Grazing crops in winter has little or no impact on grain yield and quality

Philip Barrett-Lennard, agVivo**; Richard Quinlan,** Planfarm**; Sam Taylor,** agVivo **and Greg Warren,** Farm & General.

KEY MESSAGES

- Grazing of both cereal and canola crops in winter did not significantly reduce grain yield and quality in five out of seven on-farm trials in 2011
- Grazing of both cereal and canola crops in winter provided between 157 and 509 DSE grazing days per hectare of grazing value

AIMS

There is growing interest in the practice of grazing crops in winter. This follows from the recent and rapid expansion in the area of winter crop being grazed in NSW and Victoria. Many WA farmers have now been exposed to the concept of grazing crops, but most are reluctant to 'put the stock in' for fear of receiving a grain yield penalty.

A common misconception amongst many WA farmers is that special 'dual-purpose' crop varieties must be sown when grazing crops. This is not true, and to de-bunk that myth, these trials used common WA grain varieties.

The aim of these on-farm trials, funded by the Grain & Graze 2 project, was to determine the impacts grazing of crops in winter had on subsequent grain yield and quality, production factors such as weeds, disease and nutrition, and livestock carrying capacity.

METHODS

Seven (7) on-farm trial sites were established across the WA wheatbelt from Binnu to Esperance. The host farmers sowed and managed their crops as per their usual individual farmer practice, with a range of cereal and canola varieties in use. When livestock were introduced by the farmer, temporary electric fencing was used to divide each paddock into grazed and ungrazed areas.

Crop growth stage and biomass were recorded when livestock went in and out of the paddock. Weeds and disease levels were recorded on a regular basis throughout the growing season.

Crop yield was determined by one of two ways; (a) using yield monitor data from the harvester, or (b) actual yield data from weigh trailers. The measurements taken from the grazed and ungrazed areas were adjacent to each other and either side of where the temporary electric fence was previously located. Grain yield was measured a minimum of three times per treatment with the weigh trailer method, and a minimum of 100 times per treatment with the yield monitor method.

Animal grazing data has been standardised into a DSE grazing days per hectare figure using a standard set of conversion rates.

RESULTS

Agronomic and grazing data is presented in Table 1. Grazing days, as measured by DSE grazing days per hectare ranged from 157 to 509. Most cereal and canola crops were grazed at or before the safe grazing threshold of growth stage Z30 for cereals and bud <10cm long for canola. There were differences in the amount of crop biomass left at the cessation of grazing (data not presented here). Weed and disease pressure was measured for both grazed and ungrazed areas of each crop (data not presented here), but differences were minor.

Table 1: Agronomic and Grazing Data

Location	Crop	Variety	Sowing date	Stock in	Stock out	Grazing days	Growth stage
Binnu	IT Canola	45Y82	1 May	9 June	22 June	509	Bud 10cm
Binnu	Wheat	Carnamah	17 May	5 July	16 July	267	Z30
Mingenew	Wheat	Wyalkatchem	21 May	7 July	20 July	218	Z31
Kojonup	TT Canola	Jardee HT	29 April	6 July	13 July	373	Bud visible
Coomalbidgup	Barley	Hindmarsh	1 June	14 July	21 July	388	Z30-31
Dalyup	IT Canola	45Y82, 44C79 Rocket	11 May	4 July	8 July	157	6-7 leaf
Neridup	TT Canola	Hurricane	12 May	16 July	25 July	237	Bud visible

* Grazing Days = DSE grazing days per hectare
** Growth Stage = Growth stage of grazed crop when stock removed

Grain yield and quality data is presented in Table 2. Yields of grazed and ungrazed areas did not differ markedly, being within five per cent at all locations except for Binnu and Neridup, where yield was 12 to 15 per cent less in the grazed area. A wide range of grain quality parameters were very similar for grazed and ungrazed areas at all sites.

The high grain yield of the grazed treatment at the Mingenew site is surprising given the crop was grazed at Z31. However this crop was only lightly grazed with a large amount of crop biomass still remaining at the cessation of grazing.

Table 2: Grain Yield and Quality Data

Location	Crop	Variety	Treatment	Yield	Oil	Protein	Weight	Colour	Screen*
				t/ha	%	%	kg/hl		%
Binnu	IT Canola	45Y82	Grazed	2.26	43.4				
			Ungrazed	2.30	43.5				
Binnu	Wheat	Carnamah	Grazed	1.60					
			Ungrazed	1.88					
Mingenew	Wheat	Wyalkatchem	Grazed	4.50		10.7	75.5		1.4
			Ungrazed	4.51		10.0	75.1		0.9
Kojonup	TT Canola	Jardee HT	Grazed	1.65	44.8				
			Ungrazed	1.73	44.8				
Coomalbidgup	Barley	Hindmarsh	Grazed	2.60		9.7	61.9	55	12
			Ungrazed	2.75		9.8	60.4	56	15
Dalyup	IT Canola	45Y82, 44C79 Rocket	Grazed	1.97	45.0	18.5			0.84
			Ungrazed	2.04	44.4	18.7			0.75
Neridup	TT Canola	Hurricane	Grazed	1.33					
			Ungrazed	1.51					

* Screenings % for cereals, Admixture % for canola

CONCLUSION

These on-farm trials demonstrate that the grazing of crops can improve the productivity of mixed farming systems in Western Australia by providing additional livestock feed in winter without compromising crop yield. A significant boost in profitability may be possible if farmers can make use of this additional feed by either increasing stocking rates and/or animal performance or by reducing pasture area and planting more crop.

The farmers hosting these trials adhered closely to the commonly used safe grazing thresholds (Z30 for cereals, Bud 10cm for canola), minimizing any negative impacts that grazing can have on grain yield. There is some evidence to suggest that the amount of crop biomass remaining at the cessation of grazing can, in addition to crop growth stage, impact on final grain yield.

These Grain & Graze 2 funded trials will be repeated in 2012 to build a bigger data set of grain yield responses to grazing. The amount of crop biomass at the cessation of grazing will be measured to better understand the impact this has on plant recovery and subsequent grain yield.

KEY WORDS
Grazing Crops, Cereal, Canola

ACKNOWLEDGEMENTS
GRDC for funding this work as part of the Grain & Graze 2 project. Richard Quinlan, Sam Taylor, Greg Warren and Michelle Handley for managing the trials. Don Nairn, Andrew Gillam, Mike Cameron, Scott Welke, Rohan Marold and Colin de Grussa for hosting the trials.

GRDC Project Code: FGI00007

Paper reviewed by: Dr Mike Ewing