



A new grazing management strategy for the Northern Dairy Industry:

Part 1-Pasture structure and selective grazing

By Dr. Marcelo Benvenuti

The Queensland Department of Agriculture and Fisheries (DAF) C4Milk team has developed a new grazing management strategy for tropical and temperate grasses and legumes for Northern dairy farms. Even though pastures differ, this new grazing management strategy or approach uses a set of principles based on current grazing recommendations for each pasture with the addition of new principles derived from new research being conducted at Gatton Research Dairy. This article covers the first principle of the new grazing management strategy that relates to pasture structure on offer to cows and how cows choose to selectively graze the pasture offered. Future articles will discuss other key principles of the new strategy and their practical applicability.

The need for a new set of grazing management principles for northern dairy farmers arises from the unique characteristics and challenges of utilising pastures in both grazing and partial mixed ration (PMR) systems in northern Australia. Our farms are dominated by tropical pastures which have diverse sward structures due to highly variable growth rates, meaning a pasture can be short and lush one day, and tall and stemmy some days later. Given periods of high growth in grass and legume pastures, the forage quality changes rapidly with a decline in the proportion of leaf to stem on offer, particularly for tropical species. Also, high temperatures during summer restrict the number of hours cows graze in both pasture and PMR systems. Pasture substitution may occur as the cows find it easier to survive on the alternative source of feed rather than grazing large amounts of pasture in the extreme heat. This eating behaviour can be reduced if the quality of pasture on offer is of high quality and easily grazed.

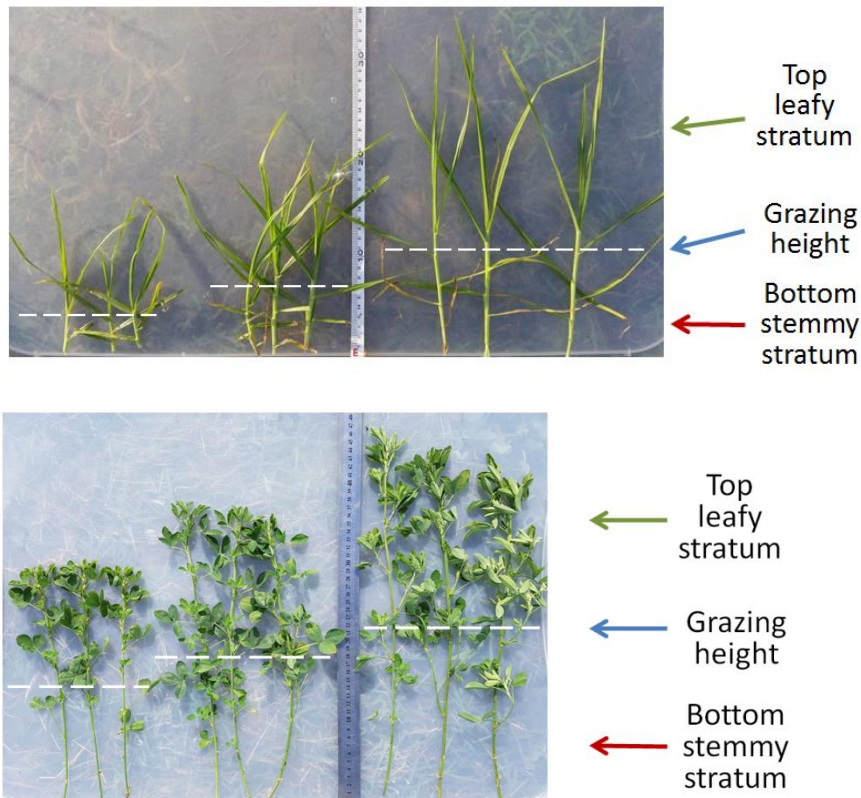
This new grazing management strategy is designed to maximize pasture intake, diet quality and milk production in variable temperature and growing conditions experienced here in the northern dairy industry.

Pasture structure and quality

The structure of both tropical and temperate grasses and legume pastures typically consists of a top leafy stratum and a bottom stratum with a high proportion of stems commonly known as the bottom stemmy stratum. The depth of each of these strata is highly variable due to the specific height of the

pasture at a point in time. This height can vary within a paddock and a pasture species based on the defoliation history of the pasture and irrigation and fertiliser programs. Image 1 illustrates that irrespective of pasture height all grass and legume pastures consist of these two contrasting strata in terms of proportion of leaves and stems. For example, the top half of 40-cm Lucerne pastures has approximately 65 % leaf and 35 % stem. In contrast the bottom half is typically 20 % leaf and 80 % stem.

Image 1. Plant structure and grazing height for Kikuyu and Lucerne pastures observed during grazing trials at Gatton.



This difference in leaf to stem ratio results in large differences in forage quality between strata. Grazing trials at Gatton Research Dairy showed that the nutritive value is much higher for the top leafy stratum than for the bottom stemmy stratum with higher crude protein and energy and lower fibre concentrations (see Table 1).

Table 1. Nutritive value for strata of kikuyu (25 cm height) and lucerne (42 cm height) pastures. Data was collected at Gatton Research Dairy in February 2016 and December 2016 for kikuyu and lucerne, respectively.

	NDF (% DM)	Crude protein (% DM)	ME (MJ/kg DM)
Kikuyu			
Top leafy stratum	43.6	28.6	10.3
Bottom stemmy stratum	55.6	23.5	8.4
Lucerne			
Top leafy stratum	23.4	29.4	10.7

Selective grazing

Dairy cows strongly prefer to graze the top leafy stratum and they only consume the bottom stemmy stratum once the top one has been heavily depleted. Grazing trials at Gatton Research Dairy found that dairy cows consistently grazed the top leafy stratum irrespective of pre-grazing pasture height (see Image 1 and 2 and Figure 1). In a recent grazing study conducted at the Gatton Research Dairy in December 2016, results showed that when dairy cows were forced to graze the bottom stratum of lucerne pastures (imposed by reducing pasture allocation/increasing stocking rate), forage intake and diet quality was reduced. This was because cows were forced to consume a much more stemmy portion of pasture from the lower stratum. The outcome of such grazing strategy was that milk production was reduced.

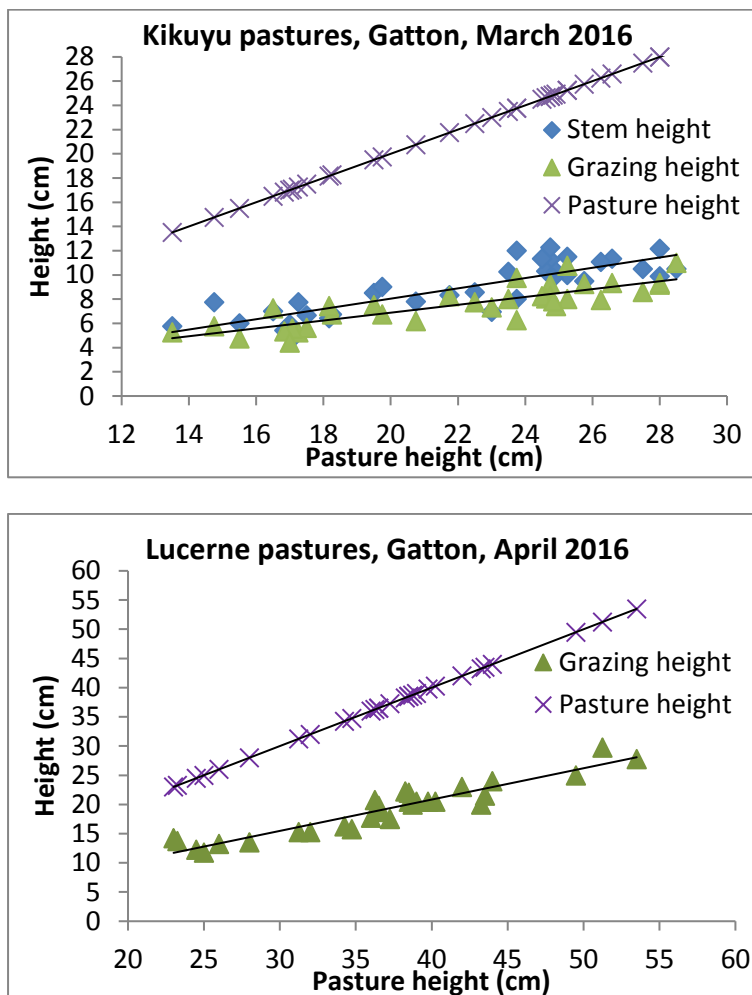


Figure 1. The relationship between pre-grazing pasture height, stem height and grazing height by dairy cows for kikuyu and lucerne pastures observed during grazing trials at Gatton Research Dairy.

Image 2. Selective grazing of dairy cows observed at Gatton Research Dairy.

Cows consistently grazed the top leafy stratum in short or tall pastures



Next article

The second article on this new grazing management strategy will be published in the next edition of Northern Horizons and will cover two key principles on how dairy cows utilise the pastures offered and implications for the management of grazing systems.

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