

WATER MANAGEMENT

Protecting water is essential for **sustainable agriculture** – the ability to produce safe, healthy food now and in the future. Sustainable agriculture emphasizes the need to meet growing demands for food production while protecting the natural resources on which the world depends.

Agriculture depends on water

Farmers everywhere need an adequate supply of good quality water to grow crops and raise animals. Safe, reliable water supplies are necessary for crop production, livestock watering, cleaning and processing operations, as well as domestic and drinking uses on farms.¹ Farmers and ranchers take steps to protect water.

Crops depend on water for plant growth and metabolism. Plant roots absorb a small amount of water and the remainder is carried from the roots to the leaves where it changes into vapour and released into the atmosphere. This is called **transpiration**.

Beef cattle watered using a solar-powered pump

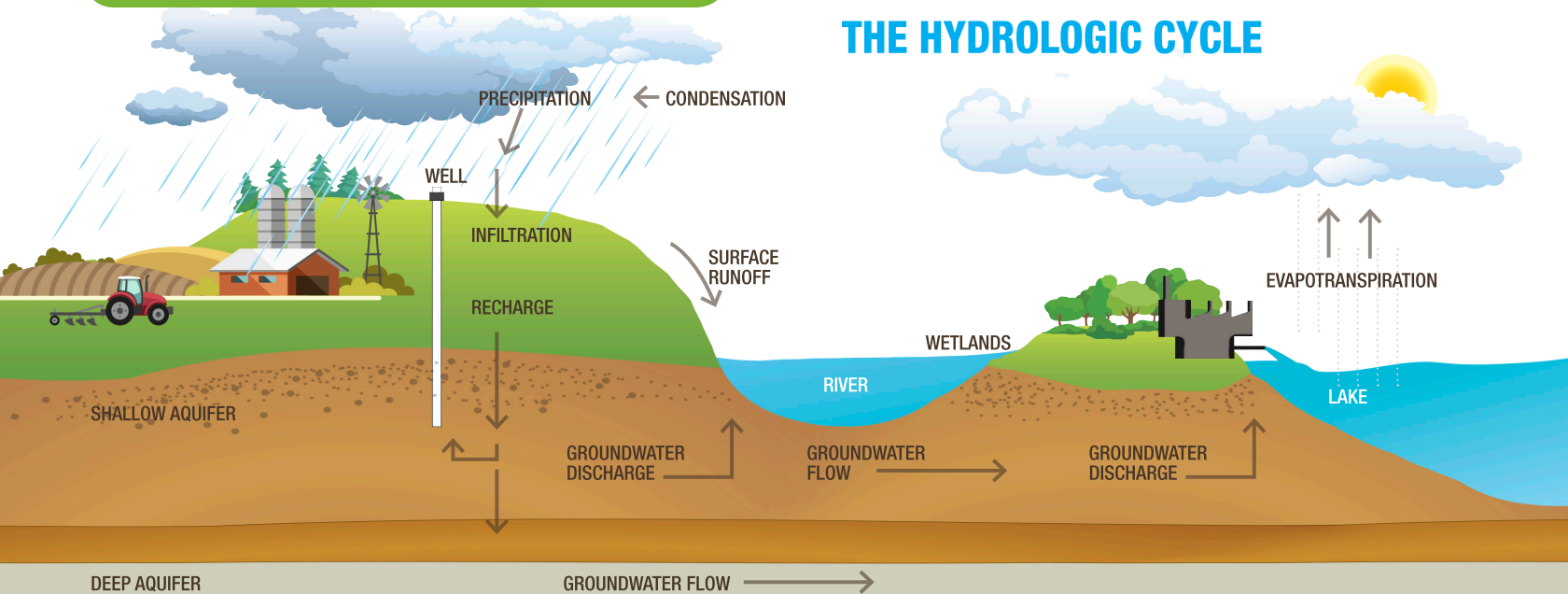


WHERE WATER COMES FROM

Water is continuously in motion. The same water molecules are transferred time and time again from oceans and land surfaces into the atmosphere by evaporation, dropped on land as precipitation (rain or snow), and transferred back to oceans by rivers and groundwater. This endless circulation is known as the **hydrologic cycle** or **water cycle**.²

Agriculture works with all parts of the water cycle. Farmers rely on precipitation to grow their crops. They use groundwater and surface water for livestock watering, drinking water and other purposes. They also move around surface water through irrigation and drainage.

THE HYDROLOGIC CYCLE



WATER USE ON THE FARM

Farmers and ranchers know it's important to use water wisely and maintain water quality. Poor water quality can adversely affect soil quality, crop productivity and food safety.

If applied incorrectly, excess nutrients can run off into waterways. Plant nutrients, such as nitrogen and phosphorus, that leave the field through surface runoff can result in **eutrophication** (depletion of oxygen) in lakes and ponds, contamination of drinking water for humans and livestock, and deaths of fish and other aquatic organisms. Livestock manure used as organic fertilizer can carry bacteria, viruses and parasites that transmit disease.

Many farmers have both nutrient and water management plans to protect water quality and water resources on their farms. Farmers try to ensure that fertilizer is applied to match the needs of their crops and minimize the amount that is lost to the environment.

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WATER SOURCES



One source of water is surface water. This is the water that runs off the land in the forms of rain and melting snow. Many farmers make **dugouts** to store surface water. This is a hole dug in the ground to catch rain and snow. Dugouts provide water for household use, livestock watering and crop spraying.

Farmers also rely on **wells**. Wells draw water from groundwater for use on the farm.

CONSERVING AND RECYCLING WATER

Farmers try to make the best use of available water. This means managing water by conserving it, as well as by recycling. Examples:

- growing varieties of crops that require less water and are resistant to drought
- using conservation tillage whereby fields are minimally tilled or not tilled at all, and stubble is left on fields to help soil retain moisture for crops
- planting trees around dugouts to help capture snow
- ensuring natural water sources and the areas directly around them are left undisturbed to prevent damage to aquatic ecosystems and wildlife habitats

Using mechanical watering systems such as irrigation during appropriate times of the day to reduce evaporation



The importance of water drainage

Sometimes, if it rains too much, farmers have to drain water off their fields. Crops need water to grow, but the presence of too much water affects crop and soil quality. Proper drainage is essential to prevent run-off of chemicals from fields and manure from animal pens that can contaminate groundwater and nearby waterways. Water drainage is also important for controlling flooding and soil erosion.

Many provinces in Canada have legislation regarding land drainage. There are also government programs available to assist farmers with developing drainage plans.



Farmer checking irrigation system

BRINGING THE WATER TO THE FARM



Farmers sometimes bring in water by pipes or ditches from lakes, rivers, on-farm surfaces or groundwater sources in order to water crops by using **irrigation**.

