Farmer experiences with grazing cereals

Alison Frischke *(BCG)*

Take home messages

- *In the southern Victorian Mallee environment, grazing crops intended for grain production can be risky, with potential penalties to grain yield and/or quality.*
- *The success of grazing crops (feed value and their ability to recover and maintain yield and quality) relies on an early sowing opportunity and a good spring.*

Background

It is always a challenge to feed sheep in late autumn/early winter once stubbles have been consumed or have lost nutritional value and before pastures are established sufficiently for grazing. In the southern Victorian Mallee, if an early rain falls in March and April, oats and barley are commonly sown to generate early feed. These crops are usually grazed more than once and are sprayed out for fallow, cut for hay or harvested for grain, depending on the season. Alternatively, stock may be supplementary fed or put into containment.

However, if crops sown as part of the normal cropping program (as opposed to those sown for early feed) can be grazed with little effect on yield and grain quality, Mallee farmers will have a way to value-add to crops, maintain or increase the area of crop sown and increase the flexibility of managing livestock. Early grazing of crops between GS13 and GS30 has been successful in high rainfall cropping regions in terms of crop production and overall financial performance, but less is known about how grazed crops can perform in low rainfall regions.

Aim

- To assess the ability of conventionally sown Hindmarsh barley crops at Jil Jil and Nullawil to recover from grazing, the effects on straw and grain yield production and on grain quality.
- To consider the place of early sown feed versus grazing crops in low rainfall farming systems.

This work follows on from a 2009 grazing cereal trial and demonstrations (BCG 2009 Research Results, pp 46-51 and pp 52-55 respectively), and supports the 2010 variety trial at Culgoa (BCG 2010 Research Results, pp 168-173).

Method

Location:	**Nullawil**	**Jil Jil**
Sowing date:	11 May 2010	6 June 2010
Sowing rate:	40kg/ha	50kg/ha
Fertiliser:	37kg/ha MAP + Zn	30kg/ha MAP
Row spacing	6 inch	7 inch
Ave GSR rainfall:	250mm	250mm
2010 GSR:	216mm (but 289mm fell from Oct-Dec)	350mm(111mm in Oct)

Two demonstration paddocks were chosen by farmers. Dennis Ryan at Nullawil selected one of his best paddocks with the thought that if grazing a crop could be economical on 'good' ground, then it should also pay its way on other paddocks. After sowing, 100m x 100m area of the paddock was then fenced off to create the area to be grazed. Warrick and Ian McClelland chose two adjacent 1ha fenced paddocks near the Farming Systems Site at Jil Jil.

All paddocks were sown to Hindmarsh barley, 11 May at Nullawil, and 6 June at Jil Jil, and were managed using the farmers' own machinery and as part of their planned cropping program.

Dry matter (DM) production and feed tests were measured at 5-leaf stage, just prior to grazing. Theoretical dry sheep equivalent (DSE) grazing days were estimated using:

DM (kg/ha) – 30kg/ha (physically unavailable DM) x feedtest metabolisable energy (ME) /8MJ, which assumes that each DSE requires 8MJ/day.

Feed value was calculated using the 2011 Rural Solutions SA estimate for self-replacing merino flock gross margin of $40/DSE/year, assuming that 1 DSE consumes 1kg DM/day.

Both farmers put the stock into the grazing areas and removed them when they had grazed the crops down to the white line (point on stem where tissue changes from green to white) and before GS30. The Nullawil site was grazed from 7 – 12 July with 40 ewes that had just had lambs weaned (45 DSE/ha) and the Jil Jil site grazed from 26 July to 2 August with 40 rams (60 DSE/ha).

Once sheep were removed, crops were grown through to harvest. Dry matter and head counts were measured at maturity. Grain yield was measured by harvesting 15m lengths at Nullawil and 20m lengths at Jil Jil in the grazed and ungrazed areas using a plot harvester and grain quality analysed. Grain yields were corrected to 11.5% moisture.

Results

Nullawil

The Nullawil Hindmarsh barley crop was very lush and on the verge of stem elongation, GS31, when grazed. Luckily this crop escaped severe locust damage, unlike other areas of the farm. DM cuts before grazing measured 493kg DM/ha. Metabolisable energy was 13.8MJ/kg DM, and therefore DSE grazing days were estimated at 799. The grazing value of the crop was $54/ha. Spraying of the grazing site for weeds was delayed until after stock were removed.

Dennis Ryan observed that his barley grew back very well after grazing, but was a few days behind in maturity at flowering time. There was lower vetch contamination in the grazed area: the ewes must have grazed them down or pulled them out.

Grain yield was not affected by grazing but grain quality was. Protein dropped by 0.9% and screenings increased by 0.39% (Table 1). Test weight was unaffected.

Table 1. Crop yield, quality and gross income performance at Nullawil, 2010.

	Grazed	Ungrazed
Grain yield (t/ha)	4.3	4.3
Protein (%)	9.5	10.4
Screenings (%)	1.2	0.9
Test weight (kg/hl)	66.9	66.1
Gross income ($/ha)	1024	979

GI DM based on 2011 Rural Solutions SA estimate for self-replacing merino flock gross margin of $40/DSE/year, assuming that 1 DSE consumes 1kg DM/day. Grain prices as delivered Birchip GrainFlow, 23 December 2010, sourced AWB.

Since the receival grade was not affected by the differences in quality (all made HIND), with the added grazing value the gross income was the same for grazed and ungrazed crops.

Dennis also grazed other paddocks in 2010, including a crop of Yitpi wheat. Locusts had compromised his feed paddocks so he decided to put the sheep on before they got to the Yitpi paddock as well. The Yitpi paddock supported a mob of 200 ewes and 200 lambs for two weeks, and Dennis was very pleased with the crop recovery. The paddock still yielded well. Dennis will be sowing Moby barley and Hindmarsh barley/vetch mix paddocks for feed in 2011.

Dennis also noticed reduced amounts of straw where crops were grazed which will make sowing easier (better trash flow) next season.

Jil Jil

The Jil Jil Hindmarsh barley crop was also 5-leaf when grazed, but because it was sown several weeks later, much less biomass was present. DM cuts before grazing measured 73kg DM/ha, equivalent to 75 DSE grazing days, similar to plots in the 2010 Culgoa trial. The grazing value of the crop was $8/ha.

Ian McClelland also commented that his barley grew back very well after grazing, but was a few days behind in maturity at flowering time.

Grain yield was affected by grazing, with yield decreasing by 0.89t/ha. Grain quality was also affected, but in a different way from that at Nullawil. Protein increased by 2%, but screenings were similar (Table 2). Test weight had deteriorated due to rain by the time the site was harvested, and therefore is not considered in this report.

Table 2. Crop yield, quality and gross income performance at Jil Jil, 2010.

	Grazed	Ungrazed
Grain yield (t/ha)	2.3	3.2
Protein (%)	13.4	11.4
Screenings (%)	1.7	1.1
Gross income ($/ha)	398	687

GI DM based on 2011 Rural Solutions SA estimate for self-replacing merino flock gross margin of $40/DSE/year, assuming that 1 DSE consumes 1kg DM/day. Grain prices as delivered Birchip GrainFlow, 23 December 2010, sourced AWB.

Ungrazed Hindmarsh made the segregation grade HIND, whereas the higher protein of grazed barley downgraded it to Feed 1. This, coupled with low feed value, meant the grazed crop gross income was penalised by $292/ha.

Every season, the McClellands sow any paddocks that aren't cropped to oats and medic for sheep feed. While barley is more valuable than oats, Ian has seen oats recover much faster and sustain feed value longer than barley, and they provide the break against Take-all in the rotation. The oat/medic pasture is spray topped with Gramoxone, allowing medic to dominate during spring.

Final dry matter and head counts are yet to be processed for both sites.

Interpretation

At both Nullawil and Jil Jil, Hindmarsh barley provided good quality feed for growing ewes and lambs, enabling pastures a few days rest or providing alternative feed where locusts had eaten pastures.

Feed value was higher in the Nullawil demonstration due to the early sowing, enhancing fast early growth. This enabled earlier grazing and longer time for crop recovery. Yield and receival grade was maintained, giving the same return as ungrazed. The later sowing at Jil Jil reduced feed value, and with a quality downgrade, the return of grazed crops was penalised. Despite the good year, this is the second season this has happened at Jil Jil (in 2009, the grazed crop incurred a 20% yield penalty).

Dennis and Ian believe that it is risky grazing crops intended for grain in this environment due to variable springs, and the potential threat to yield and quality. This supports results from 2009 in which yield and quality varied at Woomelang and, while yield was maintained at Rainbow (better spring), screenings suffered. However, they do value cereals for their feed benefits and will be sowing them as pastures again in 2011, with the crop outcome (eg. spray topped, hay, grazed to maturity) dependent on season. Dennis and Ian support further evaluation of varieties and agronomy for feed value.

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References

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