

Grazing cereals demonstration 2011, East Binnu

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Aim:	This demonstration looks to assess whether the effects of grazing wheat with sheep during the growing season. Factors being assessed are Yield & quality, dry matter production and grazing value.
Location:	East Binnu
Soil type:	Light yellow sandplain
Rotation:	2010 Lupins; 2009 Wheat; 2008 Lupins; 2007 Wheat

BACKGROUND

GRDC, in partnership with the Federal Government's Caring for our Country program, has committed approx. \$12 million Australia wide over the next 4 years (2010 – 2013) for mixed farming (crop and livestock) R,D&E across Australia called Grain & Graze II. 2million of this will be allocated to Western Australia.

9 farms across WA (with clusters around Geraldton, Kojonup and Esperance) will investigate the grazing of cereals and canola in winter using a paired paddock comparison (with one half grazed, the other half ungrazed). The impact of animal grazing on crop maturity, height and yield, grain quality, disease and weeds will be determined. Livestock productivity will be measured using DSE grazing days.

Linked to these activities (but not funded by Grain & Graze) are 2 small plot trials (Kojonup and East Wagin) conducted by DAFWA (with assistance from John Kirkegaard) investigating the impact that grazing has on the yield of a range of cereal and canola germplasm established at 2 times of sowing. These trials will run in 2010 and 2011.

An economist will analyse the results coming from both the paired paddock comparisons and the small plot trials. These will be analysed both at a paddock scale and at the whole farm scale to determine the economic advantages / disadvantages of grazing cereals in winter.

DEMONSTRATION DESIGN

Plot size: grazed 49.5ha; ungrazed 22.5ha

Machinery: Airseeder – 12m (40 foot)

Crop details: Carnamah wheat @ 80kg/ha on 17 May 2011 (wet)

Fertiliser: At seeding: Agras Extra @ 90kg/ha
Post: FlexiN @ 50L/ha

Herbicide: **Pre:** Sprayseed @ 1.0 L/ha, Trifluralin @ 480mL/ha, Logran @30 g/ha
Post: MCPA @ 400mL/ha, Ecopar @ 400mL/ha, Amine @ 750g/L

RESULTS & DISCUSSION

Plant counts early season

Plant density was optimum for this paddock. Dry Matter cuts were taken during the grazing period (See below). Carnamah has good early growth with excellent biomass. It was selected this year because it was one of the best grain yielding varieties in 2010

(significantly outyielding Eagle Rock). Don has stopped growing Eagle Rock due to yield issues and replaced with the new variety Mace.

Table 1 Plant Counts and Dry Matter cuts 8 July during the grazing period

Growth Stage	(5leaf with at 2 tiller)
Plant Density (plants/m²)	110
Dry Matter (kg/ha)	503

Grazing value

The paddock was grazed slightly later this year due to abundant feed available on the farm. Sheep were in a canola crop before grazing the wheat crop. Sheep began grazing the crop at the 5 leaf stage. It was only grazed once in an effort to try and minimise yield losses from grazing. The crop was grazed at 24.2 DSE/ha for 11 days. The sheep were removed from the crop at the stem elongation stage (Z31). In total there were 267 DSE grazing days achieved from this paddock during this period. At the time of removal of animals from the paddock there was little grazing value left in the paddock.

Other grazing observations

- “Carnamah grazes well”, Don says, however it doesn’t have the advantage of being able to use metribuzin pre seeding. This means that grass weeds like brome grass are less controllable and can present a problem after grazing due to the competitive ability of the crop being reduced due to the grazing.
- The wheat was only grazed once this year to try and minimise yield losses due to grazing. It was however grazed hard right up to removal of sheep from the paddock.
- The window for grazing wheat this year was shorter as the sheep were content to graze the canola before grazing the wheat.
- This year Don used larger mob sizes to reduce work load across the farm. The bigger mobs didn’t seem to affect lambing.
- When rotational grazing during lambing it is tricky to move the sheep without upsetting the mothering process. The sheep tend to hang in the paddock where the wind comes from and don’t want to walk through gates. Don found he had to cut fences to get sheep into other paddocks. He also had to move them very slowly by foot in an effort to keep the ewes and lambs together. Lambing time and rotational grazing are inter related and need to be managed. In the northern agricultural region the grazing window for cereals tends to fall when the sheep are lambing which is an issue.

Table 2 Nairns Grazing days achieved during the year from the wheat paddock and calculated returns from these grazing events.

Area (ha)	Sheep Type	Date in	Date out	Grazing Value *	#	days	DSE grazing Days/ha**
49.5	Ewes and Lambs	5 th July	16 th July	1.5	800	11	267

*= A grazing value of 1 equates to a full grown sheep (1 DSE) **= 365 DSE Grazing Days/ha = 1 DSE annual carrying capacity.

Plant height at maturity

Plant height for ungrazed wheat was 0.70m compared to 0.75m where grazed. There were 212 heads/m² where grazed compared to 250 heads/m² where ungrazed.

Yield & quality data

Grazing reduced the wheat grain yield by 285 kg/ha or 15% (see Table 3). This was significant considering the relatively low yield of the ungrazed treatment.

Table 3 Grain yield and quality measurements from grazed and ungrazed treatments.

	Ungrazed				Grazed				Variation (kg/ha)
	kg/ha	Protein (%)	Screen (%)	kg/hl	kg/ha	Protein (%)	Screen (%)	kg/hl	
Rep 1	1885	10.4	2.7	78	1600	10.4	2.7	78	275

Note: no separate quality measurements were taken for the grazed area vs ungrazed area.

Gross margin calculations

Grazing resulted in a significant reduction in wheat grain income from the paddock. Grazing income from the paddock didn't compensate fully for grain yield losses. The result was a -\$31.87 loss due to grazing. These figures didn't take into account the value of spelling pastures when the sheep are grazing the wheat.

Table 4 Gross margin and profit calculations

Income(\$/ha)		Variation (\$/ha)	Costs (\$/ha)	Grazing Value	Ungrazed Profit (\$/ha)	Grazed Profit (\$/ha)	Variation (\$/ha)
Ungrazed	Grazed						
\$452.40	\$384	-\$68.40	\$211.45	\$36.53	\$240.95	\$209.08	-\$31.87

CONCLUSIONS

- Grazing crops can offer the ability to spell pastures, however careful management needs to be practised to ensure there are no grain yield losses. Grain yield losses can very easily result in a negative profit from grazing crops.
- In this case I suggest that the paddock was grazed heavily in the days leading up to removal of the paddock and this resulted in poor recovery of the crop from grazing. In hindsight I feel that fewer yield losses would have resulted if there was more bulk left leading into stem elongation.
- On the 17th August the Grain & Graze II trial site was visited by the Northern Agri Group (NAG) field day. During the day we had over 100 growers discuss the pros and cons of grazing crops. Both Don Nairn and I addressed the field day and had good feedback about the system.

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