

MANURE APPLICATION

Livestock and Off-Farm Sources

Why should you be concerned?

Applying manure, either fresh or composted, to agricultural land can be a sustainable way for livestock producers to recycle nutrients on the farm. Manure is considered a fertilizer because it is a source of plant nutrients. It is also a soil amendment because it adds organic matter, which enhances soil quality by improving soil tilth, structure, aeration and water movement. When applying off-farm nutrients other than manure, constituents in the product should be taken into consideration that may not be utilized by the crop (i.e. heavy metals in municipal sewage sludge).

The goals sought when using livestock manure as a fertilizer should be to:

- Maximize the utilization of manure nutrients by crops; and
- Minimize the risk of polluting surface water or groundwater.

Manure serves as a viable substitute for commercial fertilizer because it is readily available on-farm and contains major plant nutrients. However, manure is typically an unbalanced fertilizer, in that nutrients are rarely present in concentrations which enable application rates to closely match crop requirements for more than one nutrient. In Manitoba, manure is usually applied to meet crop nitrogen requirements. As a result, other nutrients such as phosphorus may be applied in excess of crop needs.

Other factors that make manure management challenging include:

- High variability in moisture and nutrient contents which make it difficult to estimate nutrient availability to crops;
- Low nutrient content per unit weight or volume of manure which limits the distance that manure can be transported economically; and
- Potential presence of microorganisms that can cause disease in humans.

Improper management of manure may lead to soil, water and/or air pollution.

Nitrates are highly soluble in water. When manure is added to soil, some of the nitrogen in the manure converts to nitrate. After snowmelt, heavy rain or poorly managed irrigation, excess water can leach down through the soil, carrying nitrate with it past the root zone to groundwater. Nitrate leaching to groundwater is a higher risk in coarse textured and gravelly soils or soils with fractured bedrock near the surface. Elevated levels of nitrate in groundwater that is used for drinking poses a health concern because of the direct link to Blue Baby Syndrome in infants.

When certain nutrients, particularly phosphorus, enter surface water through runoff or soil erosion, they stimulate the growth of algae and aquatic plants. The death and decay of large colonies of algae, called blooms, deplete oxygen which can kill fish. Blooms of certain algae can also release toxins that are harmful to aquatic life, livestock and humans if they ingest the water. Fish are also very sensitive to ammonia. If ammonia from manure or fertilizer enters water it can kill fish at relatively low concentrations.

Manure can also contain microorganisms that can cause disease in humans. For this reason it is especially important to ensure that manure does not enter directly into recreational waters or drinking water sources through runoff or soil erosion.

Producers should strive to minimize environmental risks associated with using manure as a fertilizer by adopting beneficial management practices for the storage, transport and application of manure.

Livestock manure management is covered in three pieces of Manitoba legislation:

- The Livestock Manure and Mortalities Management Regulation;
- *The Pesticides and Fertilizers Control Act*, and
- *The Farm Practices Protection Act*.

Producers should be familiar with all legislation that could affect the management of their manure. In particular, producers should be aware of the specific restrictions and requirements related to manure application and use in the Livestock Manure and Mortalities Management Regulation (LMMMR), including:

- All manure that is land applied must be as a fertilizer for crop production
- Maximum permissible residual nitrate nitrogen concentrations in soil
- Annual Manure Management Plans for operations 300 AU or greater
- Prohibition on winter application for operations 300 AU or greater (existing operations between 300 and 399 AU have until November 10th, 2010 to comply)
- Setback distances for winter application (specified in Regulation as November 10th to April 10th) for operations with less than 300 animal units and existing operations between 300 and 400 animal units until November 10th, 2010.

As well, under *The Pesticides and Fertilizers Control Act*, custom and off-farm manure applicators must be trained and licensed.

What can you do?

1. Ensure that there is sufficient productive land base to receive manure annually, whether it be your own land or a neighbour's land made accessible through application agreements.
2. Carry out manure nutrient management planning on an annual basis using the best available information including soil and manure analyses and crop records.
3. Apply manure at rates to meet crop needs in a similar fashion as for commercial fertilizers, based on soil tests, laboratory manure analysis, crop type and target yield.
4. Reduce the use of commercial fertilizer based on the estimated available nutrients provided by manure.
5. Consider the following before deciding on the timing and method of manure application:
 - Will nutrient availability be optimized?
 - Will the risk to the environment be minimized?
 - Are the limitations (e.g. steep slopes or coarse textures) and risks (e.g. runoff and leaching) accounted for in applying manure?
6. Meet or exceed the requirements of the LMMMR for livestock manure application to land.
7. Contact your local GO Office for additional information and support, or other appropriate agricultural extension specialist.