VALACTA – Dairy Production Centre of Expertise

A disk meter helps you maximize the benefits of grazing!

The disk or plate meter is a practical measurement tool that enables you to estimate dry matter yield per hectare in order to better manage your pastures.

Many scientific studies have shown that pasture feed is by far the most economical component of the dairy cow ration and that grazing affords significant benefits with regard to animal health and welfare. In the United States, where grazing conditions are comparable to ours, a review of 22 studies found that dairy farms that use a pasture-based feeding system make $100 to $200 dollars more per cow per year as compared to farms using a system that confines cows to the barn. This profit stems entirely from a reduction in the costs related to grazing: 50 per cent is the result of lower feeding costs and 50 per cent derives from improvements in animal health and longevity. Here are some of the research-supported conclusions regarding the welfare of dairy cows that have access to pasture:

- they suffer less from lameness (6 studies);
- they suffer fewer health problems such as mastitis, teat damage and hock and knee injuries (11 studies);
- they spend more time lying down (2 studies);
- they have greater longevity (3 studies).

Although grazing presents some definite advantages, pasture management is nonetheless complicated by the fact that forage growth fluctuates considerably over the course of the summer, making it more difficult to manage dairy herd feeding. To overcome these difficulties, many countries that depend on pasturing have developed tools to measure pasture growth, and these instruments are used by producers and advisors alike. For many years now, countries like New Zealand, Australia, Ireland, England and even France, to name only a few, have been conducting research and working with a device called a "disk meter" (see photo).

How does it work?

Initially developed in New Zealand, the disk meter is a tool that is easy to use. You simply walk up and down the pasture you need to evaluate, taking 30 to 40 measurements with the device to ensure you cover the entire area of the paddock. The disk meter is equipped with a moveable plate that rises or falls according to the length and density of the forage. The electronic register records the height of the compressed pasture plants and calculates an average height in order to estimate the number of kilograms of dry matter per hectare of pasture (kg/DM/ha), taking into account the type of plants grown there. The disk meter is calibrated specifically for different types of forage. In Quebec, for example, the most common type of pasture is a multispecies one, composed of both legumes and grasses.

Is the disk meter adapted for use in Quebec?

For the past three years, a project funded by the MAPAQ's Innovbio programme has been in progress in Quebec. The aim of the project is to calibrate the disk meter on the main type of pasture found in the province and to validate its use according to different formulas. The project, called the Réseau de suivi de la croissance de l'herbe (pasture growth monitoring network), will end in the fall of 2014. The 15 organic dairy farms that are taking part in the endeavour are located across three regions of the province: Centre-du-Québec, Bas-St-Laurent and Lac-St-Jean. The main component of the project involves calibrating the disk meter, which entails taking disk meter measurements and samples every two weeks on each of the 15 farms. In all, over 3,000 pasture samples will have been taken over the course of the project. The data collected will be used to determine what one cm of grass, as measured with the disk meter, represents in terms of kilograms of dry matter. In addition to dry matter analyses, a complete forage analysis of each sample will also be done to enable researchers to estimate the nutritive value of the pastures in relation to their height, as measured with the disk meter.

A newsletter on pasture growth

The third year of the project is focused on validating the disk meter. This component consists first of publicizing the disk meter growth measurements through a weekly e-newsletter about the pilot project. The Bulletin sur la croissance de l'herbe (in French only) publishes grass growth and pluviometric data for each of the 15 farms taking part in the project. The data are presented in kilograms of dry matter per hectare per day (kg DM/ha/d). The information is published on a map so that pasture plant growth can be estimated for the farms in a given region. Because forage growth is influenced by pasture management practices, this information is also presented for each of the farms participating in the project. To find out more about the Bulletin sur la croissance de l'herbe, visit the "Organic Dairy Production" section on Valacta's website (in French only).

Software to predict forage reserves

This project is also validating another tool, the software called Herb'Avenir. Developed in France by the National Institute for Agricultural Research (INRA), this software makes it possible to use the disk meter to estimate a farm's available forage supply. During critical periods, producers can thus estimate the number of remaining grazing days to determine if the cows will need to be given more or less feed in the barn. When available forage exceeds grazing capacity in the spring, the software can be used to establish which pastures should be mowed and when, without disrupting the pasture rotation plan.

A multi-purpose tool…

The disk meter has a number of other functions as well. For example, by measuring plant height before and after a paddock is grazed, the actual forage intake can be taken into consideration when calculating the rations, which greatly improves the accuracy of the calculations. The yield of the different types of pastures can also be determined much more objectively in order to compare, for example, the impact of one type of grass in relation to another. In short, disk meter use leads to better pasture management because it provides an objective assessment of the amount of available forage in the pasture, regardless of the type of animal grazing or the type of forage growing there.

…that has proven its worth

Based on what has been observed in countries where the disk meter has been in use for a number of years, this tool opens the door to more precise pasture management by making it easier to implement different measures for technical and economic pasture monitoring. New tools and software are being developed in those countries to make forage measurements even easier and more efficient for both producers and their advisors. With the disk meter adapted for the types of pastures used in Quebec, the possibilities are many. It's now up to producers to put the tool to use so their cows can get even more out of the benefits of grazing.