Pasture Mass Estimation by the C-DAX Pasturemeter and Rising Plate Meter in Northern Victoria

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Estimating pasture mass is a key component of grazing management strategies for pasture-based dairy production. Several tools for measuring pasture height, including the C-Dax Pasturemeter and Rising Plate Meter (RPM) have been developed to estimate pasture mass in the field. Previous work showed that the relationship between height and mass varies from place to place across different seasons in New Zealand (King *et al.*, 2010). It is thus necessary to establish calibration equations that fit the pastures present in Australia.

This study was carried out at Dookie Robotic Dairy Farm, Australia and consisted of a calibration of three pasture measurement techniques on perennial ryegrass (*Lolium perenne*)/white-clover (*Trifolium repens*) pastures. Ten paddocks from the farm were sampled twice a month between November 2017 and January 2018. For each sample, an even surface in the paddock was chosen for a sampling strip (5 m long × 30 cm wide). The height was measured with C-Dax Pasturemeter first and then with RPM. The strip was then mown to 5 cm residual height, using a mower (30 cm wide, Rhino RC series Flail Mower, Naracoorte, South Australia, Australia). The collected pasture was weighed and sub-sampled. Three quadrats (30 cm x 30cm) were then used to cut from 5 cm residual height to ground level. The collected grass was weighed and sub-sampled. Sub-samples from both mowing and cutting were dried at 60°C for 24 h before recording dry weight. Pasture composition was also determined from each sub-sample. In total, 30 samples were collected to establish calibration equations. The relationship between pasture height and DM yield was analyzed using a linear regression with R software (R Development Core Team).

The linear relationship between height and total pasture mass for the RPM showed a greater R^2 (R^2 = 0.62) than for C-Dax (R^2 = 0.39, Fig. 1). However, the calibration constant for RPM was not significant (P>0.05). All other parameters were statistically significant at the 0.05 level. Dry matter mass from the mower was highly related with total pasture mass (R^2 = 0.87). Pasture mass from Cdax was moderately related to that from RPM (R^2 = 0.72). The average pasture contained 52% dead material (Max: 89%, Min: 8%), 42% ryegrass (Max: 83%, Min: 10%) and 4% white-clover (Max: 20%, Min: 0%). These results suggested that RPM should be preferred by farmers when estimating the pasture mass. However, as estimating mass pasture with C-Dax Pasturemeter is faster than with RPM, the use of C-Dax should also be considered, especially when large scale operation is involved.

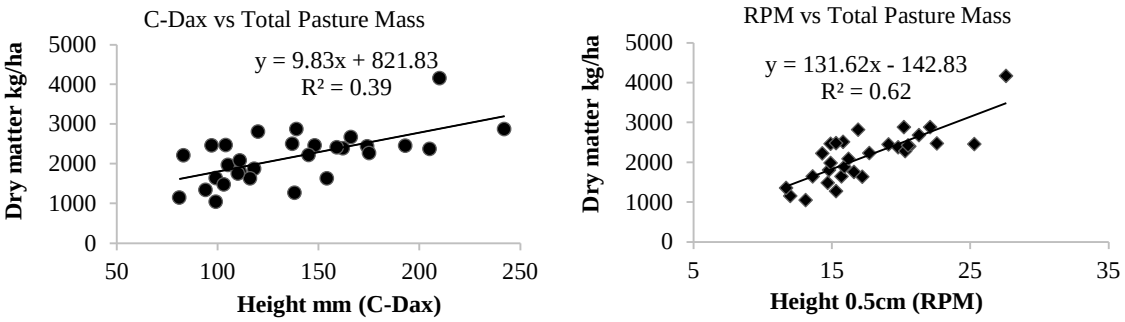

Figure 1: Calibration equations for C-Dax Rapid Pasture Meter and Rising Plate Meter.

References

King WMCG, Rennie GM, Dalley DE, Dynes RA, Upsdell MP (2010) Pasture Mass Estimation by the C-DAX Pasture Meter: Regional Calibrations for New Zealand. In 'Proceedings of the 4th Australasian Dairy Science Symposium.' pp. 233-238.