GPS-Enabled Rising Plate Meter with Data Logging Capability

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Measuring and georeferencing of grassland biomass for regression against vegetative indices is laborious, time-consuming, and subject to recording errors. Clipping and weighing of biomass and georeferencing sampling sites limits the number and the intensity of samples that can be collected in a reasonable time-frame by a single observer. Larger and more densely-spaced datasets may be assembled by multiple observers and by employing indirect methods of biomass estimation, but labor and equipment costs may be limiting. To address these issues, we fitted a laser distance meter to a rising plate meter (RPM) to record compressed sward surface height (CSSH) (1) and used a Bluetooth-enabled personal digital assistant (PDA) equipped with GPS data-logging software to record CSSH and spatial coordinates.

Harmoney et al. (2) reported that CSSH determined by a RPM was linearly correlated with herbage over normal ranges for cool-season grasses, such as tall fescue (*Festuca arundinacea*) ($R^2 = 0.85$). Some RPM device configurations use center poles with 0.5-cm grooves that are counted with gear counters or read directly from a scale. We fabricated a custom RPM using aluminum and fitted a laser distance meter (Figs. 1 and 2) to measure compressed sward surface height and transmit data wirelessly to a PDA.

![Fig. 1. Design and specifications of the GPS-enabled rising plate meter (RPM). The GPS antenna is normally mounted to the top of the RPM, but it may be carried by the operator as long as the offset is corrected.](image)