PUP grazing improves pasture intake and utilisation in kikuyu and annual ryegrass

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Image 1. PUP (left) and traditional (right) grazing strips on 18 April 2021

Pasture intake and utilisation are key factors in reducing feed costs, and in-turn, increasing farm profitability. Pastures are forage sources of low cost, so maximising pasture intake can reduce the use of expensive supplements and increase the margin over feed cost (MOFC) of a cow's daily ration. Also, greater levels of pasture utilisation per season are likely to result in lower feed cost ($/kg dry matter (DM) utilised).

To achieve greater levels of utilisation without compromising a cow's intake requires a change in approach with regards to how pasture is presented. PUP grazing (proportion of un-grazed pasture) has been developed specifically for the subtropics. PUP grazing includes grazing management targets (Table 1 – page 3) derived from recent research findings within the C4Milk project conducted at Gatton, and on commercial farms in Queensland. Our findings indicate that dairy cows achieve high levels of pasture intake only when grazing the top leafy stratum of pastures (Image 2 – page 3). Pasture intake decreases when cows were forced to graze the bottom stemmy stratum (Image 1). Our recent plot studies showed that the highest leaf utilisation per season was achieved when pastures were utilised at 2 and 3 ½ leaf stage for annual ryegrass and kikuyu respectively; and when pasture residues were maintained at 10 cm for both species. The aim of the demonstration trial was to compare the traditional and PUP grazing strategies in terms of pasture intake and utilisation.

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	Leaf stage		Pasture utilisation per grazing		Residue management	
	Traditional	PUP	Traditional	PUP	Traditional	PUP
Annual ryegrass	Graze at **2 ½ to 3** leaf stage**	Graze at **2** leaf stage	Utilise **80% of the pasture on offer****	Utilise **100% of the top leafy stratum** excluding faecal patches	Graze to a residue of 1000 kg DM (or **5 cm**)**	Maintain residues at **10 cm** using mechanical means or non-lactating animals
Kikuyu	Graze at **4 ½** leaf stage*	Graze at **3 ½** leaf stage	Utilise **2/3 of the pasture on offer** above 5 cm stubble height*		Graze, mulch or slash back to **5 cm** of stubble if residues exceed 15 cm*	

Table 1 *Grazing and residue management targets for annual ryegrass and kikuyu*
** www.dpi.nsw.gov.au/__data/assets/pdf_file/0015/163302/managing-pastures-full.pdf*
*** northernaustraliandairyhub.com.au/subtropical-dairy/dairybiz-100/*

Methodology

This un-replicated grazing trial has been conducted at Gatton Research Dairy since November 2019. Pasture allocation and residue management strictly followed the recommendations for each strategy (Table 1). Pastures were grazed by a group of dry cows and pregnant heifers every time the target leaf stage was reached (Table 1) (Image 1 – page 1) The amount of water and fertilizer applied was the same for both strategies so that any differences between strategies were only due to the differences in grazing and residue management, not the amount of water or fertiliser.

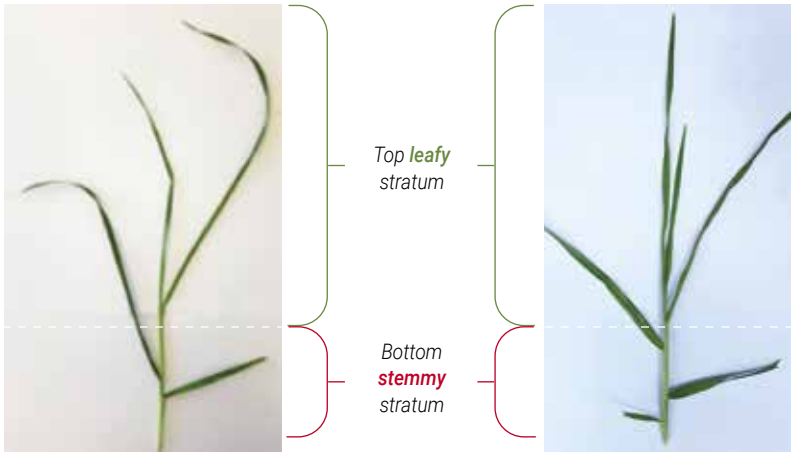

Image 2 *Strata of annual ryegrass (left) and kikuyu (right)*

	Annual ryegrass		Kikuyu	
	Traditional	PUP	Traditional	PUP
Total pasture on offer above 5 cm (kg DM/ha)	1860	1790	1483	1714
Pre-grazing pasture height (cm)	27	25	24	21
Post-grazing pasture height (cm)	11	10	13	11
Pasture utilisation per grazing (kg DM/ha)	1140	1094	608	701
Rotation length (days)	30	20	21	14
Number of grazings	5	7	7	11
Pasture utilisation per season (kg DM/ha)	5700	7660	4458	7709
Pasture intake (kg DM/cow/day)	6.0	10.4	5.0	8.2

Table 2 *Average results for annual ryegrass (May to November 2020) and kikuyu (November 2020 to April 2021)*

Results

Despite the high grazing pressure applied, the cows in the traditional treatment did not graze the pastures down to the target pasture residue. Instead of grazing the pasture short, the mob decreased their pasture intake (Table 2). Therefore, **pasture intake** was 45 and 38 % greater for the PUP strategy for annual ryegrass and kikuyu respectively. This is consistent with the results from our previous grazing trials.

The pasture **utilisation per grazing** was similar when comparing traditional with PUP for both pasture species (Table 2). However, since the rotation length was longer for the traditional treatment (Table 2), the number of grazings per season was greater for the PUP strategy for both species (5 vs 7 grazings for annual ryegrass and 7 vs 11 grazings for kikuyu). Consequently, the **utilisation per season** was 34 and 38 % greater for the PUP strategy for annual ryegrass (5700 vs 7660 kg DM/ha) and kikuyu (4458 vs 7709 kg DM/ha). This is consistent with the results from our previous plot trials.

These results show the potential of the PUP strategy to reduce feed cost of each kilo of pasture consumed as well as increase the MOFC of a cow's daily ration when grazing both annual ryegrass and kikuyu pastures.