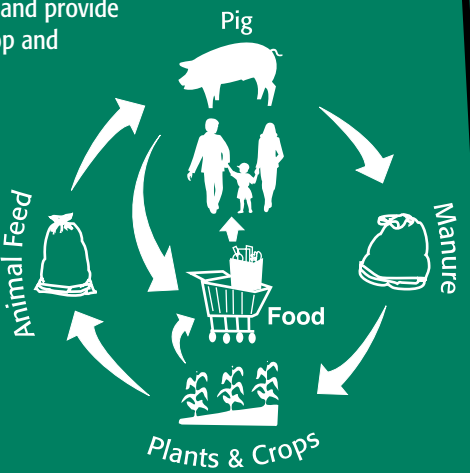
The Dirt on Pigs and the Environment

WHO CARES ABOUT THE ENVIRONMENT?

Recycling our garbage, planting trees, and cleaning up rivers and roads are all great examples of people showing they care for our environment. What about farmers? Farmers have always depended on Mother Nature. **Farmers are the original environmentalists: their land, animals and businesses depend on it.** Let's find out more!

The Pig Picture: Plants, Animals and the Environment

Plants and animals and people need to work together to live. All farmers 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:** decomposed plant or animal material that builds up the soil
- **Animal Unit:** measure used for livestock manure to compare it to the value of fertilizer for a field
  One animal unit = number of animals required to produce 73 kilograms of nitrogen per year as manure fertilizer
- **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 **343 litres** of water a day in our homes and gardens? [2]

The average pig uses approximately **seven litres** of water each day [1]. You use **eight litres** of water to wash your hands with the tap running.[2] 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. Keeping water pure and clean is very important for farmers - they want to be sure their families and animals have good water to drink too!

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.

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 it.

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 nutrients and calories. 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 is 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 Management Plan, which includes:

- type of manure storage and sizes
- manure application locations, methods and dates
- amount and type 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[1]. Some barns have solid floors and use straw bedding to help absorb manure and liquids. Many barns have floors that allow the manure to fall through and into a manure storage below. Manure storages can be earthen, specially treated metal 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 must be large enough to hold all the manure that the pigs in that barn will produce until such time as the manure can be applied as a fertilizer.

Manure is stored in here!

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.

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. Floors, pens and walls are pressure washed and disinfected between each group of pigs. 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[1].

Manure and water fall through these slatted floors into a storage below

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 soil. 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.

Manure is being injected into the soil

This equipment is really 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 equipment is always being updated with new features to make it more accurate with less smell or risk for the environment.

Did you know manure is spread at the rate of 335 hectolitres per hectare (3000 gallons per acre)? That's equal to 4 mm of rain over 60% of a football field. If you placed a pie plate right side up on a field when the manure was being applied, it would get filled with about 4 mm of manure (that's four dimes high!).

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 planning. Vegetation buffer strips and prohibiting manure spreading on the edge of rivers, lakes and drains will protect water quality. If a farmer is guilty of contaminating a water source, they can be fined or 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.

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, planting shelterbelts and working manure into the soil to reduce its airtime exposure.

What about E.coli ?

All mammals, including people, have E.coli in their manure. It's a particular strain of bacteria called E.coli 0157:H7 that can make people sick from drinking water. Pigs are not common carriers of this type of E.coli. Researchers are looking at ways to prevent and reduce these harmful strains of bacteria, including animal vaccines.

Manitoba hog farmers obey strict environmental regulations enforced by government. The Ministry of Health safeguards against communicable diseases through public health promotion, protection and testing. Ministry of Conservation regulations protect the quality of our air, water and soil. It monitors and enforces activities on farms, industries and water treatment plants in our towns and rural septic systems.

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

WHAT'S UP WITH FARMERS AND THE ENVIRONMENT?

Everyone is more aware of environmental issues today than ever, including farmers! Recycling our garbage was hardly even thought of 20 years ago, and today it's what we do every day. Canada's farmers lead the world with their environmental programs. Here are a few examples:

Best 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.

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. Finding new and better ways to protect the environment is important to farmers. Farmers invest a lot of money in scientific research to help find answers. Check out www.praireswine.com or www.manure.mb.ca to see a database of environmental research.

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 rural communities.

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.

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 today and for the farmers of the future.

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1. *Fleming, R., Hocking, D., MacAlpine, M., and Johnston, J., 1999. Investigation of manure production in typical 3-site hog facilities.*
2. *Environment Canada, 2003.*

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