

Feature Research Topic

Livestock production and phosphorus balance - management challenges and options in Manitoba

With the full implementation of Manitoba's P-based manure management regulations deadline expected by 2013, livestock producers are trying to get a firm handle on their options for balancing P application with manure with P removal by crops while keeping their farms productive and profitable. How well livestock producers in Manitoba can adapt to these new regulations depends on the scale at which the challenge is considered.

Manure P – a minor issue at the provincial scale... At a provincial scale, 73% of Manitoba soils are considered agronomically low to medium in P, for which the recommended amount of P added should be at least as great as the amount removed in harvested crops. Yet, Manitoba's livestock industry currently generates enough manure to supply only 15% of crop removal rates for P for the entire province. However, when examined at a regional level, some areas of the province face a tougher challenge than others when it comes to P balance. Recently, agricultural economist Dr. Derek Brewin and MSc. graduate student Collin Gyles identified the rural municipalities of Hanover, La Broquerie and Ste. Anne as the RMs where livestock producers will face substantial challenges to meet these regulations, based on 2006 livestock and crop production census data. In their scenarios, the sustainability of production in a particular RM is further influenced by fertilizer prices, regulatory manure application setbacks, and other manure acceptance factors.

Field and farm scale challenges important in some areas... Regardless of where a farm or field is located, the potential for soil phosphorus build up over time at this scale is substantial, especially if manure is applied on an annual basis to meet crop N requirements. Seven years of research at the U of M's La Broquerie Research Site by Dr. Mario Tenuta, Dr. Kim Ominski and others clearly shows the importance of in-field management of manured land. On this coarse-textured soil, yearly fertilization of hay and pasture land with liquid pig manure to meet the forage crop's N requirements boosted forage and cattle productivity, but led to a build up of soil phosphorus over time. This accumulation was more pronounced in the grazing system where much of the soil P removed by the forages was re-deposited in-field by the cattle. The next phase of research will propose to look at manure and land management options for drawing down the elevated soil phosphorus levels.

In-yard feed management and manure treatment are options to consider... In addition to in-field management strategies, producers can look towards in-yard management such as feeding strategies and manure treatment options to aid in reaching P balance. Researchers Dr. Bill Guenter, Dr. Juan Carolos Rodriguez-Lecompte, Dr. Martin Nyachoti, Dr. Kim Ominski and Dr. Kees Plaizier are working to identify dietary modifications and feeding systems that minimize P excretion while at the same time maintain animal health and reduce costs. Investigations span across alternative feed ingredients, feed processing, feed delivery mechanism and whole diet management for poultry, swine and cattle. At the opposite end of the in-yard management system, Dr. Nazim Cicek is investigating manure treatment options that remove and concentrate P from liquid manure in a form suitable for use as a specialty fertilizer product. Our planned expansion in capabilities at NCLE will see investigations in improved manure composting and solid/liquid separation as well as in-field management of these processed manure products.

Managing the whole system is key... Whole system management can be viewed as connecting all aspects of in-yard and in-field management for the most efficient cycling and use of phosphorus. True solutions for P balance in Manitoba require a whole systems approach where a wide range of management options and performance measures are evaluated. The knowledge coming out of the NCLE multidisciplinary research teams and our long term trials is answering these questions, providing a full range of solutions for achieving phosphorus balance.

Funding in support of these projects provided by NSERC, MRAC, ARDI, MLMMI and multiple industry partners.

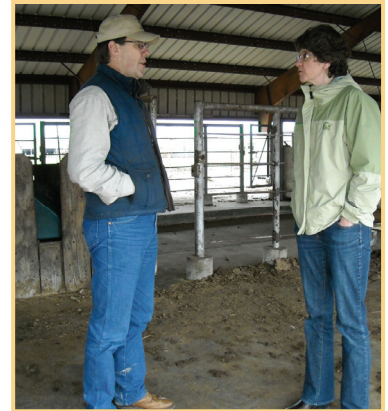
Instant Update

Celebrating one year of the NCLE newsletter!!

We've been working hard to expand our communication efforts at NCLE! Our website and bi-monthly newsletter are the two consistent means of getting the word out on NCLE activities. Throughout the year NCLE research activities are also reported through various media avenues, special seminars, invited presentations and field tours. Not already signed up? Send an email to [Christine Rawluk@umanitoba.ca](mailto:Christine_Rawluk@umanitoba.ca)

NCLE delegation visits Texas A&M University

Texas AgriLife Research at Texas A&M hosted **Christine Rawluk** (NCLE Research Development Coordinator), **Kim Ominski** (forage-beef systems researcher) and **Julieta Frank** (pricing, marketing and risk management researcher) during their visit February 3rd and 4th. Research and extension at Texas AgriLife takes place at Texas A&M and thirteen R&E Centers around the state. The group met with individuals from a number of these centers and gained some hands-on learning at a nearby beef research center. The group also met with the Texas Farm Bureau, who visited NCLE last fall as part of a cross-Canada mission. The visit was arranged by the AAFC Market and Industry Services Branch Manitoba office and the Canadian Consulate General in Dallas.



Kim Ominski talks with Texas A&M beef researcher Gordon Carstens

Official naming ceremony and groundbreaking for the Bruce D. Campbell Farm & Food Discovery Centre

The Discovery Centre will feature exhibits of all aspects of food production, from farming practices to retail sales and will showcase the broad range of careers in the agri-food industry. With 30,000 visitors anticipated annually, the Discovery Centre will be a valuable food production experience for students and families of all ages. The ceremony for the 8,280 square-foot facility, formerly known as the Glenlea Farm Education Centre, took place on December 14, 2009 at the Glenlea Research Station. Construction is scheduled for completion in late 2010. To learn more about the Centre, visit <http://www.umanitoba.ca/afs/ncle/discoverycentre.html>

Faculty Seminar – Feeding Strategies for Healthy Cows

On January 20th, **Kees Plaizier**, dairy researcher, outlined the importance of practicing feeding strategies which help to reduce the frequency and duration of sub-acute ruminal acidosis (SARA) in dairy cows. Kees detailed why this ailment is of greatest concern with lactating cows, where it occurs most frequently. Contact Kees Plaizier for more information (plaizier@ms.umanitoba.ca). Coming soon - view the video at <http://umanitoba.ca/afs/seminars>

Agriculture economics research wrapping up

Graduate student **Collin Gyles** (**Derek Brewin**, advisor) successfully defended his MRAC-funded MSc. research project looking at the viability of using manure as a nutrient source for farms in Manitoba based on varying levels of land user acceptance and fertilizer costs. Graduate student **Mark Flynn** (**Gary Johnson**, advisor) is putting the final touches on his ARDI-funded MSc. thesis project comparing the economics of two group housing systems in terms of sow longevity. Contact Derek Brewin (Derek_Brewin@umanitoba.ca) or Gary Johnson (gary_johnson@umanitoba.ca) for more details.

Newly Funded Project

Review of the literature on control of nutrients in several watersheds

How effective are policy measures aimed at reducing agricultural sources of nutrient loading in various watersheds? Graduate student funding to examine this question was provided by the ERCA network. Project researchers: **Gary Johnson**, **Don Flaten** and **Derek Brewin**. For more information, contact Gary Johnson (gary_johnson@umanitoba.ca).

Visit our **website** <http://www.umanitoba.ca/afs/ncle/> to learn more about these and other **NCLE research projects**.