spring Wheat "Reset" Trial

Objectives: To assess the value of pre and post GS30 defoliation in winter and spring germplasm grown in HRZ or high yielding regions of different season lengths.

Individual objectives specific to the trial were:

- Assess the dry matter offtake differences resulting from GS22, GS30 & GS32 defoliations and their effect on final harvest dry matter, grain yield and harvest index of spring versus winter wheat.
- Assess whether April sown spring wheat that has been "reset at GS32 (defoliated)" is higher yielding than GS30 and GS22 grazed and ungrazed crops.
- To assess whether the dry matter offtakes of longer season winter wheats at GS22 are more profitable (dry matter offtake and grain yield) than the same winter wheat defoliated at GS30.

Key Points:

- *All defoliation treatments applied post GS30 reduced grain yield relative to the ungrazed and crops grazed at GS30.*
- *Although shorter grazing (hard grazing) produced more dry matter and gave slightly larger reductions in grain yield than light grazing, the differences were not statistically significant.*
- *With later grazing dates, due to a longer vegetative period, dry matter offtakes were significantly greater with RGT Accroc than with Trojan.*
- *The concept of "resetting Trojan" at GS32 was unsuccessful in terms of grain yield with a 22 April sown crop in the absence of any frost events.*
- *The development stage of grazing and degree of grazing (hard or light) were well correlated to preventing crop lodging due to reduced crop height and in some cases significantly less harvest dry matter.*
- *Unless the crop was reset with defoliation post GS30 at GS32 there was little noticeable difference in flowering date, although as would be expected RGT Accroc flowered later than Trojan.*

Treatments:
A winter and spring wheat (RGT Accroc and Trojan) were hard grazed and light grazed at start of stem elongation at GS30, grazed post stem elongation at second node (GS32) and left ungrazed. Defoliation was carried out with a lawn mower set at different heights at the two development stages (table 1).

Table 1. Defoliation timings and growth stages.

	Trojan		**RGT Accroc**	
	Date	Growth Stage	Date	Growth Stage
Light & Hard graze	17-June	GS 30	29-July	GS29
Late graze	29-July	GS 32	10-September	GS33

The concept of "resetting" is specifically designed for early sowing spring wheat that develops too quickly from earlier sowing than would be recommended, in this case mid-late April. The idea is that defoliation later than GS31 specifically removes advanced main stems that would have been frosted due to their very early development. Please note this is an experimental approach and should not yet be applied to commercial acreage.

Table 2. Influence of grazing management and variety on wheat grain yield (t/ha).

	Yield (t/ha)		
	Trojan	**Accroc**	**Mean**
Ungrazed	7.82 b	10.58 a	9.20 a
Hard Graze	7.46 b	10.22 a	8.84 a
Light Graze	7.85 b	10.38 a	9.12 a
Late (GS32) graze	4.66 d	6.05 c	5.36 b
Mean	6.95 b	9.31 a	
LSD Variety p=0.05	0.41	P val	**<0.001**
LSD Defoliation p=0.05	0.50	P val	**<0.001**
LSD Var x Defoliation p=0.05	0.71	P val	**0.03**

Table 3. Grazing dates and grazing strategy dry matter (t/ha) removal and harvest dry matter.

	Date	**GS 30**	**GS32**	**Harvest**
		Dry Matter (t/ha)	Dry Matter (t/ha)	Dry Matter (t/ha)
Trojan; untreated	---	---	---	20.96 a
Trojan; Hard graze	17-Jun	0.28 bc	---	19.95 a
Trojan; Light graze	17-Jun	0.19 c	---	18.72 a
Trojan GS32 graze	29-Jul	---	1.67 b	12.13 b
RGT Accroc; Untreated	---	---	---	20.23 a
RGT Accroc; Hard graze	29-Jul	0.58 a	---	20.22 a
RGT Accroc; Light graze	29-Jul	0.43 ab	---	19.87 a
RGT Accroc; GS32 graze	10-Sep	---	4.78 a	12.46 b
Mean		0.37	3.225	18.0675
LSD p=0.05		0.174	1.335	3.573
P val		**0.0031**	**0.0051**	**0.0001**

Table 4. Influence of grazing management on crop lodging (scale 0-500) at 3 points in the growing season and final crop height (cm) at harvest – Mean of two cultivars.

	Crop Lodging (0-500)			Crop Height (cm)
	27 Oct	18 Nov	7 Dec	7 Dec
Ungrazed	53.1 a	48.1 a	78.1 a	93.3 a
Hard Graze	10 b	4.7 b	17.5 bc	87.4 b
Light Graze	11.9 b	14.7 b	32.5 b	88.3 ab
Late (GS32) graze	0 b	0 b	0 c	74.4 c
Mean	18.75	16.875	32.025	85.85
LSD p=0.05	31.27	22.91	21.2	6.66
P Value	0.033	0.018	0.002	0.027

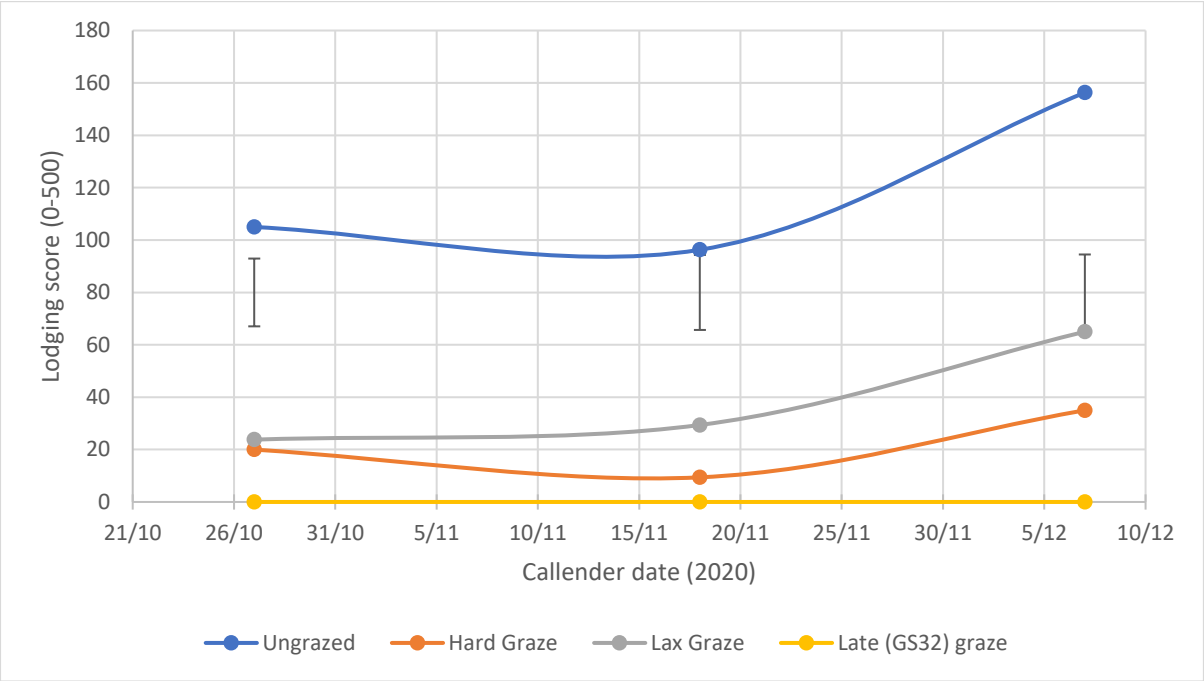


Figure 1. Influence of grazing management on Trojan during the growing season. Error bars represent LSD (p=0.05) of 25.9, 28.6, and 29.0 for 27/10, 18/11, and 7/12 respectively. P value =<0.001 at all dates.

Table 5. Influence of gazing management and variety on wheat phenology (development). Dates are approximate of critical growth stages.

	Sown	GS30	GS39	GS51	GS60	GS65
Trojan						
Untreated	21-Apr	17-Jun	28-Aug	17-Sep	23-Sep	27-Sep
Hard graze	21-Apr	17-Jun	6-Sep	19-Sep	25-Sep	29-Sep
Light graze	21-Apr	17-Jun	1-Sep	18-Sep	14-Sep	27-Sep
Late graze (GS32)	21-Apr	17-Jun	16-Sep	22-Sep	7-Oct	15-Oct
RGT Accroc						
Untreated	21-Apr	29-Jul	16-Sep	1-Oct	14-Oct	20-Oct
Hard graze	21-Apr	29-Jul	19-Sep	3-Oct	13-Oct	18-Oct
Light graze	21-Apr	29-Jul	22-Sep	6-Oct	15-Oct	20-Oct
Late graze (GS32)	21-Apr	29-Jul	5-Oct	17-Oct	27-Oct	5-Nov

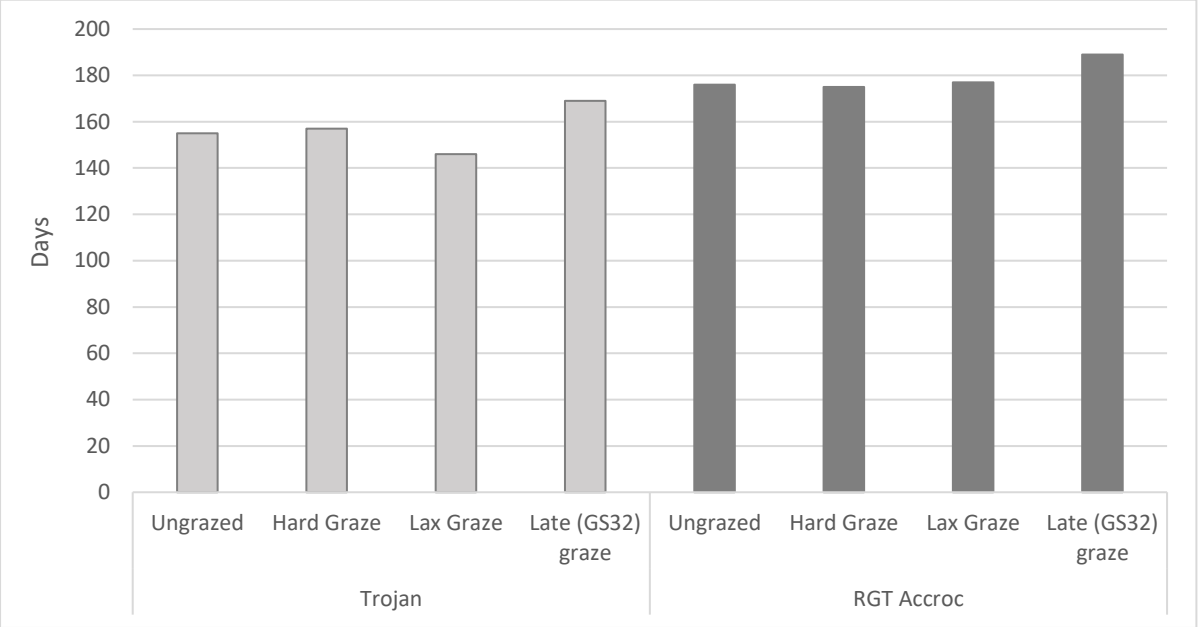


Figure 2. Approximate time taken (days) to reach critical growth period of flowering (GS 60).

Table 5. Details of the management levels applied (ml/ha).

Plant pop'n:		180 seeds/m^2 (150 plants/m2 target) - all management levels			
	Timing	**Ungrazed**	**Light Graze**	**Hard Graze**	**Late (GS32) Graze**
Seed trt:		Vibrance/Gaucho			
Basal Fertiliser:	21 April	120kg MAP (12 Kg N)			
Nitrogen:	18 June	40kg N/ha			
	23 July	70kg N/ha			
Total N Applied:		**122kg N/ha**			
PGR:		---	---	---	---
Grazing:**		---	GS30	GS30	GS32
Fungicide:*	GS31	Opus 500ml	Opus 500ml	Opus 500ml	Opus 500ml
	GS39	Amistar Xra 800ml	Amistar Xra 800ml	Amistar Xra 800ml	Amistar Xra 800ml
	GS59-61***	Prosaro 300ml	Prosaro 300ml	Prosaro 300ml	Prosaro 300ml

All other inputs of insecticides and herbicides were standard across the trial.

**Timings of fungicides were adjusted to take account of the differences in spring and winter wheat phenology (development).*

*** Grazing height varied to suit treatment.*

****Applied to Trojan only.*