

## Manure - The Natural Fertilizer

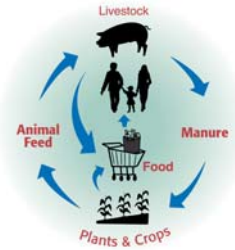
Manure has always been the original fertilizer. As gardeners know, livestock manure provides important natural nutrients and soil conditioners.

Farmers use manure to:

- Improve crop yields
- Add organic matter to improve the soil quality, including water and nutrient holding capacity
- Reduce runoff and soil erosion potential through improved soil structure
- Encourage growth of beneficial soil organisms

The main nutrients in manure are nitrogen (N), phosphorus (P), and potassium (K). Plants need nitrogen for growth, phosphorus for healthy roots, and potassium for protection from wilting, disease, cold and dryness.

Regular manure and soil testing allows farmers to calculate manure application rates to meet crop requirements. Using manure as a fertilizer involves planning manure applications to maximize nutrient utilization and protect the environment. This makes good economic sense.



## Nutrient Management Strategy - An Important Farming Practice

Nutrient management is the science that ensures water quality and soil health are maintained or improved and crop yields are maximized. A nutrient management plan ensures that available nutrients from manure are efficiently utilized as a fertilizer within a cropping rotation.

Intensive livestock operations (ILO) are regulated under the intensive livestock provisions of Saskatchewan's *Agricultural Operations Act, 1995*. The Act is designed to ensure livestock operations develop and operate in a manner that protects surface and groundwater. All intensive livestock operations, regardless of size, are required to ensure that water resources are protected.

Under the Act, an ILO is required to have: a manure storage plan; waste storage and management plan; and a mortalities management plan. The plan consists of the following information:

- Animal inventory
- Confinement period
- Manure production volume
- Nutrient concentration (from literature or manure testing)
- Soil climatic zone
- Land available for manure application
- Average cropping rotation
- Crop nutrient requirements
- Method of manure application
- Application season
- Frequency of application to each parcel of land



## How Close Is Too Close?

Saskatchewan Agriculture, Food and Rural Revitalization identifies the preferred minimum distance separation guidelines (the minimum distance a new barn can be located from a residence). Minimum distance is determined by the number of livestock at a facility, the type of manure storage system and the size of the receptor population.

Preferred Separation Distance (In Metres)						
Animal Units	10-50	50-300	300-500	500-2000	2000-5000	>5000
Rural Residence	300 (450)	300 (450)	400 (600)	800 (1200)	1200 (1600)	1600 (2000)
<100	400 (600)	400 (600)	800 (1200)	1200 (1600)	1600 (2000)	2000 (2400)
100-500	400 (600)	800 (1200)	1200 (1600)	1600 (2000)	2400 (2400)	2400 (2400)
500-5000	800 (1200)	1200 (1600)	1600 (2000)	2400 (2400)	3200 (3200)	3200 (3200)
>5000	800 (1200)	1600 (2000)	2400 (2400)	3200 (3200)	3200 (3200)	3200 (3200)

- Number that equals one animal unit: 1 cow, 3 sows, 100 hens
- Numbers in brackets are preferred for open liquid manure storage.

The above table outlines the minimum recommended separation distances for locating an ILO.

## Manure Management



Sustainable livestock production and nutrient management plans require responsible manure storage and application.

Farmers know the amount of manure their animals will produce, and build engineered manure storages accordingly.

Liquid manure storage facilities must be large enough to hold all the manure that the animals produce in a barn for at least 400 days. This storage capacity allows farmers to store the manure until the time is right to apply it on the land.

Most farmers prefer to use manure injection systems. There are two kinds of injection systems: i) traditional injectors, and ii) low disturbance injectors that allow for no-till or low-till application of manure for crops and forage. Improvements in technology have provided a number of options to the farmer, for example the opportunity for application to no-till land.

## Odour Management

A certain amount of odour is expected from livestock farms. Farmers are making odour control a priority. Many are already using a variety of odour control methods including some that reduce odour at the source, for example:

- To address odour concerns, producers are implementing a number of beneficial management practices that include siting, storing manure and manure application.
- Observing recommended distances from neighbours and taking into account prevailing wind patterns are factors that are considered when choosing a new barn site. (A development permit may be required from the municipality.)
- Location of barns, shelterbelts and well-maintained manure storages help to minimize odour.



- Many farmers cover their manure storages with straw to reduce odour.
- Injecting manure or working it into the soil helps to reduce odours.
- Timing of field application of manure is preferable on cool days, early mornings, midweek, and when prevailing winds are away from neighbours or nearby communities.

## Farmers Follow The Rules



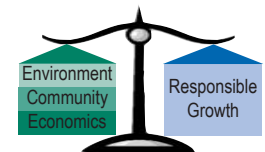
Farmers know that the fundamental roots of agriculture are clean water and healthy soil. Farmers are stewards and have a responsibility to manage their resources with proper regard to the rights of others.

Saskatchewan Agriculture, Food and Rural Revitalization (SAFRR) is responsible for ensuring that intensive livestock operations protect water sources on or near their operations.

ILO applications are made available to the following agencies. These agencies may also have regulatory requirements of the livestock operation:

- Saskatchewan Environment
- Saskatchewan Watershed Authority
- Rural Municipalities
- Saskatchewan Highways & Transportation
- Saskatchewan Government Relations & Aboriginal Affairs

Maintaining natural resources while carrying out a successful agricultural operation requires management that ensures future generations enjoy a healthy and diverse landscape.



## Being Neighbourly

Rural Saskatchewan's hallmark is its strong sense of community. Farmers have long considered neighbours when carrying out necessary agricultural practices. Livestock producers supply inexpensive manure fertilizers for neighbouring farms, and contribute to the community by creating jobs and supporting local events.

Cultivating goodwill and trust in the community is important for successful livestock farming. Farmers do not want to interfere with the lifestyles of their neighbours and readily welcome an opportunity to explain their farming practices. Since farmers raise their families on or near the farm, caring for and protecting the natural environment is a priority.

## Responsible Growth Is The Key

Saskatchewan has abundant available land, low population densities and low livestock numbers relative to the rest of Canada. The combination of available land, clay soils and suitable climate make our province an excellent location for livestock expansion.

Government, industry stakeholders and researchers are working together to sustain responsible livestock production. Saskatchewan's farmers have the resources and expertise required to meet the challenge of producing food for the global economy, while at the same time, protecting the environment, supporting communities and ultimately making a good living.

### Sources

- 1 Prairie Swine Centre Inc., 2000, Pork Production Reference Guide
- 2 Myths and Facts, Ontario Farm Animal Council

### Contact information:

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For information about the *Agricultural Operations Act* and the Agricultural Operations Review Board, contact (306) 787-4680.

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## Tuned Into Public Concerns

The hog industry supports the application of best management practices and continually invests in research that allows it to:

- Better protect surface and ground water
- Reduce nutrient excretions with improved feed management
- Maximize the value of manure as a fertilizer
- Enhance the long term productive health of soils
- Improve in-barn and outdoor air quality
- Provide for the physical and behavioral welfare of the animals
- Enhance animal health and food safety through quality assurance programs that address anti-microbial residues and food borne organisms.



## Water Quality - Important To People and Animals

Watercourses can be natural creeks or streams. Farmers have helped to improve water quality by:

- Reducing soil erosion and agricultural input runoff into waterways
- Improving the handling of fertilizers, manure and pesticides
- Protecting waterways with buffer zones, dedicated areas of land, used to preserve soil and maintain water quality; and windbreaks, rows of trees or shrubs, used to prevent soil erosion and minimize odour.

### Tapping into the Facts

- Canada's renewable fresh water resources are 11 times greater than the United States - 129.2 million litres of fresh water for every Canadian, compared to 11.7 million litres for every American.
- Daily water use per human is estimated at 227 litres per day for all uses.
- A pig uses an average of 7 litres of water per day.<sup>1</sup>
- A mature beef cow uses between 35 to 66 litres of water per day.<sup>2</sup>
- One inch of rain puts 100,000 litres of water on an acre of land.
- Average liquid manure application = 15,000 to 20,000 litres on an acre of land.



## Commitment To Research

Finding new approaches to raising livestock, that not only protects the environment, but also the health of citizens, is important to farmers.

Canadian livestock producers demonstrate their commitment through their support of ongoing environmental and animal health research to maintain the balance between responsible growth and protecting the environment.

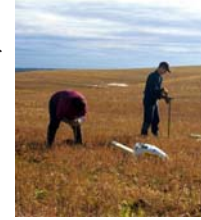
Saskatchewan pork producers have contributed more than \$1.3 million towards environmental research since 1998. In 1999 the Saskatchewan pork industry also established a Research Chair in Environmental Engineering for the Livestock Industry located at the U of S.

Saskatchewan has become an established centre of excellence for swine research through the collaborative work undertaken by the following world class research organizations in our province:

- Prairie Swine Centre Inc., Floral and Elstow, SK.
- The University of Saskatchewan, Saskatoon, SK.
- Prairie Agricultural Machinery Institute, Humboldt, SK
- The Vaccine and Infectious Disease Organization (VIDO) Saskatoon, SK.

For a complete list of swine research projects funded by Saskatchewan producers, visit [www.saskpork.com](http://www.saskpork.com)

Check out the largest on-line public research database on environmental agricultural practices in North America at [www.prairieswine.com](http://www.prairieswine.com)



## Sask Producers Lead By Example

Farmers are recognized as world leaders in environmental management through practices such as returning nutrients and organic matter to the soil, improving water quality, and minimizing pesticide use.

In the last decade, Canadian farmers have made significant environmental improvements through the development and application of new technologies and environmental management standards.

In April 2004, the Canadian Standards Association released two voluntary standards for hog operations; *Environmental Management Systems for Hog Operations: (i) Requirements; ii) Implementation Guide*. The standards were developed by a technical committee made up of stakeholders, producers, environmental organizations and government officials.



Feeding the world's growing population continues to place enormous demands on today's farmers. The reality is that less than 3% of Canadians farm today.

The success of any farming operation is dependent on many factors such as available land, water, access to feed and distance to market.

The Saskatchewan hog industry is regulated by provincial acts, municipal bylaws and guidelines established to ensure sustainable livestock production. Maintaining the balance between the land, animals and the environment is crucial to producers. Their businesses depend on it.

This resource is designed to answer some common questions about livestock and the environment.

## Did you know . . .

- Canada has a rich land base with 168 million acres of farm land: approximately 2/3 suitable for growing crops, and 1/3 suitable for grazing livestock.
- Saskatchewan's land base represents 44% of Canada's farmed land.
- Today's farms, though larger than in the past, are still operated with the same core values and commitment of past generations. 98% of Canadian farms are family owned, and work together to grow crops and raise livestock.
- Two counties in North Carolina produce more hogs than all of Canada.

County or Region	Pig Densities/Acre
Saskatchewan <sup>3</sup>	0.03
China <sup>1</sup>	1.31
Denmark <sup>1</sup>	2.29
Iowa <sup>2</sup>	0.56
North Carolina <sup>2</sup>	1.71

Source: 2003, Saskatchewan Agriculture Food and Rural Revitalization, Statistics Canada

- (1) Arable Land under FAO (2001)
- (2) Arable Land under USDA (1997)
- (3) Arable Land under Stats Canada (2001)