Rapid pasture meter

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Accurately measuring pasture can significantly improve pasture utilisation and milk production. But manually measuring pasture is time consuming and tedious. Technology has come to the rescue with the development of the Rapid Pasture Meter that can measure pasture while moving stock or travelling across paddocks.

The innovation was developed by the New Zealand Centre for Precision Agriculture at Massey University and commercially launched by C-DAX in New Zealand in June 2006.

Trials conducted by the FutureDairy team at Camden, NSW have provided advice on adaptation to Australian conditions and have determined the calibrations for Lucerne, short rotation ryegrass, prairie grass and Kikuyu. Calibrations for ryegrass/paspalum pastures are currently being determined at Kyabram, Victoria.

Fitted on a stainless steel sledge, the pasture meter is attached to the back of a quad bike and uses light receptors to measure pasture as the meter crosses the paddock. With the bike travelling at 20km/hr, the maximum operating speed, the device measures pasture cover every 27mm, building up a very accurate picture of grass cover. With that frequency of readings measurements taken over dung pats or weeds should not distort the pasture data.

"The meter consists of a series of light and optical sensors at 20mm interval. As pasture passes through the centre of the meter it breaks the beam preventing the light hitting the receptor; for each beam that is obstructed at a particular moment in time, 20mm is added to the height reading. However because of the effect of averaging the effective height increments available are closer to 10mm.

A linear equation is used to calculate the kilograms of dry mater per hectare for a given average grass height.

In the office, the data is downloaded onto a PC where a feed allocation program such as 'P+' calculates pasture available in each paddock and feed deficit. Supplementation options can then be entered and the program will calculate the area to be grazed each day and the amount of supplementary feed required.

Studies have shown that a 10% increase in milk production can be achieved by accurately allocating pasture (and hence feed) on a daily basis, even when pasture is very well managed.

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The benefit comes from utilising pasture that would otherwise be wasted through over-allocation and from improved pasture re-growth by keeping the post-grazing residue at optimal levels.

"The main appeal is the convenience the meter offers. At last we have a quick and accurate way to measure pasture. I think that will mean that farmers will measure pasture more often. Those who haven't previously measured pasture regularly may take up the practice," said Bill Fulkerson.

The Rapid Pasture Meter is likely to be popular with nutritionist and agronomists. Rick Jordan, Horizon Farming is looking forward to putting the Rapid Pasture Meter through its paces. A meter is to be made available to Horizon Farming in its capacity as project manager of the FutureDairy project in South Australia. For many clients Rick and his team measure the pasture in every paddock, every week.

"This operation will be much more timely and hopefully accurate using the Rapid Pasture Meter and we look forward to reporting back on how this tool performs in SA," said Rick Jordan.

The Rapid Pasture Meter is expected to be available on the Australian market this year. In the mean time the team at Massey University have embarked on a project to add quality measurements to the Rapid Pasture Meter.

While near infrared (NIR) technology was found to be inferior to the system developed by the team for measuring pasture quantity, it does provide useful information about pasture quality. Therefore, the aim of the new study is to test the levels of accuracy that can be achieved through using a mixed sensor approach, the light and optical sensors for quantity and NIR for quality.

The spatial and temporal variation will be examined to test the effect of soil water availability, seasonality and response to fertilisers on quality measurements. The present system is capable of producing yield maps for dairy farmers and it is envisaged to go to the next stage and calculate the protein and energy. If this is done through mapping then it will be possible to produce a nutrient balance for each area of the farm and break it down to very small land units.

Clearly the interaction with animals will have to be considered but the technology will be capable of producing maps indicating areas where a greater nutrient leaching is taking place. Other technologies such as GPS collars on cows (in order to track position) are available for the study; this would assist in determining the nutrient inputs from the animals.

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