



# The Dirt on

# Pigs

# and the Environment



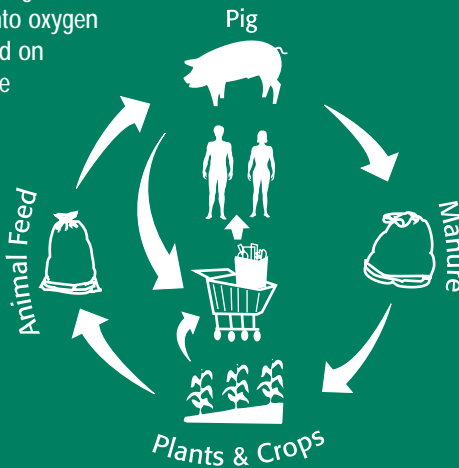
## WHO CARES ABOUT THE ENVIRONMENT?

Recycling, road clean ups, tree planting, and river restoration projects are great examples of people showing their commitment for the environment. What about farmers?

Farmers have always depended on Mother Nature, whether it's waiting for rain to help a crop grow or planting trees and plants to prevent soil loss. **Farmers are the original environmentalists: their land, animals, and businesses depend on it.**

## The Pig Picture: Plants, Animals and the Environment

Plants and animals and people need to work together to live. All farmers, whether they have crops or animals, or both depend on the environment for success. Plants need good quality soil, nutrients, and the right mix of sun and rain and temperatures to grow. Plants absorb air pollutants and gases, like carbon dioxide, through their leaves and roots and convert them into oxygen and fresh air. Animals depend on the plants for food and provide manure to fertilize the next crop and the cycle continues. It's called the **nutrient cycle**. What about people? We depend on plants and animals for food, and plants for fresh air too!



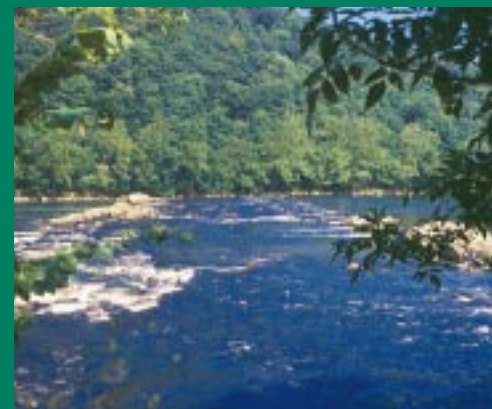
## Pigtionary for the Environment

- **Fertilizer:** any natural or synthetic material added to soil to supply plants with essential nutrients
- **Organic Matter:** dead plant or animal material
- **Livestock unit:** measure used to compare odour produced by different animals; {Example: 1 livestock unit = 1 cow = 4 market hogs = 5 sows = 20 feeder pigs}
- **Nutrient:** any chemical element or compound essential to the growth and development of an organism
- **Nutrient Management:** Match the nutrients in manure and fertilizer to what crops require in an environmentally friendly way.
- **N,P,K:** Nitrogen, phosphorous and potassium; the three major nutrients in manure.

## Water Works

All living things need water. Did you know the average Canadian uses **326 litres** of water a day for regular household and garden use.<sup>2</sup> Everyone plays a role in keeping our water clean and safe to drink and swim in.

The average pig uses approximately **seven litres** of water each day <sup>2</sup>. You use eight litres of water to brush your teeth if you leave the tap running.<sup>3</sup> It's difficult to compare pigs and people, since pigs don't take showers or water their lawn! The important thing to remember is that water isn't lost, but is recycled as nature intended in the water cycle. Preserving ground and surface water quality is a top priority.





## Manure: A Vitamin Pill for Plants

Manure is the original fertilizer. Think about buffalo herds roaming the ranges many years ago, like portable "fertilizer units" dropping manure on the prairies as they grazed. Today many people put manure on their gardens. Did you ever wonder why? Our guess is no, but we're going to tell you!

Manure helps to build up soil with **organic matter**, which helps hold water and nutrients. Manure provides some of the **nutrients**, which plants and many helpful soil organisms need to grow. We get our nutrients from food, and plants get nutrients from the soil and sun.

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

The next time you see a bag of fertilizer in the store, check for three numbers (like 21-7-7). Those numbers stand for the amount of N, P, and K in that fertilizer. Now you know! Farmers can send manure samples to be tested in a laboratory to find out exactly what nutrients are in their manure.

Manure is spread at the rate of approximately 335 hectolitres (hl) of manure per hectare (or 3000 gallons/acre), which is equivalent to less than 4 mm of rainfall over the size of approximately 60% of a football field.

## Soil Testing: An important exam!

We learn the nutrient values of our food by reading the label. Look on a cereal box to see the nutrient amounts (calories, vitamins, fibre, etc.). Farmers can't read a label on their field, but they can send a soil sample to a laboratory for a nutrient test. The soil tests show how much N-P-K are already in the soil, and how much would be needed to fertilize a certain crop. If there are not enough or too many nutrients in the soil, the plants will not grow properly.

## Nutrient Manage What?

So now that we know what nutrients are in the soil and our manure, what's next? Farmers match their manure and fertilizer nutrients with what their crops need in an environmentally friendly way. This is called **Nutrient Management**. Farmers record their information in a Manure or Nutrient Management Plan, which might include:

- manure storage sizes
- manure application dates and weather conditions
- amount of manure applied
- environmental risk identification
- contingency plans (what to do if something goes wrong).

## Every Day is Earth Day on the Farm



The average pig produces 3.5 litres of manure each day<sup>2</sup>. Some barns have solid floors and use straw bedding to help absorb manure and liquids. Many barns have floors with spaces (slatted floors) that allow the manure to fall through and into a manure storage below. Manure storages can be earthen or made of concrete. Concrete storages can be built under the barn or located nearby. The size of the manure storage is built according to the number of pigs that will live in the barn. The manure storage should be large enough to hold all the manure that the pigs in that barn will produce for up to eight months.

*Why would farmers build a storage that holds eight months of manure?* The best time to spread manure is when the plants need nutrients the most. Farms should have enough storage to keep manure over the winter so they can spread it when it's needed and at the most environmentally friendly time.



Many barns have slatted floors. Manure and water fall through and into the storage below.

Manure pits hold more than just manure. You may find this surprising, but when pigs drink they are not always neat! Some water spills into the manure pits below. Farmers work hard to clean their barns to reduce odours and keep their pigs healthy. Pens are washed before any new pigs are moved in. Wash water also ends up in the manure storage, which makes the total of manure and water an average of seven (7) litres per pig per day<sup>2</sup>.



Farmers use computer programs and workbooks to record their soil, crop, and manure management information.

## Manure: To the Fields!

Manure can be put on the land in many ways. It can be injected into the soil, worked into the soil, or put on top of the land. Farmers decide how to spread their manure based on their soil and land, time of the year, and the type of crop they plan to grow. Farmers try to apply the manure in a way that gets the most nutrients to the plants, while keeping the smell to a minimum.



This equipment is so advanced, it can take a satellite image grid-map of a field and apply exactly the amount of manure that's needed in each section of the field. Some parts of a field may have soil that is already rich in nutrients and doesn't require any manure; other parts of the field may require more fertilizer. Manure tankers and equipment are constantly being updated and changed to add in new features to make manure application more accurate, with less smell or risk for the environment.



## What about risk?

The goal of applying manure accurately is to make sure it stays where the plants need it. If more manure is applied than needed, it could drain through soil to enter waterways, which causes rapid algae growth (called an algae bloom). If a large amount of manure enters a stream, it could temporarily make the watercourse toxic for fish from too much ammonia. Farmers try to be careful when applying manure, but sometimes accidents happen or Mother Nature sends unexpected rain. It's most important to prevent manure from entering a waterway, but if it happens contingency plans explain how to clean up a spill right away for the least damage.

Canadian farm practices are subject to a variety of federal, provincial and municipal laws, on topics such as: water and environmental protection, normal farm practices, and land use planning. If a farmer is guilty of contaminating a water source, they can be charged just like anyone else.



Today's farmers try to use conservation farming practices. Leaving crop residue or stubble like this on a field helps preserve and build the soil.

## Research

Believe it or not, a lot of scientists study manure. For example, one researcher is using the bacteria in swine manure to control plant diseases, like scabs on potatoes. Other researchers are developing precise manure application techniques, studying the effect of manure on the environment, and trying to figure out what makes manure smell. The Prairie Swine Centre has a resource centre for agricultural environmental information. Check it out at: [www.prairieswine.com](http://www.prairieswine.com).



## Manure by any other name would smell just as sweet ... or would it?

If beauty is in the eye of the beholder, smell must be in the nose of the sniffer! Smell is always a personal opinion. City people drive to the country and say, 'smell that fresh country air!' The exact opposite happens when country people drive into the city and say, 'smell that city air!'

Odours are most often noticed during collection, stirring, transportation, or spreading manure on the land. While some smells are expected from a farm, farmers know that reducing odour is always a good thing. A lot of time and money is invested in research to find out how and why manure smells, and how to reduce odours.

Farmers are reducing odours in many ways, including: keeping barns clean, feeding pigs differently, covering manure storages, adding biological ingredients to manure storages that 'eat' odours, and working manure into the soil to reduce its airtime exposure.

## What about E.coli ?

All mammals, including people, regularly excrete E.coli in their manure. It's a particular strain that caused the tragedy in Walkerton, Ontario called E.coli O157:H7. Pigs are not common carriers of E.coli O157:H7. Researchers are looking at ways to reduce and prevent harmful strains of bacteria, including animal vaccines.

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# WHAT'S UP WITH FARMERS AND THE ENVIRONMENT?

Farmers, like everyone, are more aware of environmental issues today than in the past. A blue box for recycling wasn't even thought of 20 years ago. Today it's a regular part of our routines. Canada's farmers are world leaders in implementing proactive, on-farm environmental programs. **Here are a few examples:**

## A+: Report Card for Farms

In Ontario over 40,000 farmers have evaluated their farm practices with an Environmental Farm Plan. Farmers mark strengths and weaknesses on their farms, and make action plans for environmental improvements. Other provinces are adopting similar programs.

## Best and Beneficial Management Practices

Farming is a perfect combination of science, practical experience and common sense. There are many books and educational programs available for farmers on environmental stewardship practices such as preserving water quality, restoring streams, and reducing odours.



Farmers help keep waterways healthy by maintaining plants and trees along the banks. This is called a buffer strip which prevents soil erosion.

## Bigger Farms

Like other businesses, today's farms are larger than in the past. As farmers specialize in pigs, they invest in technology, equipment and environmental improvements. All farms, regardless of size, depend on a healthy environment for success.

Today's farms are operated with the same care, commitment and values of the generations that farmed before us. Over 98% of Canada's farms are family operated.<sup>1</sup>



Farmers take their responsibility seriously and treat the land and water with respect. Don't forget, farmers and their families are affected directly by their own farm's activities; they live and work on the land, and drink the water too. It is in everyone's best interest to preserve resources for the farmers of the future.

## Farmers and Rural Communities

Raising hogs is more than a full-time job for most farmers. They are building their homes, their businesses and raising their families in rural communities across Canada. Farmers are and always have been an important part of and a tremendous asset to rural communities. Successful hog producers work hard to:

- produce safe, wholesome, high quality pork
- stay current with the latest in farming practices
- add value to their communities
- communicate openly about their farming operations
- employ local people and support local businesses
- protect the environment
- listen and understand the concerns of their neighbours and act on public input
- follow a code of practice for caring for their animals
- implement Best Management Practices for many aspects of their farming operation

1. *Statistics Canada, Agriculture Census, 1996.*
2. *Fleming, R., Hocking, D., MacAlpine, M., and Johnston, J., 1999. Investigation of manure production in typical 3-site hog facilities.*
3. *Environment Canada, 2000.*

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