

Lifetime Wool - Modifying GrazFeed[®] for WA

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ABSTRACT

GrazFeed[®] is a nutritional management program designed to help graziers make the best use of their pastures by providing predictions of feed intake and energy and protein requirements for different classes of grazing animals. However, inconsistencies between GrazFeed[®] predictions and animal liveweight responses measured in the Lifetime Wool Project are possibly linked to two key GrazFeed[®] inputs: (a) **feed on offer** (FOO, kg DM/ha) and (b) **pasture height** (PH, mm).

Research from the Lifetime Wool project has led to modifications of these two key inputs in GrazFeed[®] which take into account the clover-dominant nature of annual pastures in WA. In addition, faecal samples are being analysed using the alkane technique to estimate feed intake from ewes and wethers grazing annual pastures ranging in FOO, composition and height. These data will redefine the relationship between FOO and intake for pastures common to WA. When completed, these modifications will make GrazFeed[®] a valuable feed budgeting tool for use by WA graziers.

AIMS

In GrazFeed[®], feed on offer (FOO, kg DM/ha) is estimated from calibrations harvested using a shearing handpiece. This method leaves behind a residual amount of pasture which may be significant when compared to the scalpel harvesting method employed in WA. The magnitude of this residual may also vary depending on the stage of maturity of pasture and clover % in the pasture. The functions in GrazFeed[®] which describe the relationships between FOO and PH were generated for grass-dominant pastures with a significant perennial component. However, most pastures in south-western Australia contain a significant proportion of subterranean clover, which is likely to increase as grazing systems intensify to improve pasture utilisation and increase profitability. Because of the prostrate nature of clover, especially under grazing, the relationship between FOO and PH will likely differ from that for grasses. In addition, the more erect nature of pastures early in the establishment stage of maturity [6-8 weeks after the break], compared with the later vegetative/reproductive stage [winter/spring], may also have an effect on these relationships.

Given the sensitivity of feed intake to FOO and PH in GrazFeed[®], we investigated for clover-dominant annual pastures in WA the relationships between (a) FOO harvested using a scalpel compared to that harvested using a shearing handpiece, and (b) FOO, clover composition and PH.

METHOD

FOO Residual

On 3 occasions in 2002 (1 July – establishment; 19 August and 1 October - vegetative) and 2 occasions in 2003 (3 June and 30 June - establishment), pasture in calibration quadrats was harvested first with a shearing handpiece (FOOshears) to simulate the GrazFeed[®] method, followed by a scalpel (FOOscalpel) to remove the remaining residual. Both fractions were sorted, washed, dried and weighed, and then summed to give the total dry matter weight. PH was measured in each calibration quadrat using a ruler, and composition (clover, grass and broadleaf) estimated.

Pasture height

FOO in 1-2ha plots was maintained at target amounts ranging from 300 to 2500 kg DM/ha during winter and spring. Estimates of FOO and composition (% clover, % grass, % broadleaf) were made in quadrats at 30-45 positions along transects in each of 20 plots on the same 3 occasions stated above. The mean PH of the pasture sward was measured in each quadrat using a ruler.

RESULTS

Regression analysis showed significant effects of growth phase, PH and clover composition on the relationships between FOOshears and FOOscalpel for WA pastures. Equations converting WA FOO estimates to GrazFeed® FOO inputs, in the establishment or vegetative stages of maturity, are shown below:

$$\text{GrazFeed FOO Establishment} = -205.5 + 0.8486 \times \text{WA FOO} + 3.33 \times \text{PH} - 92.4 \times \text{clover\%/100}$$

$$\text{GrazFeed FOO Vegetative} = -462.4 + 0.8486 \times \text{WA FOO} + 5.34 \times \text{PH} - 341.4 \times \text{clover\%/100}$$

Regression analysis showed a curvilinear relationship between PH and FOO that varied significantly ($p < 0.001$) with clover composition and pasture maturity (Fig.1). Even with zero clover, lower heights are predicted for vegetative pasture up to about 3 t DM/ha than from the linear relationship that is used in GrazFeed® (viz. 30 mm per t DM/ha). Equations describing these relationships between FOO, PH and clover for establishment and vegetative stages are shown below.

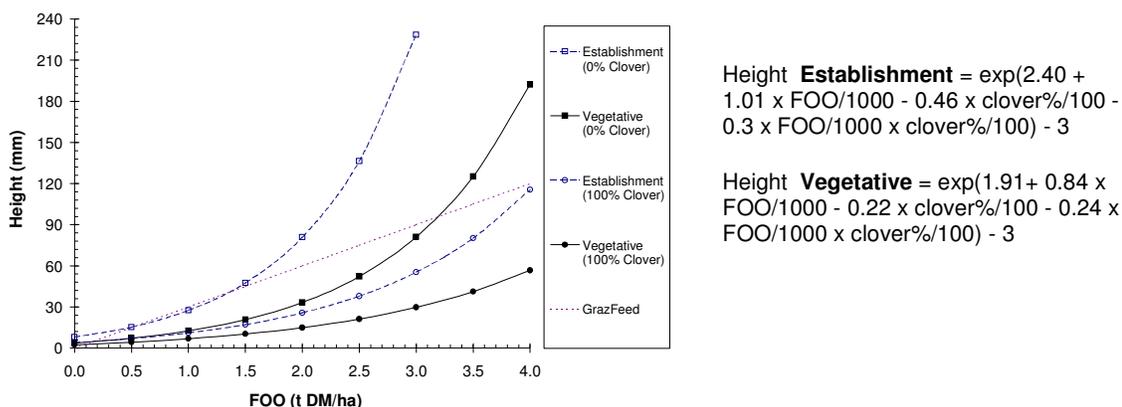


Figure 1. Relationship between feed on offer (FOO) and pasture height (PH) for annual pastures comprising 0% or 100% clover during establishment or vegetative stages at Kendenup, WA.

When used in GrazFeed®, these modified inputs significantly improve the match between predicted liveweight change (LWC) and actual measured LWC (Table 1).

Table 1. Effect of modifications to FOO and height inputs on GrazFeed predictions. Inputs: 48kg lactating ewe, condition 2 at lambing, single lamb 20d old, pastures 78% digestibility and 72% clover.

FOO input (kg DM/ha)	Modified FOO (kg DM/ha)	GrazFeed height (mm)	Modified height (mm)	GrazFeed LWC (g/h/d)	Modified LWC (g/h/d)	Measured LWC (g/h/d)
996	181	30	8	+ 26	-169	-141

CONCLUSION

Modifications to FOO and PH inputs, and ultimately feed intake for sheep grazing clover-dominant annual based pastures, will make GrazFeed® a valuable feed budgeting tool for use by WA graziers.

KEY WORDS

Feed on offer, pasture height, GrazFeed®, liveweight change

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