

## Other AAFC bale-grazing studies

AAFC is also conducting investigations in four geographically distinct sites across Manitoba and in two sites in Alberta. The sites encompass a range of soil textures and include unique grazing and haying management plans, with all sites feeding cattle with whole (intact) round bales. In the Manitoba experiments, three locations – Inglis, Glenlea, and Clearwater – were bale-grazed over the winter of 2010-2011. The fourth location – Brandon – is more mature, having been bale-grazed over the 2007-2008 season.

The studies examined soil and forage health as an indicator of environmental performance. In addition to monitoring soil temperature and moisture, researchers examined soil nutrients using an intense soil sampling regimen, taking between 200-800 samples at each bale. This allowed them to construct a precise picture of the nutrient community and to determine how those nutrients may change, move or affect the surrounding land base over time. Forage health was determined by measuring biomass and by conducting quality assessments according to feed value. Species assessments conducted on all sites monitor the introduction and/or disappearance of species.

AAFC has been assessing the practicality of managing winter feeding sites using images created by optical sensor units. The sensor calculates the Normalized Difference Vegetation Index (NDVI) which is a real-time measurement of the density of green vegetation. It produces an image with a colour gradient of green to yellow to red. The green represents lush vigorous growth and the red represents little to no growth, or residue.

Preliminary results from the Manitoba studies show that the residue packs (layers of organic material comprised of manure and leftover feed) left behind after bale-grazing can suppress forage growth at first but tend to increase production for years afterwards. Additionally, by insulating the ground, they can moderate soil temperature and help retain moisture.

A complementary study is underway in Alberta, following a similar template to the four Manitoba experiments. The study was initiated to evaluate the impacts of winter bale-grazing in a wider range of soil zones. Collectively, the Manitoba and Alberta projects will help increase our understanding of the impacts of bale-grazing from a Prairie-wide perspective, and lead to the development of management tools and recommendations to improve the environmental and economic performance of the practice.

## Transferring the knowledge

Recognizing the growing popularity of winter feeding systems, and increasing uptake of this practice, it is important to provide sound guidance and recommendations to mitigate any negative side effects. Research from AAFC, provincial governments and universities is helping producers to consider the optimum placement of winter feeding sites to reduce or prevent leaching or runoff of pathogens and nutrients



Cattle grazing at the Inglis, MB location.

to waterways or on-farm water supplies. Producers should choose sites that are best suited to receive and utilize nutrients from manure, and should rotate sites annually to prevent nutrient build-up and maximize pasture productivity. NDVI technology may play a role in this task. Attention must be given to cattle density and duration on the sites as well, as different sites may support different numbers of livestock, depending upon soils, slopes, proximity to water and other factors.

AAFC is developing the Wintering Site Assessment Tool: A guide to selecting a wintering site in Western Canada, which can identify best management practices for different feeding strategies on a variety of landscapes. This guide will assist producers in determining optimal placement of their winter feeding site and post-management of their winter site.

AAFC has also created an In-Field Winter Feeding Nutrient Loading Calculator that allows producers to calculate the optimum number of bales per acre, as well as what nutrients bale-grazing is adding to their pastures. The tool can help producers determine the length of time livestock should stay on a site, and predict when a pasture will have recovered sufficiently to allow the cattle to return. These tools will be available to the public very soon.

These efforts, along with those of provincial governments, industry and cattle producers, will help to ensure that winter bale-grazing remains an economic and environmental alternative to confined cattle feeding.

More information on winter bale-grazing can be found on the AAFC website at: <http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1294669298001> and further information on the WEBS program can also be found online at [www.agr.gc.ca/webs](http://www.agr.gc.ca/webs).

Bale grazed 2009/2010

Bale grazed 2010/2011

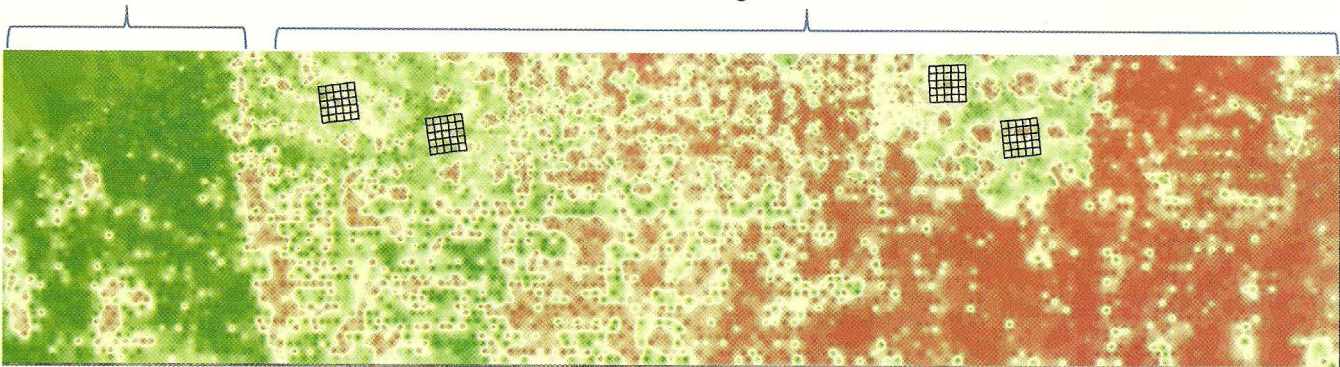


Image created with optical sensor technology to show forage growth distribution in Clearwater, Manitoba in the spring of 2011. The yellow and red areas on the right show even residue distribution on the (2010/11) bale-grazed site, and the vibrant green on the far left shows vigorous growth from a location where the producer had bale-grazed the previous winter (not officially part of the study). This image illustrates both the delay in forage regrowth, as well as the resulting increased vigor.