

## Best Management Practices for Managing Manure on Forage Land

A 100-acre field near La Broquerie, Manitoba, is a unique laboratory for studying the environmental, agricultural and economic effects of using hog manure on grassland pastures.

After three years of study by a multidisciplinary team of researchers, the benefits of applying hog manure to pasture are clear: including a three-fold increase in forage yield and animal productivity and an increase in liveweight gain worth \$175-191 per acre.

The researchers, primarily from the University of Manitoba Faculty of Agricultural and Food Sciences, have also examined the potential environmental impact of hog manure application on groundwater, pathogens, energy use and greenhouse gases.

So far, they have not detected movement of nitrate or phosphorus into the groundwater, nor have they seen evidence that pathogens – such as salmonella and E. coli – can be transferred from manure to pasture vegetation and then to the cattle that eat the forage. And while greenhouse gas emissions increase from land where hog manure is applied, the carbon stored in the larger root mass more than offsets that.

Those were among the findings presented to more than 100 producers and industry representatives at a two-day workshop in March following completion of three years of research at the site. The workshop was funded by the Manitoba Agriculture, Food and Rural Initiatives Covering New Ground initiative, which supports research, demonstration and extension projects related to improving the environmental sustainability of agriculture.

Funding and in-kind support from a wide range of Manitoba and federal government, university and industry sources adds up to more than \$500,000, says U of M researcher Kim Ominski. Covering New Ground is also supporting research into the effect of growing tannin-containing plants on ground fertilized with hog manure.

With support recently received for another three years, she says, scientists will be able to follow longer-term effects of hog manure. For example, scientists will be able to look for the source of anti-biotic resistant organisms found in the groundwater at the site. They'll also be able to see if there is a build-up of nutrients, especially phosphorus, resulting from continuing manure application and examine the stability of carbon storage in the roots.

One unique aspect of the multi-year research initiative, says Ominski, is that extension efforts are built right into the project.

"This could be a model for combining research and extension and incorporating extension into the research," she says, noting the site has hosted several well-attended field days as well.

The range of scientific disciplines – soil, animal, plant and food science plus agricultural economics – is another unique feature.

"I'm sure that we have the most scientists per acre of any field in Manitoba," said the U of M's Don Flaten at the March workshop.

The site is on a 160-acre property owned by HYTEK Limited. During the study, 100 acres were divided into 12 plots for testing different manure management and forage harvesting techniques.

On the plots where manure was applied, a total of 110 lbs per acre of available nitrogen was applied per year, either all at once in spring, or 55 lbs in spring and 55 lbs in fall.

Research into the best management practices for manure is essential in Southeastern Manitoba because of the combination of intensive livestock operations and, in some areas, vulnerable soils, says Ominski. However, the work is applicable far beyond La Broquerie, and producers have travelled from central and western Manitoba to learn the latest findings.