

# LMMMR News

News from Conservation's Environmental Livestock Program

Summer 2005  
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## New Staff

On May 30, 2005, **Jennifer Shaykewich** joined the Livestock Program team as the Technical Review Officer. She will be coordinating Conservation's Regional staff input for Technical Review Committee reports and representing the department at municipal Conditional Use Hearings for livestock operations.

Prior to joining the Department, she worked as Land Resource Specialist for Manitoba Agriculture, Food and Rural Initiatives where she dealt with land use policy issues. Prior to that, she worked as an Environmental Scientist for a private engineering firm.

Jennifer has a B.Sc. in Environmental Science and a M.Sc. in Soil Science, both from the University of Manitoba. Jennifer can be contacted at 204-945-7084.

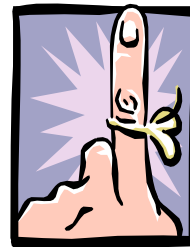
## MMP Briefs

Over the last year, the manure management plan registration forms and submission deadlines have changed. Producers or professionals submitting a MMP for registration must now use the new forms and meet the new deadlines. Here are the highlights of the changes.

- **The deadline for filing** a MMP is **July 10**, which applies to fertilization programs beginning the following fall, and continuing the spring after. A later deadline for spring and summer spreading only is **February 10**.
- The "new" **MMP** now includes details about **storage, handling and transfer of** manure. In other

words, any livestock operation with 300 or more animal units must file a MMP even if spreading is not planned.

- The option of **E-filing your MMP is now available with MMPfiler**. MMPfiler is a software designed for helping livestock operators and consultants prepare and file manure management plans. The software is a database for direct entry of the required information into an organized and systematic



**Don't  
Forget!!**

1. *Spreading after November 10 is considered winter spreading. Large setbacks from surface water, wells, etc. are required. Only operations less than 300 AU and that were in operation before 2004 and some operations that are between 300 and 400 AU are allowed to winter spread.*
2. *Be sure to submit your soil tests to Manitoba Conservation before spreading manure.*
3. *Direct discharge of manure from spread fields is prohibited: stay away from watercourses!*
4. *Source water sample results must be submitted to Manitoba Conservation annually prior to December 31.*
5. *Applications for registration of non-permitted storages should already be in to your regional office.*

fashion. Manure management plans can then be e-filed through electronic mail over the internet (i.e. by e-mail) and printed for your records. The software also allows for filing of amendments. Attachments such as soil test reports can also be e-filed if they are in a PDF or JPG file format. MMPfiler can be downloaded from the Manitoba Conservation Environmental Livestock Program webpage via the following link: [www.gov.mb.ca/conservation/regoperations/livestock/mmpf](http://www.gov.mb.ca/conservation/regoperations/livestock/mmpf)

- o **Agriculture Capability** – MMP must now show both **soil class and subclass** for MMP registration. This refers to the soil class as described in The Canada Land Inventory (CLI) Report No. 2, published in 1972 by the Government of Canada, Dept of the Environment. This information is available on the Agri-Maps website of Manitoba Agriculture, Food and Rural Initiatives (MAFRI) at [geoapp2.gov.mb.ca/website/mafri](http://geoapp2.gov.mb.ca/website/mafri). Other resources include MAFRI staff, and Manitoba Land Initiative (MLI) website at [mli.gov.mb.ca](http://mli.gov.mb.ca).

due to the wet weather; however we were able to successfully begin sampling in some areas of western Manitoba. During the summer we will focus on sampling forage fields, then once the crops are harvested we will sample post harvest until freeze up.

As always we are sampling to a two foot depth and at 15 or more locations per field. Our preferred sampling tool is the soil core sampler (Fig. 1), which works best in sandy loams to finer soils that have little in the way of gravel or stones. In tough soil conditions this is not always an easy task, but we are aided by using a power auger type sampler when the going gets tough (Fig. 2). Samples are put on ice immediately after collection.

Out of concern for the producer's crop, whenever we have to sample during the growing season, we use an ATV to minimize damage to crops. In the fall, when soil conditions permit, we may drive over the field with our truck.

## Registration of older manure storages

Another amendment to the *Livestock*



Figure 1. JMC Backsaver soil core sampler (available at [www.jmcsoil.com](http://www.jmcsoil.com)).

*Manure and Mortalities Management Regulation MR42/98* requires that all earthen manure storage structures built before 1994 and concrete or steel manure storage facilities built before 1998 be registered. So far, upwards of 300 producers have filed their application for registration.

**Have not applied yet?** - Operators who have not submitted their application for registration of older

## What's New?

The Manure Application Rate Calculator "**MARC 2005**" replaces MARC98 as Manitoba Agriculture, Food and Rural Initiatives's software for manure management. MARC 2005 integrates all of the extension recommendations developed by MAFRI to help producers and consultants determine manure application rates. More information can be found on MAFRI's website at [www.gov.mb.ca/agriculture/livestock/marc](http://www.gov.mb.ca/agriculture/livestock/marc).

## MMP Audit Program

The 2005 MMP Audit is underway, with about 50 operations notified and 10 operations audited so far. Spring soil sampling conditions have been poor in many parts of the province



Figure 2. TSS Soil Sampler – a powered screw auger with a jacking handle for recovery of soil samples (available from [aasoils.com](http://aasoils.com)).

earthen liquid manure storage, steel or concrete tank, underbarn storage, molehills, or a constructed storage for solid manure must do so immediately; application forms can be obtained from our offices or from [www.gov.mb.ca/conservation/regoperations/livestock](http://www.gov.mb.ca/conservation/regoperations/livestock)

**Registration process** – Manitoba Conservation staff are currently reviewing applications to prioritize them in regards to potential environmental risk. We will initially focus on storage facilities located in environmentally sensitive areas as well as those which are unlikely to pose risks for the environment. Manure storage facilities that are located in environmentally sensitive sites will be identified and slated for inspection as soon as practical. At the same time, staff will attempt to fast track registration of storages that are a) located in sites presenting low environmental risks, and b) are structurally sound. The remaining manure storage facilities will be addressed in a second phase.

**Timelines** – Our best estimates suggest that there are more than 800 older manure storage structures currently in service in Manitoba. Our staff remains committed to reviewing permit applications for construction of new storage facilities and confined

livestock areas or expansion of existing ones, as well as inspecting storage structures erected under the authority of a permit. Consequently, we anticipate that the registration process will extend beyond this current fiscal year (2005-06).

## Nutrients in Liquid Manure...

Managing manure nutrients is not an exact science. In the case of liquid manure, it is very much of an art to determine, estimate or just guess the nutrient value in this farmyard fertilizer source. Underestimating the manure nitrogen content will eventually result in elevated soil nitrate levels. During our audits, we came to the conclusion that some livestock operators or manure management planners may have had such difficulties, which sometimes led to enforcement actions. This article discusses a few important aspects about measuring or estimating nutrients from liquid manure that individuals involved in manure management and land application may find useful.

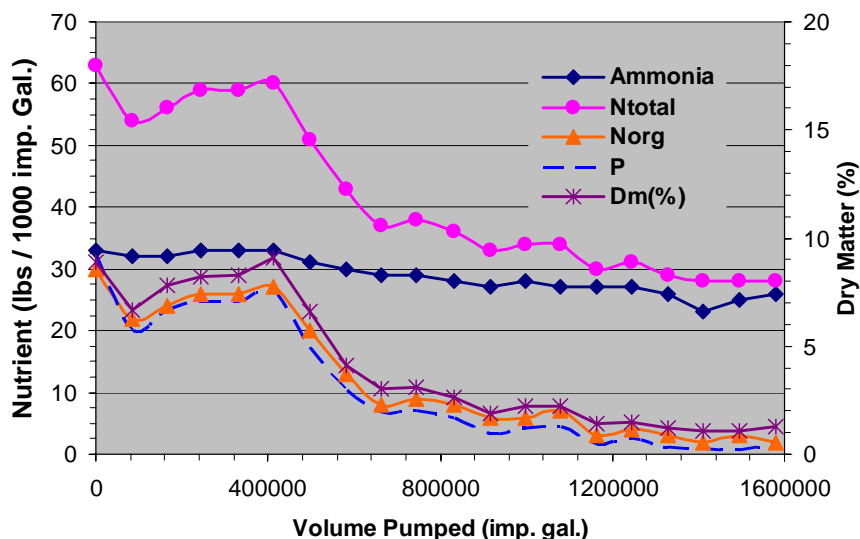
**Average values: the ball park** - The Soil Fertility Guide, the *Farm Practices Guidelines for Hog Producers in Manitoba* and the Tri-

Provincial *Manure Application and Use Guidelines*, amongst other sources, suggest average values that are fairly representative (most of these sources are available from [www.gov.mb.ca/agriculture/soilwater](http://www.gov.mb.ca/agriculture/soilwater)). While average nutrient content values are excellent for determining how much crop land is required for land application, nutrients in liquid manure may sometimes vary greatly during the storage facilities' pump out.

**N-variation during pump-out** - The report *Fluctuations in Manure Nutrient Concentration during Swine Storage Pump-outs* (Dyck, 2003 – available at the link [www.manure.mb.ca](http://www.manure.mb.ca)) clearly demonstrates that both the total nutrient content and, in particular for nitrogen, its form can change dramatically as the manure storage facilities are emptied.

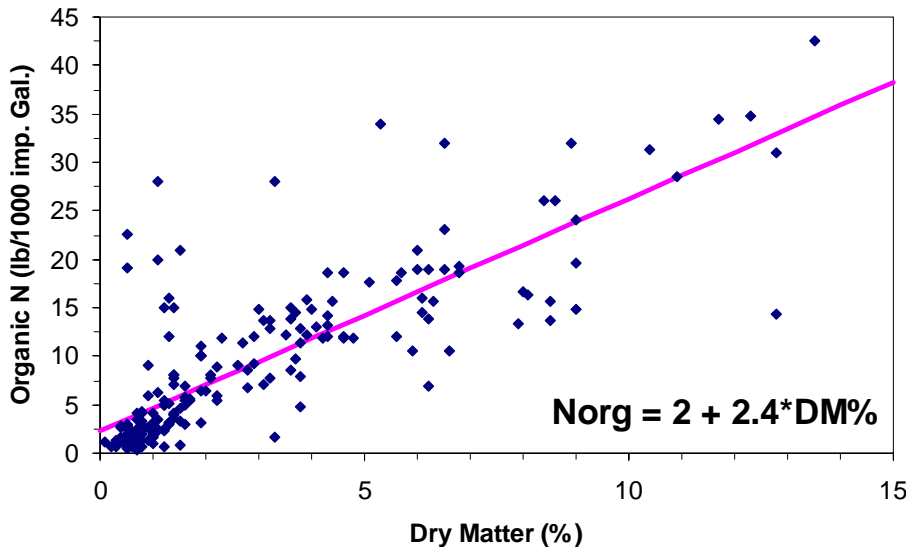
In the case of single cell earthen manure storage facilities, while the ammonia content may be quite constant, the organic nitrogen content is not, and may double as the pumping progresses beyond the halfway "mark". During pump-out of two cell earthen manure storage structures, again the ammonia content could be considered relatively constant (Fig. 3), but the organic nitrogen content may decrease to a fraction of the initial values once the liquid manure from the second cell is mixed with the "thicker" manure in the first cell. Circular tanks (concrete or steel), which afford the use of more vigorous agitation equipment, may provide more uniform nutrient content during pump-out if agitated for long enough. As shown in Fig. 3, the organic nitrogen and phosphorus in manure are correlated with solids content, which make up the bulk of these two nutrients.

**Don't discount organic N** – The variation of organic nitrogen, and hence the total nitrogen content in liquid manure, is closely related to the solids or dry matter content in liquid manure. The "thicker" the manure, the more organic nitrogen it contains. Since the ammonia is nearly constant during the pump-out, liquid manure



**Figure 3.** Variation in swine manure nutrients and solids during pump out of a two cell liquid manure storage facility; manure from the second cell was transferred into the first cell after 400 000 gallons were pumped out of the first one (data adapted from Dyck, 2003).

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**Figure 4.** Relationship between organic nitrogen content and solid dry matter content in 206 liquid manure samples from hog operations in Manitoba (data from MARC98).

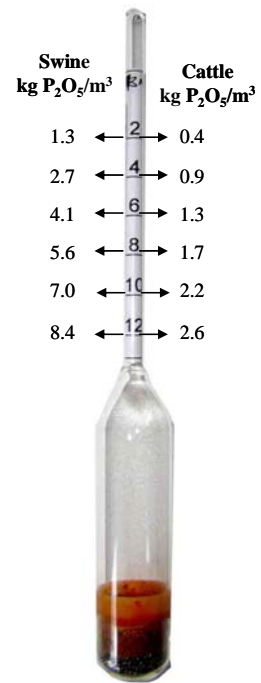
containing **more solids** will have a **higher total nitrogen content** (Fig. 4). Anywhere between nearly 0 up to 50% of the total nitrogen in liquid manure may be organic nitrogen.

**What can be done about it?** – It is always easy to review laboratory analysis report to appreciate what was in the manure. However, this may be a few days or even weeks after the spreading is completed... Some livestock producers and applicators use field kits or meters such as the Agros’s “Nova” meter (Fig. 5 -see [www.agros.se](http://www.agros.se)), which is marketed as a field kit for measuring ammonia and phosphorus in manure. When in good operating condition and if used properly, the Nova meter should provide good estimates of the ammonia in liquid manure.

The Nova meter readily provides an estimate of the solids content of liquid manure with the hydrometer included in the field test kit (Fig. 6). The data

in the MARC98 software shows a good relationship between the amounts of solids and organic nitrogen (Fig. 4). This information can be used to estimate the amounts of organic N in liquid manure from its solids content. MMP professionals and even producers can develop their own relationships to better estimate organic nitrogen content. Refer to MAFRI’s *Manure Application and Use Guidelines* for information on the fertilizer value of organic nitrogen in manure.

**Soil tests don’t lie!** – The ultimate report card on how well the applicator, the manure management planner and the producer have jointly done in regards to manure application remains the soil test laboratory report. Barring inclement growing season conditions and poor crop yields, soil nitrate levels in the first 24 inches of soil should not be much higher than 60 lbs/ac, (rated a “high fertility” value in MAFRI’s Soil Fertility Guide). When the soil test results show nitrate levels that increase beyond this level from one year to another, more nutrients are applied than the crop can take up. This can be the result of underestimating the nutrient value in manure. If this occurs, a sound approach is to review the manure nutrient testing approach and reduce application rates.



**Figure 6.** The Nova meter field test kit includes a simple hydrometer which directly gives the dry matter (solids) content of liquid manure (see [www.agros.se](http://www.agros.se)).

## Important Dates

**July 10** – Manure management plan filing deadline for fall spreading.

**August 15** – “Normal” beginning of the 2006 crop year spreading season.

## Who are you going to call?

Manure management plan questions should be directed to Headquarters. Matters regarding all other aspects of the *Livestock Manure and Mortalities Regulation* should be directed to the Regional contacts. For reporting a spill, emergency spreading, or any emergencies, call your Regional contact. After hours, use the emergency response number.

<b>Emergency Response</b> 944-4888	
<b>MMP</b>	<b>Headquarters Operations</b> Ph: 945-3078 Winnipeg Fax: 948-2420
<b>Regional Contacts Manitoba Conservation</b>	<b>Interlake</b> Ph: 642-6095 Gimli <b>Eastern</b> Ph: 345-1447 Lac Du Bonnet <b>Central</b> Ph: 346-6068 Steinbach Ph: 945-5303 Winnipeg <b>Western</b> Ph: 726-6167 Brandon



**Figure 5.** Ammonia test meter included in the Nova meter model Mk3 field test kit (available from [www.agros.se](http://www.agros.se)).