

Grazing cereals demonstration 2011, Irwin

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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:	Irwin
Soil type:	Loamy Sand (Grey Brown)
Rotation:	2010 Lupins; 2009 Wheat; 2008 Lupins; 2007 Pasture

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.

This Demonstration forms part of the Grain & Graze II project looking at the relative merits of grazing canola and cereal crops. Andrew Gillam was interested in grazing the wheat under a lighter grazing pressure regime to determine whether management would be easier and less yield penalty would result compared to the grain and graze trial he conducted in 2010 as part of the Grain & Graze project.

DEMONSTRATION DESIGN

Plot size:	grazed 21ha; ungrazed 84ha
Machinery:	Flexi Coil 1720 bar with 9 inch row spacing
Crop details:	Wyalkatchem wheat @ 80kg/ha on 21 May 2011
Fertiliser:	At seeding: K-Till Extre @ 80kg/ha Post: Urea @ 70kg/ha (28 July- applied on 10 July on ungrazed area)
Herbicide:	pre: Roundup Powemax (18 May); Sprayseed @ 1.2 L/ha, Boxer gold @ 2.5 L/ha and 30 Logran (20 May) Post: MCPA LVE @ 100mL/ha, Ally @ 5g/ha, 0.2% wetter

RESULTS & DISCUSSION

Plant Counts Early Season

Plant counts across the trial site averaged 123 plants/m² which is considered ideal for the district.

Table 1 Wheat grazing demonstration. Plant cuts taken 15 July just prior to animals being introduced to the wheat crop.

	cut weight (1m ²)	kg/ha
site 1	58	580
site 2	43	430
site 3	45	450
site 4	57	570
Average	50.75	507.5

Grazing value

The crop was grazed at the 4 leaf stage just as the crop began to tiller. The stocking rate (17DSE/ha) which was lower than 2010 grazing trial. This was done intentionally to see whether the management of stock while grazing crops was easier and whether less yield penalty would result. The crop was grazed for a total of 13 days giving a total of 218 DSE grazing days from the paddock.

Figure 1: close up of grazed area



Other grazing observations

- Andrew feels that grazing ewes and lambs works better than grazing lambs or hoggets. The Ewes and lambs tend to spread out more evenly across the paddock and resulted in a more even grazing.
- The shape of the block that was grazed was better this year compared to 2010. The shape was more square and therefore the animals didn't have as far to walk, resulting in a more even grazing resulted.
- The sheep tended to graze the broadleaf weeds heavily. This may be an advantage in paddocks where herbicide resistant wild radish is an issue.
- This year there was less scouring when introduced to the crop. Andrew thought this could be due to more lush feed around before the animals grazed the wheat.
- The crop looks to have recovered well from the grazing (10 August). Andrew is happy with the grazing this year.
- Next year Andrew would like to graze both cattle and sheep in the paddock. This may give him the ability to vary stocking rate better by adding and removing cattle to the paddock. Also it may also add to a more even grazing.
- No supplements were used during grazing.

Table 2 Gillams Grazing days achieved during the year from the wheat paddock and calculated returns from grazing 2011.

area	Sheep Type	Date In	Date Out	Grazing Value *	#	days	DSE Grazing Days/ha**
21	Ewes and Lambs	7 July	20 July	1.5	235	13	218

*= 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

There was no visual difference between the grazed and ungrazed treatments. Plant height for ungrazed and grazed was 0.85m. There were 520 heads/m² where ungrazed compared to 497 heads/m² where grazed.

Yield & quality data

There was no yield penalty from grazing this paddock (Table 3). Protein was higher where the crop was grazed which was unexpected. Other quality characteristics were similar.

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

	Ungrazed				Grazed				Variation (kg/ha)
	t/ha	Protein (%)	Screen (%)	kg/hl	t/ha	Protein (%)	Screen (%)	kg/hl	
Rep 1	5.48	10.0	0.87	75.08	5.26	10.7	1.4	75.5	0.22
Rep 2	4.49				4.57				-0.08
Rep 3	3.55				3.66				-0.12
Average	4.50				4.50				0.01

Gross margin calculations

Grazing the wheat on average across the trial site resulted in no loss in grain income. Taking into account the grazing value the grazed area resulted in an increase in profit of \$29.89/ha.

Table 4 Gross margin and profit calculation 2011

Grain Income(\$/ha)		Variation (\$/ha)	Cropping Costs (\$/ha)	Grazing Value	Ungrazed Profit (\$/ha)	Grazed Profit (\$/ha)	Variation (\$/ha)
Ungrazed	Grazed						
\$1,080	\$1,080	\$0	\$277	\$30	\$803	\$833	\$29.89

= Wheat price - \$240/t on farm, Sheep profit - \$50/DSE.

CONCLUSIONS

- There was no yield penalty from grazing in 2011. This was probably due to removal of the sheep at closer to the ideal (ie Z31) Z31 crop stage and possibly the reduced grazing density as well as a favourable finish to the season. This resulted in a profit of \$29.89 in 2011 for the grazed treatment compared to -\$29.74 for the grazed in 2010.

- Andrew is much more comfortable with the system used this year compared to the 2010 regime.
- In the future grazing more paddocks at a lower stocking density may result in a better overall result for the farm.

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