

Grain on Grass

Producer case study: C & M Thompson

Property owner: C & M Thompson
Property name: Colain
Location: Coonabarabran NSW
Annual rainfall: 750mm
Property Size: 640ha
Enterprise: Breeding cows and growing out weaners on forage crops to supply to feedlots
Pasture type: Mixture of improved native pastures, tropical grasses (mostly digit with some consol lovegrass) and temperate pastures (phalaris, chicory and lucerne)
Soil type: Sandy loams to heavy cracking clays

Introduction

The Warrumbungle Mixed Farm Producer Group (WMFPG) was developed to increase the knowledge and skills of the producers involved through joint learning and experience sharing. Members of the WMFPG were a mixed group of producers grazing dual-purpose and winter crops.

There was an opportunity for these producers to utilise feeding equipment and on-farm grain stores to increase weight gain of stock grazing forage/dual-purpose crops and turn stock off more quickly, increasing carrying capacity and, therefore, profitability.

The Grain on Grass project was developed to demonstrate the use of supplementing grain while grazing to:

1. Increase liveweight gain per head per day by 20%
2. Improve carrying capacity through expedited stock turn-off by 3.5%
3. Showcase the utility of grain supplementation during forage crop grazing in preserving carcase quality and meeting market specifications while reducing grazing days by 13%
4. Raise awareness among core producers and 25% of observers regarding the importance of feed tests in assessing feed quality
5. Increase awareness among core producers about utilising carcase feedback to ensure compliance with target market specifications
6. Enhance the skills of 75% of core producers in formulating supplementary feeding rations through the utilisation of feed tests.

Background

The Thompsons' property 'Colain' is in the foothills of the Warrumbungle ranges, with alluvial creek flats running up to volcanic hills that contain arable plateaus on top.

Of the 640ha, 100ha are sown with winter forage crops each year to increase weaner weights to 450kg for the feedlot market, as well as to reduce weed seedbanks so tropical or temperate pasture can be sown.

Over their pastures, the Thompsons run 150 Angus and Angus-cross breeding cows and retain their offspring until 13–15 months old.

Grain on Grass demonstration at Colain

The Grain on Grass project at 'Colain' focused on understanding the profitability and productivity benefits of supplementing Angus and Angus-cross steers grazing forage oats and brassica over winter (**Figure 1**).

The demonstration ran for 60 days, commencing on 12 July 2023 and ending on 10 September 2023, and consisted of 51 Angus and Angus-cross steers.

The cattle were split into two groups, with 14 animals randomly selected for the supplemented (treatment) group and the remaining 37 assigned to the non-supplemented (control) group. Steers were yard weaned so were accustomed to being supplementary fed.

The average starting weight of the control group was 211kg and the average weight of the treatment group was 237kg.

The uneven numbers between trial groups were due to the difference in paddock sizes used in the demonstration, with the treatment group in a 9ha paddock ('Old Cart') and the control group in a 16ha paddock ('Cottage').

The forage oats and brassica mix was sown on 13–14 March 2023, and feed tests were undertaken on the forage oats before developing the grain ration (**Table 1**).

Figure 1: Grazing oats crop



Table 1: Initial feed test results for forage oats

Dry & Grind inc Dry Matter & Moisture			1	2
	LOR	UNITS	Old Cart	Cottage
Dry Matter (DM)	0.5	%	22.7	20.6
Moisture	0	%	77.3	79.4
Standard Forage Package - NIR			1	2
	LOR	UNITS	Old Cart	Cottage
Neutral Detergent Fibre (NDF) - NIR	10	%	35	32
Acid Detergent Fibre (ADF) - NIR	4	%	17	16
Crude Protein (CP) - NIR	2	%	15.7	17.1
Inorganic Ash - NIR	3	%	11	11
Organic Matter (OM) - NIR		%	89	89
Dry Matter Digestibility (DMD) - NIR	39	%	85	86
DOMD - NIR	38	%	79	78
Calculation of Metabolisable Energy (ME) - NIR	4.3	MJ/kg DM	13.0	12.9
Water Soluble Carbohydrates (WSC) - NIR	4	%	18.8	19.6
AFIA Hay and Silage Grade			NO GRADE	NO GRADE

The results of the feed test were then entered into a GrazFeed scenario (**Table 2**).

The animals then grazed on forage oats, with the treatment group started on 1.5kg/hd/day of total ration in a trough. However, shortly after commencing feeding, the treatment group was dropped back to 1kg/hd/day as they weren't eating the full amount.

The total mixed ration consisted of a bypass weaner ration ([weaner_ration.pdf \(sweetbulk.com.au\)](#)) which was placed into a feed troughs (**Figure 2**).

Table 2: Grazed scenario showing amount of supplement fed and the corresponding cost (\$/head), pasture and supplement intake (kg) and weight gain (kg)

Weight of supplement (kg)	Supplement cost (\$/head)	Intake of DM		Weight gain (kg)
		Pasture (kg)	Supplement (kg)	
0.00	0.00	9.12	0.00	1.40
1.00	0.70	8.58	0.66	1.48
1.50	1.05	8.58	0.66	1.48
2.00	1.40	8.58	0.66	1.48

Figure 2: Total mixed ration



Results

Increase average daily gain by 20%

The final weights for the demonstration were recorded on 10 September 2023.

The treatment group had an average daily gain (ADG) of 1.18kg/day and the control group had an ADG of 1.16kg/day, showing only 0.02kg difference between the two groups (**Table 4**).

This was not significant ($P>0.05$) as this difference equated to only a 2% increase in ADG of the supplemented cattle – much less than the expected 20% increase in the initial objectives of the project.

When comparing the Angus and crossbred steers, the Angus purebreds gained on average 510g more per day (Angus=1.43kg/day, crossbred=0.92kg/day).

Improve carrying capacity and reduce grazing days

While the supplemented group didn't achieve the anticipated increase in liveweight gain, the reduced daily intake of the grazing crop did mean that availability of herbage mass was extended when compared to the non-supplemented paddock.

This means there could be an opportunity to either extend the number of grazing days available or alternatively increase the stocking rate to utilise the surplus feed over that same period.

Cost-benefit analysis

Results from the cost-benefit analysis are shown in the tables below (Table 3 – 5).

Table 3: Cost of grain and labour for the treatment group

Treatment group costs	
Total cost of ration	\$3,000
Total cost of labour	\$210
Cost ration + labour	\$3,210
Cost ration + labour (per tonne)	\$535
Cost ration + labour (per kg)	\$0.54
Ration consumed per day (kgs)	100
Ration consumed/head/day (kgs)	5
Cost/hd/day	\$2.68
Cost/hd/demo period	\$160.50

Table 4: Average daily gain and \$ gain per head per day

	Total ADG (kg)	\$/kg Liveweight	\$ Gain/hd/day	\$ Gained through supplementary feeding
<i>Control group</i>	1.16	\$4.50	\$5.22	
<i>Treatment group</i>	1.18	\$4.50	\$5.31	\$0.09

Table 5: Cost benefit per head per day and for the duration of the demonstration period for the treatment when compared to the control group

Cost benefit/day			Cost benefit/demo period/head		
Cost/hd/day (\$)	\$ Return/hd/day	Cost benefit (\$ compared to control)	Cost/hd/demo period (\$)	\$ Return/hd	Cost benefit (\$ compared to control)
\$2.68	\$0.09	-\$2.59	\$160.50	\$5.40	-\$155.10

Evaluation of case study

The Grain on Grass demonstration at ‘Colain’ – where cattle were supplemented with a total mixed ration while grazing an oat crop – demonstrated similar weight gains in both the treatment and control groups.

The treatment group’s liveweight gains were significantly lower than expected.

We believe that an increase in ADG was not achieved in this demonstration due to the steers substituting intake of the grazing oats for an increase in the supplement offered.

However, while the supplemented group didn’t achieve the anticipated increase in liveweight gain, the reduced daily intake of the grazing crop did mean the availability of herbage mass was extended when compared to the non-supplemented paddock.

This means there could be an opportunity to either extend the number of grazing days available or alternatively increase the stocking rate to utilise the surplus feed over that same period.

The results from the initial feed test also indicated high protein and ME levels in the grazing crop early in the season.

This could have contributed to the non-supplemented animals' substantial weight gain, as well as the supplemented group getting limited benefit from the supplement.

Another factor which may have contributed to the lack of difference between the treatment groups was that the area received below average rainfall in winter and spring and subsequently the Thompsons had to destock earlier than usual. If the demonstration had continued, feed quality of the grazing oats would have decreased as it got to reproductive stage. This would likely have been when there would have been an increase in performance in the treatment animals.

The recommendation is that producers undertake some basic calculations before commencing to ensure there is a production and financial benefit to supplementing livestock.

Factors to consider would include the cost of supplementation (commodity prices) and livestock prices (current and future).

For further information:

Claudia Hinrichsen, Local Land Services **T** 02 6841 6500 **M** 0484 073 592 **E** claudia.hinrichsen@lls.nsw.gov.au

