

# Pasture quality variation between strata of annual ryegrass

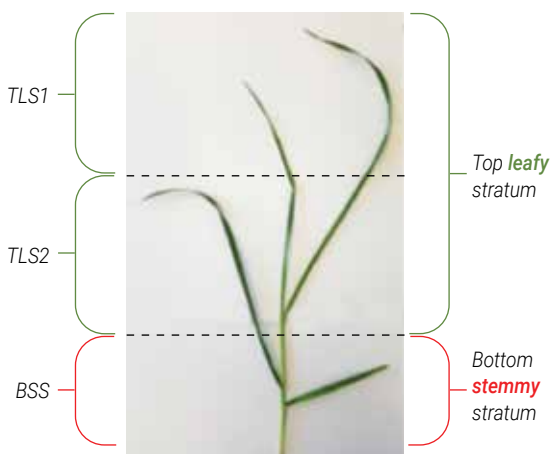
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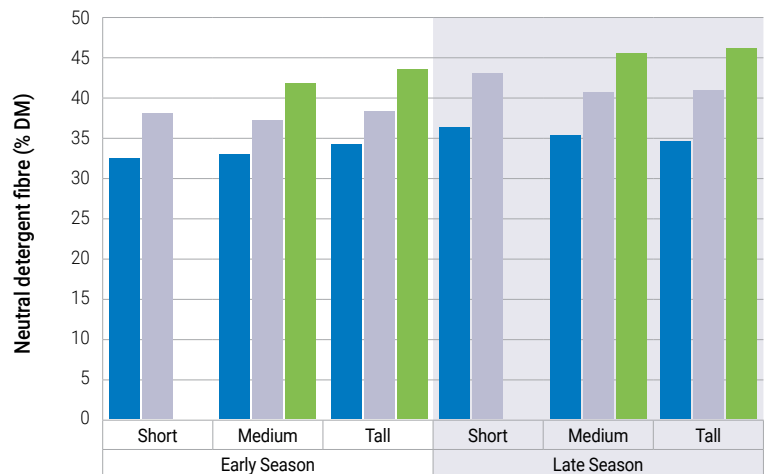
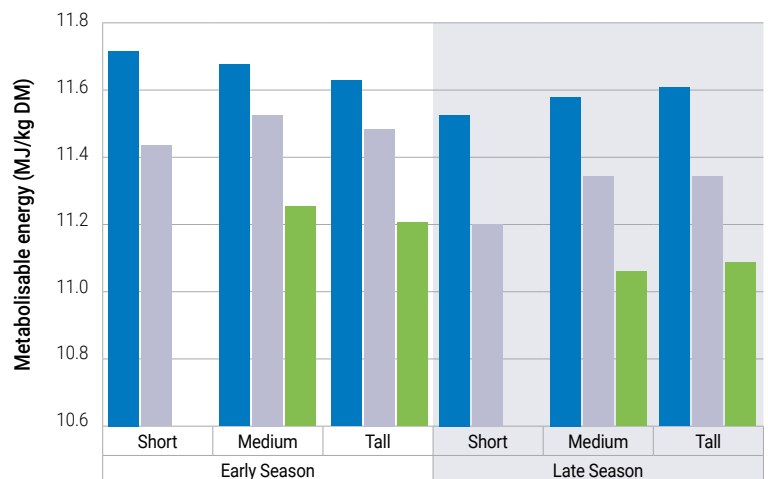
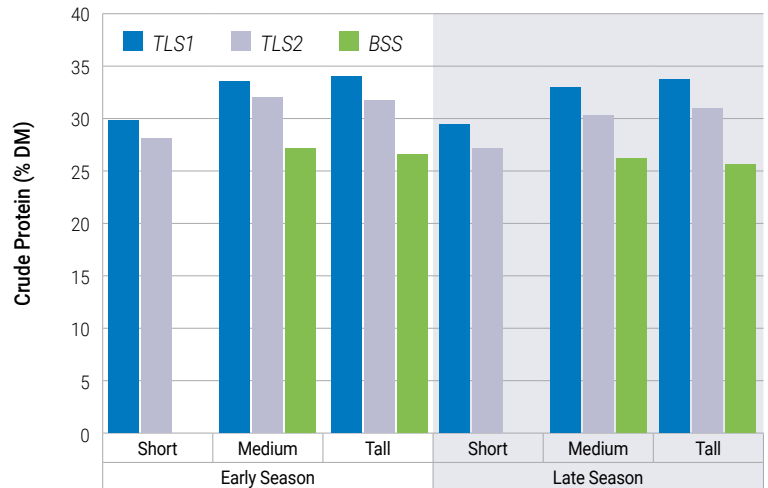
Ryegrass pastures consist of leaf (a top leafy stratum) and stem (a bottom stemmy stratum) (Image 1). Recent grazing studies at Gatton Research Dairy have demonstrated that cows can achieve high levels of pasture intake when grazing the top leafy stratum of pastures exclusively. Bite size and therefore pasture intake decreased when cows were forced to graze the bottom stratum of pastures. This research resulted in the development of a new set of grazing management strategies called PUP (proportion of un-grazed pasture) grazing.

The data from one of these grazing trials was analysed to investigate the difference in nutritive value between strata of ryegrass pastures.

The study was conducted during the 2020 and 2021 growing seasons. The aim was to compare the PUP and the traditional grazing management strategies. The traditional recommendations included grazing at 2.5 to 3 leaf stage, utilizing 80 % of the pasture on offer down to a pasture residue of 5 cm. The PUP targets included grazing at 2 leaf stage, utilizing 100 % of the top leafy stratum on offer excluding



**Image 1** Top leafy stratum (TLS) and bottom stemmy stratum (BSS) of annual ryegrass.



**Figure 2** Nutritive value of the top leafy stratum (TLS) and bottom stemmy stratum (BSS) of short, medium and tall annual ryegrass pastures.



faecal patches and maintain pasture residues at 10 cm. Pasture samples from a range of pasture heights were taken from grazing strips ready to be grazed during the early (June, July and August) and late (September, October and November) ryegrass season.

The results indicated that strata, pasture height and time of the season had an influence on the nutritive value of ryegrass (Figure 1). There was little difference in nutritive value between grazing management treatments; therefore, they are not shown as separate columns in Figure 1.

Strata was the factor with the greatest influence on the nutritive value of ryegrass (Figure 1). The average crude protein (31 vs 26 %) and energy (11.5 vs 11.2 MJ/kg DM) content of the top stratum was greater than the bottom stratum respectively. Fibre content (neutral detergent fibre, NDF) was lower in the top stratum (37 vs 44 %). This indicates that nutrient intake is likely to be higher when cows graze the top stratum.

Time of the season was the second most important factor influencing the nutritive value of ryegrass (Figure 1). The average protein (31.4 vs 30.6 %) and energy (11.6 vs 11.4 MJ/kg DM) content of top stratum was greater early in the season. Fibre content of the top stratum was lower (35.5 vs 38.5 %) early in the season.

Pasture height was the factor with the least influence on the nutritive value of ryegrass. Concentrations of energy and fibre were similar across all pasture heights (Figure 1). However, protein content increased with pasture height. Since all pasture height samples were collected from the same grazing strip within each grazing treatment, this difference in quality between pasture height samples could be explained by soil fertility. Samples of tall pasture were probably collected from patches of higher soil nitrogen content which probably resulted in their higher protein content.

**In conclusion, irrespective of pasture height or time of the season, the nutritive value of the top leafy stratum was greater than the bottom stemmy stratum of ryegrass pastures. Therefore, allowing the cows to graze the top leafy stratum, without forcing them to graze the bottom stemmy stratum, will not only increase pasture intake but also nutrient intake and potentially milk yield. ■■**