

# FARM BUSINESS FACT SHEET

PHOTO: AM PHOTOGRAPHY

## The economic value of grazing dual-purpose cereal crops



Sheep grazing on winter oats.

### INTRODUCTION

Farmers' attitudes to the role of grazing crops has changed over time from an opportunistic 'feed grab' approach to a planned and strategic approach aimed at improving whole-farm profitability.

Research has shown that grazing crops in Western Australia can deliver improvements to whole-farm profitability of up to 18.9 per cent (Esperance), 19.2 per cent (Moora) and 62 per cent (Katanning) compared with not grazing crops at all. However, there are key management factors that drive the optimum impact grazing crops can have on farm profit.

Grazing crops involves a trade-off between crop yield reductions and the increased performance of livestock. For farm profitability to be improved by grazing crops, either yield penalties must

be eliminated (or minimised) and/or the benefit to livestock maximised so that it outweighs the cost of grazing.

### MODELLED FARM CASE STUDIES

Research conducted with detailed, modelled farm case studies from three mixed-farming areas across WA shows the key to improving whole-farm profitability is to deploy a planned approach that enables grazing of early sown crops by an economically responsive class of livestock, such as twin-bearing ewes. Variation from this combination will deliver either smaller improvements in whole-farm profitability or, at worst, send the farming system backwards (Table 1: exception Esperance scenario 2).

Modelling, validated through consultation with local advisers and growers, was undertaken to ascertain the impact of grazing crops across the whole farm. Models were based on 'typical farms' representing the regions of Moora, Katanning and Esperance. For details of each case study farm see the links in 'Useful resources'.

The baseline for whole-farm profitability, to which all scenarios were compared, was a mixed-farming enterprise with cropping intensities of 60 per cent (Katanning), 70 per cent (Moora) and 80 per cent (Esperance). The crops (barley, wheat and canola) were short-season varieties as per district practice and were sown late April to late May (conventional timing). The remaining area was under pasture with livestock.

The baseline was compared with four scenarios:

- scenario 1 – grazing normally sown (conventional timing) crops with young stock;
- scenario 2 – grazing early sown crops with young stock;
- scenario 3 – grazing early sown crops with a mix of single and twin-bearing ewes (60:40 ratio); and
- scenario 4 – grazing early sown crops with twin-bearing ewes.

In all modelled scenarios the grazing of crops followed best practice crop grazing ‘rules of thumb’ (see ‘Useful resources’ for more information).

Research conducted in Australia’s southern cropping region (Young, NSW) by CSIRO has resulted in the development of ‘safe’, ‘sensitive’ and ‘unsafe’ grazing windows, which are illustrated in Figure 1. Impacts on profit from the scenarios tested in the different regions are shown in Table 1.

## FACTORS DRIVING PROFIT IMPACT OF GRAZING

Despite the idiosyncrasies of each of the case studies, in general the research showed that to achieve the maximum whole-farm profitability from grazing crops it was necessary to graze the crops early with the most economically responsive class of livestock available.

In general, the median whole-farm profit declined when grazing ‘normally’ sown crops, demonstrating that the yield penalties from grazing crops were greater than the benefits delivered to the livestock.

However, when grazing was conducted on early sown crops, the magnitude of the yield penalty decreased compared with normally sown crops. This is due to the higher yields achieved from the early sown crops, which masked some of the yield penalty (Figure 2).

The difference in the yield penalty effect was reflected by the profit levels obtained by scenario 1 compared with scenario 2.

Note that the anomaly of scenario 2 in the Esperance case study (substantially larger positive response than scenarios 3 and 4) may be explained by the grazing of only the barley crops in this situation rather than all crops (barley, canola and wheat). Barley, in contrast to the other crops, did not respond detrimentally to grazing but actually increased in yield,

**TABLE 1 Profit change (measured as a percentage) in response to different scenarios compared with baseline profit.**

|            | Median net farm profit (\$/ha)   |                  |                    |
|------------|--|------------------|--------------------|
|            | Moora  | Katanning        | Esperance          |
| Baseline   | \$250/ha   | \$192/ha         | \$500/ha           |
|            | Percentage (%) of profit improvement or decline compared with baseline |                  |                    |
| Scenario 1 | -14.8  | 0.7 <sup>a</sup> | -16.4 <sup>b</sup> |
| Scenario 2 | -2.8   | 54 <sup>a</sup>  | 18.9 <sup>c</sup>  |
| Scenario 3 | 1.4  | 51               | 5.6                |
| Scenario 4 | 19.2   | 62               | 9.7                |

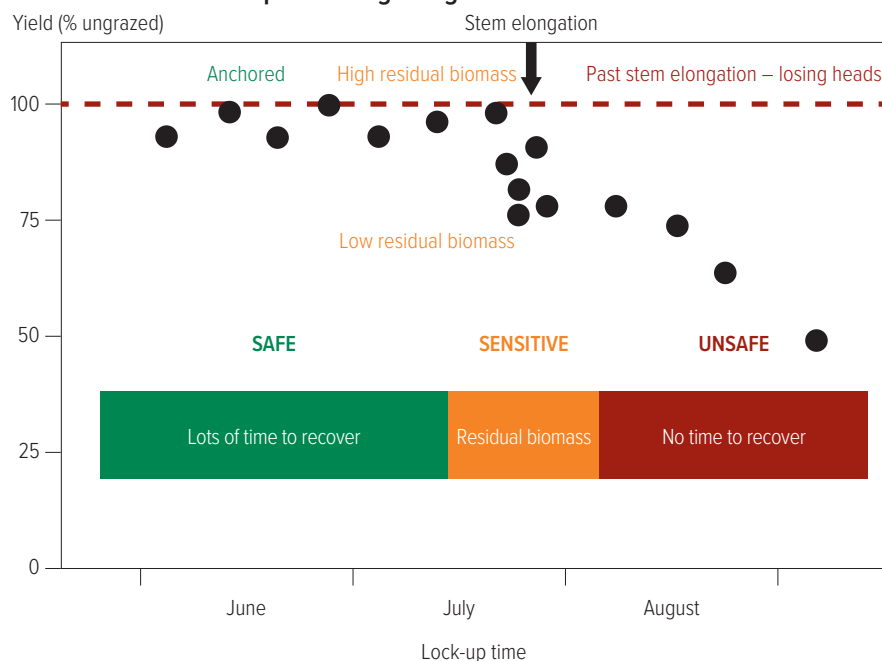
a Crops were grazed by ewes; the difference between scenario 2 and scenario 3 was the pregnancy status of the flock was determined and the flock make up for scenario 3 was set at 60:40 ratio of ewes bearing a single lamb and ewes bearing twins.

b Stock included trade steers.

c Ewes grazed only barley (canola and wheat were not grazed).

SOURCE: GRAIN & GRAZE 3, EXECUTIVE SUMMARY, GRAZING MODELLING, PAGE 3, [www.grainandgraze3.com.au](http://www.grainandgraze3.com.au)

**FIGURE 1 Yield recovery of grazed dual-purpose crops highlighting the ‘safe’, ‘sensitive’ and ‘unsafe’ periods of grazing.**



Note: Yield recovery from grazing during the ‘sensitive’ period for a given target yield is affected by the residual biomass at lock-up. Late grazing (‘unsafe’ period) reduces the time for recovery, so more residual biomass is needed.

SOURCE: CSIRO

which was therefore reflected by an increase in crop gross margin that did not occur for the other scenarios.

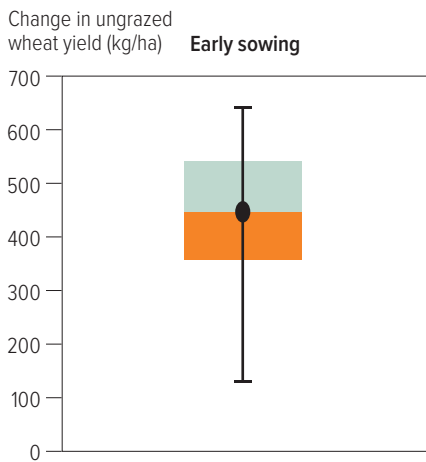
The impact of crop grazing on livestock gross margins was to increase them 100 per cent of the time (i.e. across all scenarios). The magnitude of improvement was determined by management differences within each of the scenarios.

Maximum profit improvement was generally achieved from grazing early sown crops with twin-bearing ewes, the most economically responsive class of

livestock modelled in these case studies. Shifting to twin-bearing ewes is possible when grazing early sown crops due to the extra grazing area made available when crops can be used as a feed source.

The same effect might have been achieved by increasing the flock size, taking into account the extra grazing areas provided by crops. The use of twin-bearing ewes avoids having to purchase more stock. Please note that careful monitoring of ewe pregnancy health and nutrition is recommended, particularly for twin-bearing ewes.

**FIGURE 2** Change in wheat yield with earlier sowing compared with normal sowing (Moora case study).



SOURCE: GRAIN & GRAZE 3, MOORA CASE STUDY  
[www.grainandgraze3.com.au/resources/Moora\\_Chapter\\_Grazing\\_modelling.pdf](http://www.grainandgraze3.com.au/resources/Moora_Chapter_Grazing_modelling.pdf), FIGURE 12

**TABLE 2** Reliability of the change in production factors at modelled farm locations under the four different scenarios.

|                   | Scenario  | Crop GM |       |       |       | Livestock GM |       |       |       | Lambing % |       |       |       | Lamb sale weight |       |       |       | Hogget wool cut |       |       |       | Supp. feeding |     |     |       |
|-------------------|-----------|---------|-------|-------|-------|--------------|-------|-------|-------|-----------|-------|-------|-------|------------------|-------|-------|-------|-----------------|-------|-------|-------|---------------|-----|-----|-------|
|                   |           | 1       | 2     | 3     | 4     | 1            | 2     | 3     | 4     | 1         | 2     | 3     | 4     | 1                | 2     | 3     | 4     | 1               | 2     | 3     | 4     | 1             | 2   | 3   | 4     |
| Western Australia | Esperance | Red     | Green | Green | Green | Green        | Green | Green | Green | Green     | Green | Green | Green | Green            | Green | Green | Green | Green           | Green | Green | Green | Red           | Red | Red | Red   |
|                   | Katanning | Red     | Green | Green | Green | Green        | Green | Green | Green | Green     | Green | Green | Green | Red              | Red   | Red   | Red   | Red             | Red   | Red   | Red   | Red           | Red | Red | Green |
|                   | Moora     | Red     | Red   | Red   | Red   | Green        | Green | Green | Green | Green     | Green | Green | Green | Red              | Red   | Red   | Red   | Green           | Green | Green | Green | Red           | Red | Red | Red   |

■ Increased >75% of the time ■ Increased 50–75% of the time  
 ■ Decreased 50–75% of the time ■ Decreased >75% of the time

SOURCE: GRAIN & GRAZE 3, EXECUTIVE SUMMARY, GRAZING MODELLING PAGE 5, [www.grainandgraze3.com.au](http://www.grainandgraze3.com.au)

## WHAT AFFECTS LIVESTOCK GROSS MARGIN?

Lambing percentage for the twin-bearing ewes (scenario 4) increased by 42 to 62 per cent above the baseline flock (across the different case studies). Within scenario 4, the increase in livestock numbers as a result of an increase in lambing percentage was the sole reason (of the measures recorded) for the improved livestock gross margin.

Other measures recorded, such as livestock sale weights and wool cut per head, either slightly decreased or the change was negligible compared with the baseline flock measurements.

However, the increase in numbers undoubtedly compensated for the decline in these measures. The cost of grazing crops was also recouped from a reduction in supplementary feeding. In general, supplementary feeding was reduced by grazing crops and stubbles. The extent of savings depended on the level of reliance on supplementary feeding to begin with.

## RELIABILITY OF CHANGE IN KEY FACTORS

Table 2 shows the reliability of change, rather than the magnitude, and indicates where the differences discussed between

the scenarios were repeatable. If modelled median profit increased more than 75 per cent of the time it means this upside benefit is much more common than the downside.

## CONCLUSION

Regionalised farm case study modelling showed that grazing crops could produce a substantially positive impact on whole-farm profitability. However, there were a few key management factors that determined the magnitude of the impact grazing crops could have on the business's bottom line.

PHOTO: NICOLE BAXTER



## USEFUL RESOURCES

**Grain and Graze3 website:** [www.grainandgraze3.com.au](http://www.grainandgraze3.com.au)

**Paddock practices – Western, May 2019:** <https://8638fbfd59554b679ff778f16a755928.marketingusercontent.com/m/view/WysnaPoWxw7DpxyTRJLxZ2Zg1aLq6uAESM0U5Tc1twMx>

**Details of the case study farms:**

**Moora:** [www.grainandgraze3.com.au/resources/Moora\\_Chapter\\_Grazing\\_modelling.pdf](http://www.grainandgraze3.com.au/resources/Moora_Chapter_Grazing_modelling.pdf)

**Katanning:** [www.grainandgraze3.com.au/resources/Katanning\\_Chapter\\_Grazing\\_modelling.pdf](http://www.grainandgraze3.com.au/resources/Katanning_Chapter_Grazing_modelling.pdf)

**Esperance:** [www.grainandgraze3.com.au/resources/Esperance\\_Chapter\\_Grazing\\_modelling.pdf](http://www.grainandgraze3.com.au/resources/Esperance_Chapter_Grazing_modelling.pdf)

**Best practice crop grazing ‘rules of thumb’:**

<https://grdc.com.au/resources-and-publications/groundcover/gc109/rules-of-thumb-for-grazing-cereals>

## GRDC PROJECT CODE

**ORM00017**

## MORE INFORMATION

**ORM Pty Ltd**, [www.orm.com.au](http://www.orm.com.au);  
[admin@orm.com.au](mailto:admin@orm.com.au); 03 5441 6176



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**Acknowledgement: Cameron Nicholson, Nicon Rural Services, [cam@niconruralservices.com.au](mailto:cam@niconruralservices.com.au)**

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