Grain and graze systems: Mallee demonstration 2011

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Take home messages

- **forage cereals offer a more flexible grazing resource than the traditional grain cereals**
- **the grain yield penalty as a result of grazing depends on the timing of grazing, the level of grazing pressure and allowing sufficient time for the crop to recover. If these factors are optimised, grain yields will not be affected**

Background

Cereal crops sown early in the season complement grazing enterprises by providing extra feed in winter, when normal pastures are slow-growing.

Last season's demonstrations measured mixed grain recovery from grazed grain crops, and showed that a forage cereal crop can provide high levels of feed production, allowing for grazing over an extended period. The Nullawil Best Wool Best Lamb group was keen to revisit grazing cereals to further explore the potential for cereals to complement their sheep enterprises.

Aim

- to examine the potential for both grain and forage cereal crops to supply feed for grazing enterprises
- to determine the effects of grazing on grain yield and quality to help build informed decisions about when to graze crops to ensure maximum profit

The 2010 demonstrations showed the forage cereals had potential for producing good levels of feed (*BCG 2010 Research Results – Part B*, pp 95-97) but further evaluation from a different season was needed.

Method

A 10 ha site at Nullawil was sown to Moby forage barley, and a small area sown to Hindmarsh barley for comparison.

In order to measure any effects from grazing, small areas (9m^2) were fenced off to protect the crop. The exclusion areas were fenced off before a grazing event. Further exclusion areas were fenced off following each grazing to measure the crop recovery and effects on grain production. The paddock was grazed a total of three times.

Time of grazing was determined by when the co-operator was satisfied there was sufficient feed in the paddock. Prior to grazing, dry matter assessments were conducted, using samples of cereals cut to ground level.

The Hindmarsh barley was grazed twice before reaching the GS30 stage (stem elongation, the stage when further grazing would have damaged the plant's growing point). Moby was continually grazed.

Location:	Nullawil
Replicates:	demonstration
Sowing date:	9 April 2011

Seeding density: 42 kg/ha

Crop type/s: Moby forage barley and Hindmarsh barley

Inputs/Fertiliser: 20 kg P/ha

Seeding equipment: 275mm row spacing

Table 1. Treatments in Nullawil BWBL grazing barley demonstration, 2011

Treatment	Variety	Grazing treatment	Time of year
1.	Moby	Not Grazed	
2.	Moby	Grazed	June/July
3.	Moby	Grazed	June/July & Aug/September
4.	Hindmarsh	Not Grazed	
5.	Hindmarsh	Grazed	June/July
6.	Hindmarsh	Grazed	June/July & Aug/September

Results

At the time of the first graze, (11 June), Moby barley had produced 200kg DM/ha more than Hindmarsh barley (Table 2). This complemented the 2010 demonstration, in which the forage barley variety showed greater early vigour and feed value than the grain variety.

Table 2. Dry matter (t/ha) of barley when grazing commenced, 11 June 2011

Variety	Dry Matter Yield (t/ha)
Moby	0.85
Hindmarsh	0.65

By October, ungrazed Moby barley had produced 7.3t DM/ha and ungrazed Hindmarsh had produced 6.4t DM/ha (Table 3).

Continuously grazed (from June to August), Moby still had 4.0t DM/ha when measured in October. After two separate grazing events, the Hindmarsh, however, had recovered only sufficiently to produce 1.2t/ha.

Hindmarsh that had been grazed just once before GS30 (in June/July), managed to recover its dry matter yield. Subsequently, the grain yield of the single-grazed Hindmarsh was only 0.3t/ha lower than ungrazed Hindmarsh. However the twice-grazed Hindmarsh (with the second grazing event past GS30) failed to produce a crop.

Observations noted that Moby had a better ability to tiller than Hindmarsh when the head was removed by late grazing.

Table 3. Dry matter produced and grain yield of grazed and ungrazed barley at Nullawil, 18 October 2011

Variety	Sheep Numbers and Grazing Period	Dry Matter Yield (t/ha)	Grain Yields* (t/ha)
Moby, ungrazed	-	7.3	-
Moby, grazed June/July	310 ewes (6 days) and 360 lambs (30 days)	5.4	-
Moby, grazed June/July & August	As above plus additional 140 ewes (7 days) and 234 lambs (10 days)	4.0	-
Hindmarsh, ungrazed	-	6.4	2.7
Hindmarsh, grazed June/July	310 ewes (6 days) plus 360 lambs (30 days)	6.8	2.4
Hindmarsh, grazed June/July & Aug/Sep	As above plus 140 ewes(7 days) and 234 lambs (10 days)	1.2	0 (damaged due to late graze)

** Final grain yields of Moby were not harvested, as the crop was affected by water hen damage.*

Interpretation

Moby forage barley produced more early growth and total dry matter production than Hindmarsh. Moby also recovered from late grazing better than Hindmarsh, as demonstrated by the regrowth assessed in October.

Grazing Hindmarsh before the beginning of stem elongation (completing grazing before mid July in this case) provided useful feed with minimal grain yield decline. Grazing in the stem elongation stage resulted in damage to the heads and the crop was not able to recover, resulting in no grain at harvest.

Grain quality between the grazed and ungrazed Hindmarsh was similar, except for protein which was 10.9% and 9.3% for grazed versus ungrazed crop respectively.

While the Hindmarsh grain yields were marginally affected, it is likely that the loss of grain income may have been offset by the grazing value. These had not been calculated at the time of reporting.

Another Hindmarsh demonstration on the property saw no statistical difference between grazed and ungrazed yields or grain quality.

Commercial Practice: what this means for the farmer

- cereals are an under-utilised feed resource, particularly in seasons with late breaks or low rainfall which result in reduced pasture growth and feed shortages in the June/July period. Cereals can also allow grazing pressure to be removed from establishing pastures, allowing them to recover more quickly
- forage cereals offer an alternative to traditional pastures, and more flexibility for later grazing than the grain cereals: they have the ability to recover from grazing later in the season, whereas the grain types seldom do
- yield penalties from grazed cereals can be an issue, but careful timing and stock management can reduce the risk.

Acknowledgments

This project was supported by Grain and Graze II (funded by GRDC and Caring for our Country).