Grazing Canola Demonstration, Nairns

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Purpose:	This Demonstration forms part of the Grain & Graze II project looking at the relative merits of grazing canola and cereal crops. This demonstration looks to assess whether the effects of grazing canola with sheep during the growing season. Factors being assessed are Yield & quality, dry matter production and grazing value.
Location:	Terara (Don Nairn), East Binnu
Soil Type:	Yellow Sandplain
Soil test:	OC 0.66%; NO_3 5mg/kd; NH_4 1mg/kg; P 18mg/ka: PBI 7; K 44mg/kg; S 4mg/kg
Rotation:	2006-2009 Grazing oats
GSR:	365 mm

BACKGROUND

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.

TRIAL DESIGN

Machinery: Nichols Airseeder – 12m (40 foot); Boom – 30m (100 foot)

Trial size: 64 ha. Area grazed - 36hectares.

Crop details: Seeded dry on 17th May 2010 as per diagram below:

45Y82 CL (2.4kg/ha)	Hurricane TT (21.6 ha) 6.8 kg/ha	44Y84 CL (3.1ha) 2.0 kg/ha	571 CL (16.5ha) 3.9kg/ha	45Y82 (20.2ha) 2.4kg/ha

Fertiliser: **At seeding:** 70 Mallee Extra

Post (21/5/10): 60L Flexi N

General Farm Information:

- Merino flock
- 2000 ewes, 38 rams
- 1150 Ewes mated in 2010
- Rams put in on 28th Jan
- Lambing 26 June
- 1300 lambs. Total DSE adds up to 2688
- Crutching 1st Week May
- 8DSE's with grazing cereals
- 33ha of grazing cereals, Rag,Tag and tree lines.
- Without grazing cereals would expect to achieve 3DSE. This would require 896ha of pasture – (paddocks 15,19,18,13,18B,16,6 =446ha). This would mean Don would have to decrease crop area to have sheep or visa versa.
- Bicarb soda if scouring on grazing cereals.
- The goal is to have the sheep off the farm by Christmas

RESULTS & DISCUSSION

Plant Counts Early Season

There was a large variation in plant density throughout the trial site as can be seen in plant count numbers in (Table 1). A seeding rate of 3 kg/ha for the hybrid varieties and 5 kg/ha for the TT (non hybrid) was aimed for. Variation in these target seeding rates was caused by the small areas seeded and variation in seed size. The hybrid canola varieties tended to have a plant density below that recommended (50plants/m2)which would have advantaged these varieties in what was a dry year. The TT canola variety had a plant density above that recommended (60plants/m2) which would have been a disadvantage in such a dry season.

Table 1 *Plant counts & Growth stage (22th June 2010) taken just prior to grazing*

Variety	Seeding Rate (kg/ha)	Growth stage	Plant count
44 Y 84	2.0	4 leaf	18
45 Y 82	2.4	4-5 leaf	10
571 CL	3.9	4 leaf	36
Hurricane	6.8	4 leaf	93

Table 2 *Dry matter cuts (15th July)*

Variety	kg/ha DM
45Y82 ITH	280.00
571CL ITH	222.50
44Y84 ITH	320.00
Hurricane TT	350.00
Average	293.13

Grazing Value

- There was a high weed burden in the paddock, namely capeweed and brome grass. These weeds were sprayed out just prior to grazing but did provide some early feed other than the crop.
- Grazing commenced when the canola was at the 4-5 leaf stage however condition were dry. The crop was grazed at 43DSE/ha during the growing season. The lower plant density and dry conditions resulted in less grazing days being achieved before the sheep had to be removed. The crop was grazed until there were no leaves present but before the crown of the plant was grazed. In total there was 603 DSE grazing days achieved from the paddock with the majority of these occurring during the season (Table 3).
- It is expected that if the season had broken earlier that significantly better grazing value and yield could have been achieved in this trial.

Other Grazing Observations

- The ability to graze the canola crop during the season allowed Don to spell other paddocks. Don feels that this allowed those paddocks to produce more bulk before they were grazed which has been shown to increase total dry matter production in those paddocks.
- Don felt the early growth of the canola crop was significantly greater than if left to produce volunteer pasture. This early growth was a value feed source.
- The use of grazing canola compared to grazing cereals meant that weed control issues that have been building in the paddock can be controlled. In this particular paddock it would have not been able to have a grazing cereal and would have been left out.

Table 3 *Grazing days achieved during the year from the canola paddock and calculated returns from this grazing.*

Area Grazed (ha)	Sheep Type	Date in	Date out	Grazing Value*	#	days	DSE Grazing Days/ha**	Grazing Income ($/ha)***
36	Ewes & lambs	16-Jul	27-Jul	0.9	1540	11	424	$ 58.01
64	ewes	22-Nov	15-Dec	1	500	23	180	$ 24.61
Total							603	$ 82.63

**= A grazing value of 1 equates to a full grown sheep (1 DSE)*

***= 365 DSE Grazing Days/ha = 1 DSE annual carrying capacity.*

**** = See Appendix I for costings*

Plant Height at Maturity

Plant height was not significantly affected by grazing (Table 4). When the Northern Agri group visited the trial site (18th August at Full flower) it was difficult to see where the crop had been grazed. Grower who attended the fieldwalk were surprised how well the canola had recovered from grazing.

Table 4: *Canola plant height just prior to harvest*

	Plant Height (m)		
	Ungrazed	**Grazed**	**Variation (m)**
45Y82 ITH	1.30	1.30	0.00
571CL ITH	1.05	0.95	-0.10
44Y84 ITH	1.30	1.30	0.00
Hurricane TT	0.50	0.56	0.06
Average	1.04	1.03	-0.01

Yield & Quality Data

Harvest yield were unreplicated. The average yield penalty from grazing the canola in this demonstration averaged 16 kg/ha (4%). The highest yielding variety was 45Y82 (grazed) It yielded 334kg/ha more than where it was not grazed (Table 5). Hurricane was the lowest yielding variety in the demonstration. On average there was a slight increase in oil content where it was grazed which was unexpected.

Table 5 *Grazed vs ungrazed yield and oil of trialled varieties*

	Ungrazed		Grazed		
	kg/ha	**Oil**	**kg/ha**	**Oil**	**Variation (kg/ha)**
45Y82 ITH	299.0	37.0	633.0	37.9	334.0
571CL ITH	571.0	37.8	417.0	35.8	-154.0
44Y84 ITH	418.0	36.6	385.0	37.5	-33.0
Hurricane TT	233.0	34.9	150.0	38.1	-83.0
Average	380.3	36.6	396.3	37.3	16

Gross Margin Calculations

Due to the poor season the canola crop was unprofitable after costs when ungrazed. Grazing the canola on average across the trial site resulted in an $8.32/ha reduction in grain income. This was offset by the grazing value of the canola (calculated to be $83.63/ha). Taking this into account the grazed area showed an increase profitability of $91.95 on average. The lowest profitability was achieved by the TT variety Hurricane when ungrazed due to its low yield.

Table 6 *Gross margin calculations of treatments*

	Income($/ha)							
	Ungrazed	**Grazed**	**Variation ($/ha)**	**Costs ($/ha)**	**Grazing Value**	**Ungrazed Profit ($/ha)**	**Grazed Profit ($/ha)**	**Variation ($/ha)**
45Y82 ITH	$ 155.48	$ 329.16	$ 173.68	$ 315.62	$ 83.63	$ (160.14)	$ 97.17	$ 257.31
571CL IT	$ 296.92	$ 216.84	$ (80.08)	$ 315.62	$ 83.63	$ (18.70)	$ (15.15)	$ 3.55
44Y84 ITH	$ 217.36	$ 200.20	$ (17.16)	$ 315.62	$ 83.63	$ (98.26)	$ (31.79)	$ 66.47
Hurricane TT	$ 121.16	$ 78.00	$ (43.16)	$ 245.00	$ 83.63	$ (123.84)	$ (83.37)	$ 40.47
Average	$ 197.73	$ 206.05	$ 8.32	$ 297.97	$ 83.63	$ (100.24)	$ (8.29)	$ 91.95

Gross margin calculated on the following cost assumptions:

- *Canola Price- $520/t on farm*
- *Hybrid Canola seed- $19/kg*
- *TT canola seed (retained)- $0.80/kg*
- *Sheep Profit - $50/DSE*

CONCLUSION

- Canola provided significant grazing value during the growing season as well as during summer.
- The varieties tested showed minimal yield penalties from grazing with some varieties showing a positive yield advantage from the grazing operation.
- Grazing canola crops were able to provide good weed control and will allow the following wheat crop to benefit from this.
- Grazing canola and cereal crops allows farmers to alter their stocking rate quickly and easily as they progress through the season. This practise will mean in better seasons a much smaller proportion of paddocks will need to be left for stock and more paddocks can be taken through to harvest which will result in a significant increase in farm profitability. In poor seasons there will be less paddocks taken though to harvest which will result in a reduction in grain income, higher sheep grazing losses and lower farm profitability. The overall profitability of grazing cereal crops will depend on the frequency of dry years and good years,
- Don Nairn finds that grazing cereal crops takes the stress out of running sheep as there is always an option for the farmer when feed runs short (ie he can simply graze another crop). Hopefully this trial gives farmers a better appreciation of where the dollars fall when crops are grazed.

ACKNOWLEDGEMENTS/THANKS

Thanks to Don Nairn for allowing the trial to take place on his property as well as the many hours involved in recording sheep movements and yield and quality data.

Funding for this project is provided by GRDC, in partnership with the Federal Government's Caring for our Country program as part of Grain & Graze II.

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