Grain & Graze demonstration, Nullawil

Damian Jones *(DPI Kerang) and* ***Alison Frischke*** *(BCG)*

Take home messages

- *Early dry matter production (forage value) was boosted by earlier sowing.*
- *Grazing had significant effect on Hindmarsh barley but limited effects on Correll wheat performance in this 2010 demonstration.*
- *Moby (or forage cereals in general) offer more flexibility for grazing than the traditional cereals, as the plant recovery after grazing after Z30 is far greater.*

Background

Grazing cereal crops early in the season can complement grazing enterprises by providing extra feed in winter when legume pastures are slow growing. Grazing cereal trials have shown mixed effects on grain yields, and in some cases grain quality. If grazing does negatively impact on grain production, farmers need to be able to compare the value of the grazing with that of the lost value from reduced grain income.

Added to the grain and graze complexity is the increasing range of varieties of cereals bred specifically for grazing, often with claims of superior growth rates and recovery over the traditional grain types.

The Nullawil Best Wool Best Lamb group established a demonstration to evaluate a forage barley, with support from MLA and Northern Victoria Grain & Graze.

Aim

The demonstration aimed to compare the dry matter production available for forage and plant recovery after grazing of the forage barley variety Moby with that of Hindmarsh barley and Correll wheat.

Method

Location:	Nullawil
Sowing date:	17 April 2010, resown on 27 May 2010
Seeding density:	40 kg/ha
Crop types:	Moby forage barley, Hindmarsh barley and Correll wheat
Seeding equipment:	Farmer machinery, 35 cm row spacing

On 17 April majority of the paddock was sown with Moby barley, with the remaining area sown to a sowing width each of Hindmarsh barley and Correll wheat. Due to locust damage, all but one strip of Moby was resown on 27 May. The 37.5ha area sown was divided into three triangular sections, all of which had access to the same trough in the centre. In order to measure any effects from grazing, exclusion areas were fenced off to protect the crop in the section containing the Hindmarsh barley and Correll wheat strips.

Time of grazing was determined when the co-operator was satisfied that there was sufficient feed in the paddock. Prior to grazing the section containing the exclusion areas, dry matter assessments were conducted by cutting the cereals at ground level (19 July, 6 August and 21 October). The crops had 332 2nd cross prime lambs introduced initially. Due to the large amount of feed available, another 540 lambing ewes, with 232 lambs at foot at the time, were added to the paddock grazing rotation; the prime lamb mob grazed each section first, then when they were shifted to the next section, the ewes and lambs were moved into the same section to graze it down further. The two mobs rotated between sections every 10 – 12 days, covering the 37.5ha every 20 days.

The Hindmarsh barley and Correll wheat were grazed twice before reaching the Z31 stage in August; the stage at which further grazing would have damaged the plant's growing capacity. Moby continued to be grazed until October (Table 1).

Table 1. Nullawil Grazing Cereal Demonstration Treatments, 2010

Treatment	Variety and Sowing Date	Grazing Period
1.	Moby Barley, April sown	Rotationally grazed until October
2.	Moby Barley, May sown	Rotationally grazed until October
3.	Hindmarsh Barley, May sown	Rotationally grazed until Z31 (Aug 6)
4.	Correl Wheat, May Sown	Rotationally grazed until Z31 (Aug 6)

Results

At 12 weeks after sowing (19 July) April sown Moby had twice the dry matter of later sown Moby, Hindmarsh and Correll, sown nearly 6 weeks later (Table 2). This was maintained for another 18 days (6 August). Grazed Moby and Hindmarsh managed to recover within 20 days after grazing, while Correll was slower.

Table 2. Dry Matter Assessments (t/ha)

Time of Grazing	19 July	6 August		21 October	
Treatment	**Ungrazed**	**Ungrazed**	**Grazed**	**Ungrazed**	**Grazed**
1. Moby April	0.31	0.70	0.26	8.72	7.10
2. Moby May	0.12	0.34	0.14	6.64	5.87
3. Hindmarsh May	0.17	0.41	0.14	-	-
4. Correll May	0.12	0.19	0.07	-	-

After grazing in July rain fell almost weekly (except for a four week spell from 11 September to 6 October) for the next five months, ensuring good soil moisture and conditions for plant recovery. Moby barley was able to capitalise on this, recovering and producing, after being grazed twice, 7.1 and 5.9 t/ha of dry matter for April and May sown Moby respectively by 21 October (Table 2) - a respectable amount of feed!

Grain yield and quality responses to grazing for Hindmarsh and Correll varied (Table 3). Hindmarsh suffered a 1.1t/ha yield decline while Correll only 0.2 t/ha. This could have been due to the fact that Correll produced less dry matter in the first place, therefore would have had less dry matter consumed and the plant did not have to recover as much as did Hindmarsh compared with ungrazed crop. Another possibility is differences in grazing preference across varieties.

Table 3: Grain Yields and Quality

	Hindmarsh		Correll wheat	
	Ungrazed	**Grazed**	**Ungrazed**	**Grazed**
Grain yield (t/ha)	3.33	2.23	3.33	3.01
Retention (B)/ Screenings (W) (%)	92.5	93.1	1.0	2.3
Protein (%)	11.3	12.2	12.1	11.8
Test weight (kg/hL)	72.0	75.0	9.5	75.0

Grain quality for Hindmarsh was compromised by grazing, by increasing grain protein above 12% shifting the grade from HIND1 to Feed1. For the 2010/11 harvest this was valued at $25/t at the Birchip GrainFlow site. For Correll, grazing did not influence the grade, but seasonally low protein (below 12.5%) for both grazed and ungrazed crops, dropped Correll from AH to AGP segregation.

Interpretation

This work was a demonstration only, and the first time Moby has been trialled in this district, therefore interpretation is limited. However results support other published in Part A of the BCG 2010 Season Research Results such as *Grazing cereals in the Victorian Mallee* and *Farmer experience with Grazing Cereals*, pages 168 and 177 respectively.

Grazing had significant effects on the barley and limited effects on the wheat performance in 2010. Hindmarsh grain yield decreased and protein increased (changing recieval grade) when crops were grazed which would have had a significant financial impact. Correll wheat yields however, were only reduced slightly by grazing, and the recieval grade was the same for grazed and ungrazed crops.

As experienced in other trials and demonstrations, the response to grazing in a low rainfall environment with variable springs is unpredictable for both grain yield and quality; there is a risk for grazed malting barley protein to rise, and for grazed wheat screenings to rise, and protein and test weight to fall, which may present a financial risk to overall paddock performance. These losses in crop performance must be considered, and weighed up against other system benefits such as the value of filling a winter feed gap for the livestock enterprise, letting legume based pastures establish further before grazing and having an area to put stock while spraying pastures for grass.

Forage cereals appear to offer graziers another option to the traditional pastures grown. Moby barley had alot more early growth (forage value) than wheat, and similar growth to commonly used Hindmarsh barley in 2010. Early dry matter production was boosted by earlier sowing and would have been enhanced further by higher plant numbers, ie higher seeding rates and/ or narrower row spacing.

Moby (or forage cereals in general) offer more flexibility for grazing that the traditional cereals as the recovery from grazing after Z30 is far greater.

Further evaluation of the potential to graze traditional crops and forage crops in low rainfall Victoria, is occurring in 2011, with the continuation of this Nullawil BWBL/Grain & Graze demonstration, variety evaluation trials at the BCG Main Site at Corack, and monitoring of demonstration paddocks.

Acknowledgments

This project was supported by the Nullawil Best Wool Best Lamb group, and funded by MLA Producer Demonstration Site (PDS) and Northern Victoria Grain & Graze 2.