

THE BARN AND OTHER FARM BUILDINGS

The water you use around farm buildings can directly affect the quality and quantity of your water supply.

Nearly 34,500 Ontario farms water livestock. This accounts for 57% of agricultural well water use. Other typical uses around farm buildings include:

- ▶ barn and milking equipment washing
- ▶ chemical mixing
- ▶ greenhouse irrigation.

Keeping surface and ground water clean is beneficial to:

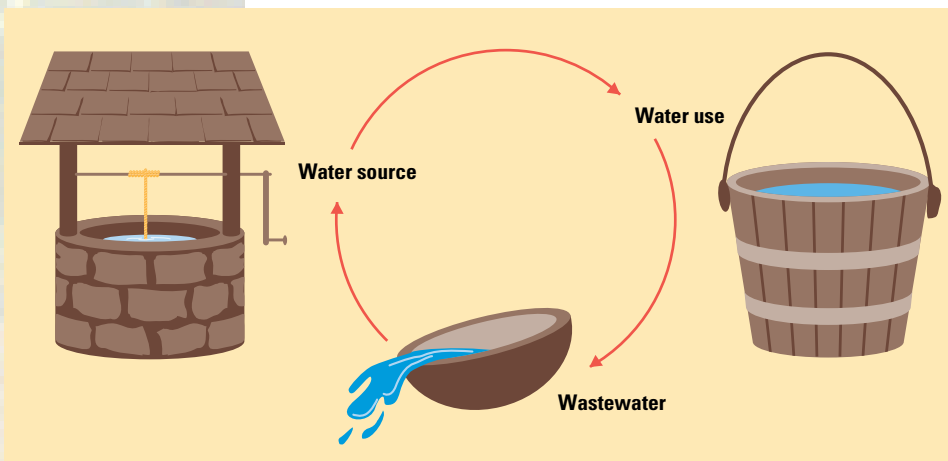
- ▶ family health
- ▶ livestock health
- ▶ neighbours, community, and all downstream water users
- ▶ aquatic environment and wildlife
- ▶ public perception of agriculture
- ▶ your bottom line: nutrients and pesticides are most cost-effective when they remain on their target crop.

You should expect the same regard for water protection from other water users.

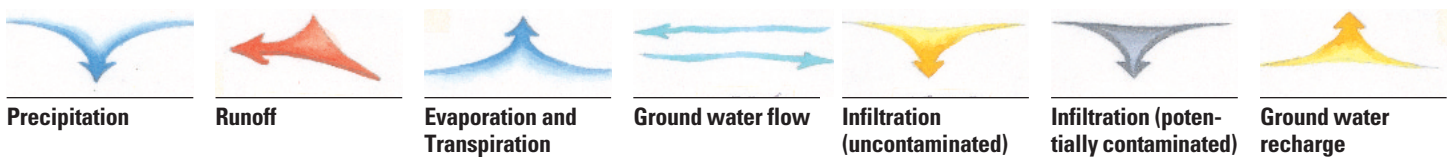
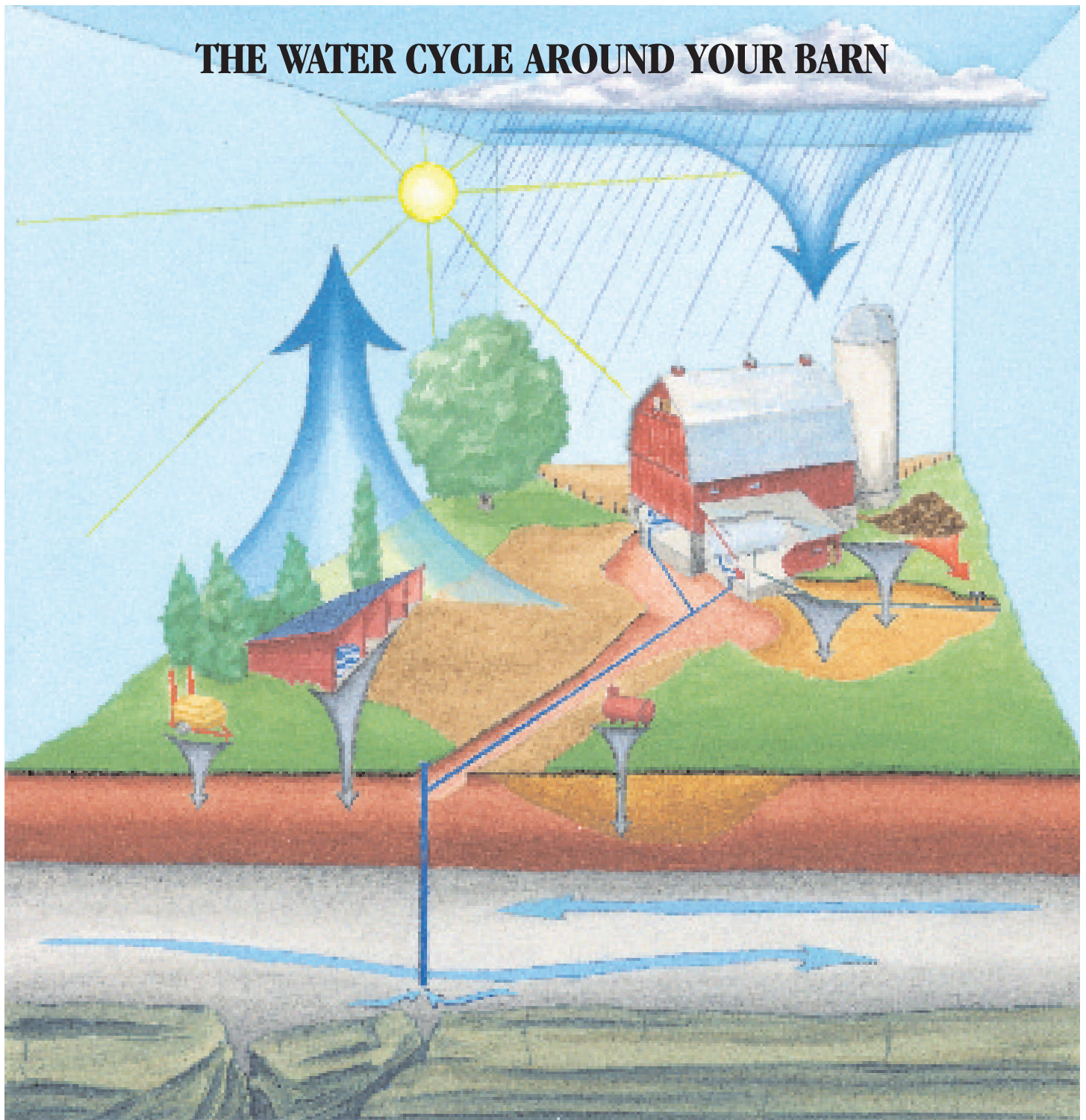
PATHWAYS OF WATER

The components of your farmyard – buildings, feedlots, laneways, and concrete areas – significantly alter the natural pathways of water. Your farmyard has great potential to impact your water supply because it very likely contains the most concentrated area of contaminants.

Look at how water is used and disposed of around your farm buildings. This is the best way to determine how your operation affects the water cycle.



THE WATER CYCLE AROUND YOUR BARN



Like the home, the water cycle around the barnyard is concentrated in a relatively small area. It's especially important here to control contaminated runoff. Any contaminants picked up by runoff around the farmyard can directly pollute ground water. Potential contaminants include many farm inputs stored here, such as fertilizers, pesticides, fuels, manure, etc. Surface runoff potential is increased due to the

number of compacted soil and concrete areas (laneways, feedlots, etc.). Runoff can flow overland to surface bodies of water, such as drainage ditches, or to catch basins and tile drainage systems. Precipitation can also infiltrate soil in concentrated areas, such as sandy/gravelly soils around buildings. Best management practices store potential contaminants safely, and divert contaminated water from water sources.

THE BARN AND OTHER FARM BUILDINGS

WATER SOURCE



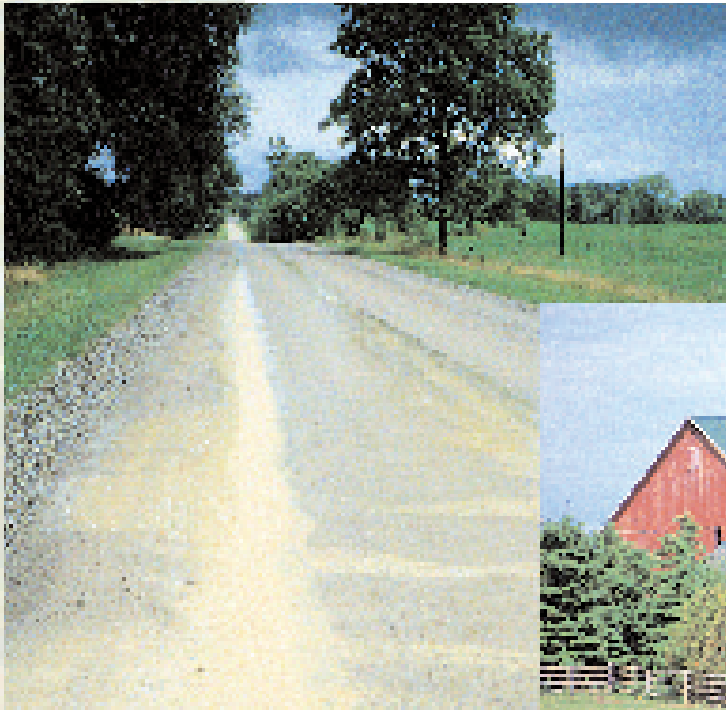
WATER SOURCES

Over 80% of the water used in and around farm buildings is supplied by ground water through the farm well. Generally, ground water is of more consistent temperature, quality, and supply than the surface water of farm ponds, streams, and rivers.

Another water source around your farm buildings is precipitation. This clean water should be diverted from the farmyard before it picks up contaminants from areas such as a barnyard or feedlot.

Roofing, eavestroughs, and water diversions around the farmyard will reduce the amount of contaminated liquids that will run off overland.

Once precipitation lands, its path is determined by ground cover, ground compaction, natural drainage, and the amount of precipitation.



Compacted soil and concrete areas increase surface runoff and prevent uniform seepage to ground water. Proper management of this surface runoff will lessen the transport of contaminants to streams or ground water.



Treed and grassed areas around farm buildings help to filter out contaminants in runoff water.

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WATER USE

Ground water is accessed by the well to service livestock, greenhouse irrigation, milkhouse and barn cleanup, and sprayer filling. This may be the same well that supplies the family with water for drinking, cooking and washing.

AVERAGE DAILY WATER USE	LITRES PER DAY
milking cow	90
beef cow or dry cow	45
dairy heifer	30
horse	42
hog	7
sheep	7
100 hens and pullets (<20 weeks)	20
100 hens and pullets (20 weeks)	27
100 turkeys	50
milkhouse wash	500-1500
1-cm (0.4-in) hose with nozzle	900 L/hour
2-cm (0.8-in) hose with nozzle	1400 L/hour
family member (kitchen, laundry, bath)	350
dairy operation with 40 milkers	6000

(Data supplied by *Farm Water Supply*, Publication 476.)

Water efficiency in your operation will help to prevent water shortages. It will also reduce your energy bills and wastewater volume.

WATER USE

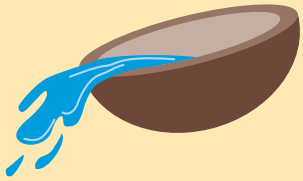


The months of June, July, and August have less than 12% of Ontario's annual streamflow, yet 51% of agricultural water use.

A dairy farmer in Oxford County helped develop and install an innovative water-efficient sink in his milkhouse and reduced total washwater use by 51%, saving \$216 per year on his water-heater electricity bill and \$288 per year on cleaning chemicals. The retail cost of the sink was \$470.

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WASTEWATER



WASTEWATER

Wastewater carries contaminants. Preventing contaminants from reaching your wastewater, rainfall, or snowmelt will reduce risks to ground and surface water.



It's important to prevent contaminated water from entering streams through overland flow to a catch basin or drainage ditch, or through a direct connection to tile drainage.



Ponded, contaminated water on low, coarse-textured land, or on shallow, fractured bedrock, poses a high risk of polluting ground water.

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The following sources can contaminate your ground water. Remember that most wastewater associated with these sources will move through the water cycle and return to the water source (ground or surface water).

SOURCES OF CONTAMINANTS	POTENTIAL CONTAMINANTS	POTENTIAL PATHWAY TO WATER SOURCE
FUEL STORAGE	<ul style="list-style-type: none"> • diesel fuel, gasoline • used engine oil, lubricants • breakdown products (eg. benzene) 	<ul style="list-style-type: none"> • spills, leakages • infiltration to ground water • runoff to surface water
FERTILIZER AND PESTICIDE STORAGE AND HANDLING	<ul style="list-style-type: none"> • chemical products • breakdown products 	<ul style="list-style-type: none"> • backsiphoning into the well or water supply • spills, leakages • infiltration, runoff
MANURE STORAGE	<ul style="list-style-type: none"> • nitrates and other nutrients • bacteria 	<ul style="list-style-type: none"> • storage overflow, spills • runoff, infiltration
SILAGE LEACHATE	<ul style="list-style-type: none"> • nitrates and other nutrients • acids • organic matter, bacteria 	<ul style="list-style-type: none"> • infiltration, runoff, spills
MILKHOUSE WASHWATER	<ul style="list-style-type: none"> • phosphorus, nitrates • chlorine • bacteria • degraded milk solids 	<ul style="list-style-type: none"> • illegal connection to tile drainage • runoff, infiltration
GREENHOUSE WASTES	<ul style="list-style-type: none"> • pesticide products • organic matter • phosphorus, nitrates 	<ul style="list-style-type: none"> • runoff, infiltration
DEADSTOCK AND OTHER HAZARDOUS WASTES	<ul style="list-style-type: none"> • bacteria, disease organisms • medicines • disinfectants • paints, cleaners, oils • batteries 	<ul style="list-style-type: none"> • infiltration, runoff from improper disposal

As water moves overland or infiltrates soil, some filtering action and contaminant breakdown will naturally occur.

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Petroleum products also pose a health risk. Just one litre of oil can render up to 2-million litres of water unfit for drinking.

The potential for a contaminant to harm your water source depends on:

MOBILITY

- some contaminants, such as nitrates, dissolve easily in water and will readily be transported by water to water sources.

PERSISTENCE

- some forms of pesticides will remain in the water supply for many years. (Atrazine and Simazine are examples of herbicides used in Ontario that are particularly persistent in water.)
- many bacteria found in manure or sewage will survive for only up to a couple of months in a water supply. (If fecal bacteria are found in a sample of your well water, it's likely the result of recent contamination.)

TOXICITY

- some contaminants pose a health risk in very small amounts. One example is the mercury in car or disposable batteries. Low levels of mercury that are below detectable limits in streamwater can accumulate in fish.

A water management plan for your farm will help to reduce the risk of harming your own water supply, and protect the water supply of downstream water users.

BEST MANAGEMENT PRACTICES

PESTICIDE STORAGE AND HANDLING

Crop protection chemicals are an important part of many cropping systems in Ontario. By using these efficiently and carefully, you are helping to ensure:

- personal safety
- financial savings
- a safe environment.

Approximately 120 pesticides are licensed for use in Ontario. These are in the form of herbicides, fungicides, nematocides, rodenticides, insecticides, and growth regulators.

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SAFETY CONCERNS

Pesticides, by design, are toxic to plants or animals, and in most cases, insects. If mishandled or misused, they can also be toxic to people.

Those with the greatest risk of harm from accidents or misuse of crop protection chemicals at the farm buildings are:

- the pesticide handler
- the farm family
- other water users, including neighbours, animals, and aquatic life.

The health effects from pesticide contamination depend on the type of chemical and the amount of exposure.

An accidental spill or backsiphoning of a chemical into your well can severely impair drinking water. Immediate health problems can result. There have been few reported cases.

Trace levels of pesticides that seep to your water supply can have delayed effects. The effects of repeated exposure to these low levels of pesticides are unknown, but may produce health problems many years after the exposure.

The following best management practices will help you to store and handle your pesticides safely. And remember that using chemicals as efficiently as possible – through tillage practices, crop rotations, and careful pest monitoring – is a positive step toward ensuring our safe water supplies.

STORAGE

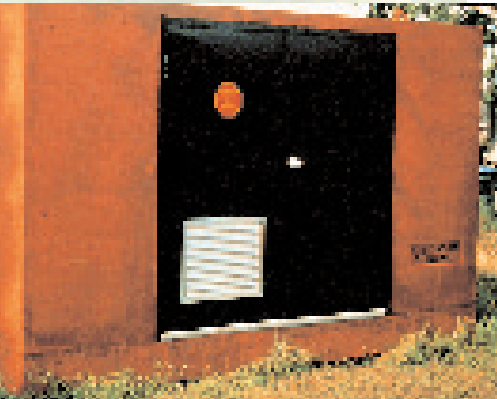
AMOUNT STORED

- minimize the amount of pesticides stored at any one time. (The Ontario Environmental Farm Plan Worksheets recommend less than 20 kilograms or 20 litres.)
- return unopened containers to the supplier
- only store partly used containers on the farm
- use custom applicators
- use line injection systems
- use bulk containers (to minimize the number of containers).

Triazine herbicides are the most commonly reported pesticide contaminants in ground water. Atrazine, for example, can persist for more than a year in the environment and has been found in surface and ground water in many sites in Southern Ontario.

A recent survey of 1300 rural wells found 12% with detectable levels of pesticides. One well exceeded the safe level for the herbicide Metolachlor as a result of a spill at the well.

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Pesticides should be stored in a separate building or room used only for storing pesticides. A separate building is preferred. If the storage is within another building, the interior walls of the storage should have a fire-resistant rating of at least one hour.

STRUCTURE

Pesticides should be stored away from humans, livestock, feed, produce, and clothing. Other considerations include:

- ▶ area should be dry, heated, and insulated to protect the stored chemicals. For small quantities of pesticides stored over winter, an insulated and heated cabinet is adequate.
- ▶ floor should be sealed and curbed to contain any spills or leaks within the storage. There should be no floor drain.
- ▶ area outside of the storage should be well-drained
- ▶ storage should be located as far from any water source as possible. (The Ontario Environmental Farm Plan Worksheets recommend storing pesticides at least 91 metres [300 ft] from a well.)

For personal safety, the storage should contain:

- ▶ a locked door – accessible from outdoors only
- ▶ a “Warning: Chemical Storage” sign on all doors
- ▶ ventilation to the outside
- ▶ original labelled containers
- ▶ posted emergency telephone numbers for the ambulance, doctor, poison control centre, fire department, and Spills Action Centre of the Ontario Ministry of Environment and Energy
- ▶ protective clothing and respiratory equipment readily available
- ▶ an updated list of all stored chemicals.

Before building a storage, check the requirements of the Pesticides Act and the Canadian Farm Building Code.



A pesticide storage should have a Warning sign on all doors.

A pesticide storage should be designed to store chemicals, prevent spillage, and contain spills if they occur. For these reasons, the building should be dry, heated, well-ventilated, and have a curbed floor, locked door, and signs posted.



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MIXING AND LOADING PRACTICES

Here are some tips and considerations:

- ▶ locate the area where you mix and load as far away as is practical from any water source – the Ontario Environmental Farm Plan Worksheets recommend a distance of 91 metres (300 ft) from any well or other water source
- ▶ a mixing/loading area with a curbed concrete pad and runoff containment will contain any spilled chemical or rinsate
- ▶ use a separate water tank as the water supply
- ▶ use an anti-backflow device and/or a 15-centimetre (6-in) air gap above the sprayer tank when drawing water – it will prevent water in the spray tank from draining back into the water source
- ▶ keep constant supervision to ensure there are no overflows
- ▶ follow label directions when mixing and using pesticides
- ▶ wear the proper protective clothing as shown on label directions
- ▶ put a roof/cover over the area to minimize the potential amount of contaminated water you have to deal with
- ▶ any leftover solution should be applied to the same sprayed field. Application should be carried out away from a well or any surface water – the Ontario Environmental Farm Plan Worksheets recommend more than 60 metres (200 ft) from a well and 9 metres (30 ft) from surface water or a tile inlet.

It makes economic and environmental sense to plan ahead and mix the exact amount of spray required for the area. Consider using the line injection systems that mix only what is used.



A chemical mixing/loading area should be designed to contain any spillage.



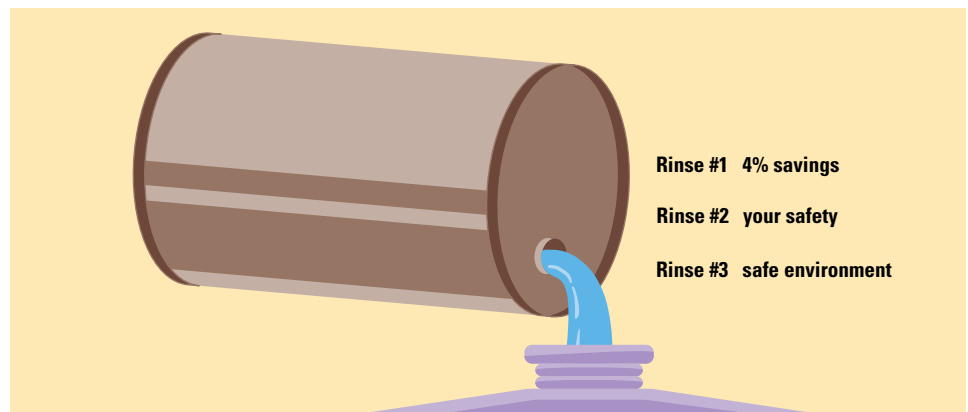
Seventy percent of skin exposure to pesticides is through the hands. Always wear impermeable gloves!

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RINSING

All containers must be triple rinsed or pressure rinsed into a spray tank. This will help prevent water contamination through seepage at disposal sites.

Rinsing also means savings. Between \$2- and \$10-worth of chemical can be in the first rinse of a 10-litre container.



Triple rinse or pressure rinse all pesticide containers into a spray tank. (Taken from *Water in Trust*, Crop Protection Institute.)

Currently, 500,000 small pesticide containers are used by Ontario farmers each year. Many counties now have at least one drop-off location for recycling pesticide containers. Containers must be triple rinsed or jet sprayed. Contact your local Ontario Ministry of Agriculture and Food office for drop-off locations and dates.

Please note: old, unused pesticides cannot be disposed of at these locations. Some household hazardous waste collection sites will take some unused pesticides. Contact your municipality.

CONTAINERS

- ▶ returnable containers and bulk containers should be used where possible
- ▶ punctured, empty pesticide containers should be taken to a recycling depot
- ▶ if the container cannot be recycled or reused, dispose of it at a licensed landfill.

EMERGENCY PLAN

Develop a written emergency plan for accidental exposure and spills. In the event of an emergency, it will help you minimize danger to you and the water supply.

If your well is accidentally contaminated with a pesticide:

- ▶ it must be pumped immediately
- ▶ do not use it until the water is proven safe
- ▶ consult a specialist from the nearest Ontario Ministry of Environment and Energy office for advice on necessary procedures and water testing.

Absorbent material such as dry sawdust, soil, or dry straw should be stored for immediate cleanup of any spills or container leakages to prevent movement to the water supply. This material can then be spread on the sprayed field.

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BEST MANAGEMENT PRACTICES

SILAGE STORAGE

Silage can be made from corn, cereal grains, alfalfa, and canning company wastes such as processed sweet corn waste.

Under good harvesting and storage conditions, silage should be of little risk to your water supply. However, without proper containment, excess silage juices can contaminate ground and surface water. Too much water or pressure in the silo will cause these liquids to seep out.

The liquids from this silage contain high amounts of:

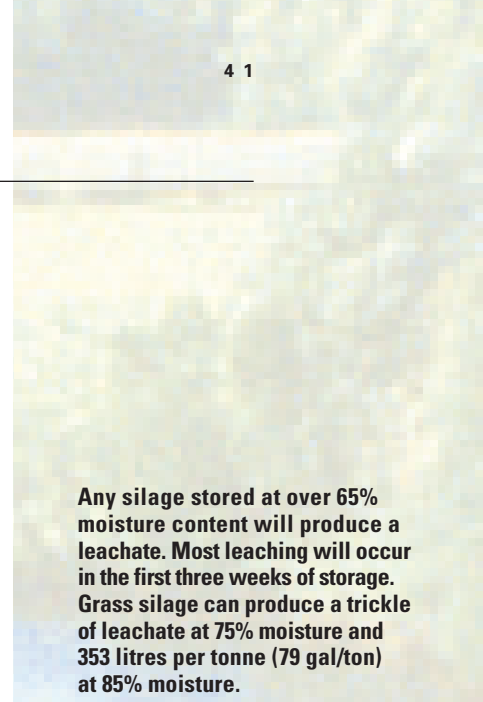
- nitrates
- ammonia
- iron
- acidity
- organic compounds.

These nutrient-rich liquids, if allowed to reach a stream, can decrease the oxygen in the water – affecting fish and other stream life.

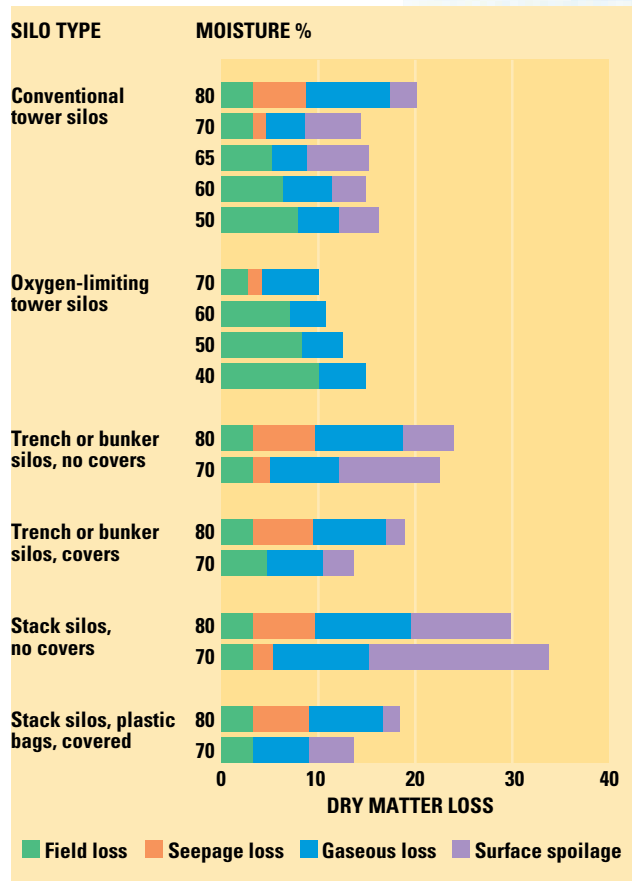
In terms of moisture, silage under 12 metres (40 ft) in depth should have a moisture content below 65%. Above this depth, the moisture content should be below 60%.

STORAGE LOCATION

- store your silage away from any water source, at least 91 metres (300 ft) from a well and at least 152 metres (500 ft) from surface water
- impermeable surface soil (heavy clay) around the storage will help to prevent seepage to ground water.



Any silage stored at over 65% moisture content will produce a leachate. Most leaching will occur in the first three weeks of storage. Grass silage can produce a trickle of leachate at 75% moisture and 353 litres per tonne (79 gal/ton) at 85% moisture.



Estimated silage storage losses

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STRUCTURE

To help prevent seepage from and early deterioration of your storage, the floors, walls, and foundations should have no cracks. Reline the storage when cracks are present.

Excess moisture can seep away, carrying valuable nutrients. Cover storage to prevent unwanted precipitation in the silage.

A seepage collection system should be in place for collection and spreading of the runoff. This may be the same collection and spreading system used for stored manure and barnyard runoff.

Clean water should be diverted away from the storage area to reduce the transport of silage leachate.

To preserve the quality of livestock feed as well as your water supply, keep excess moisture out of the silage.

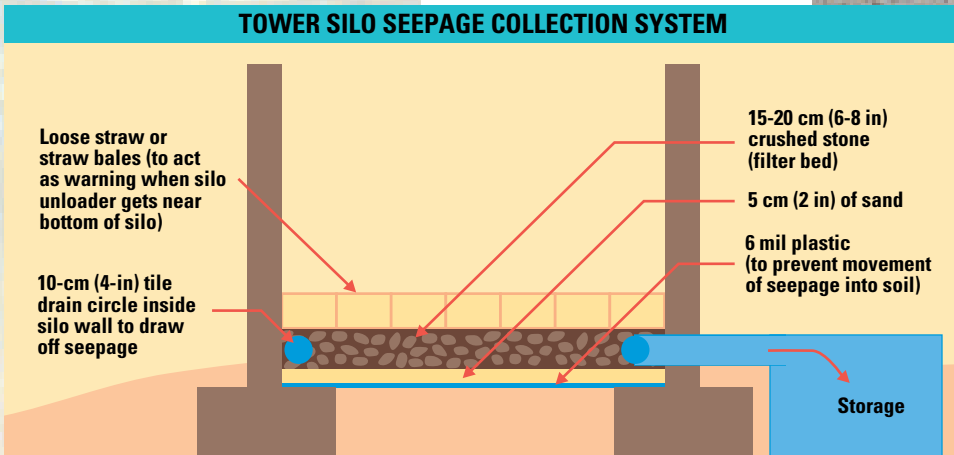


Silage acids will deteriorate the concrete in silos. Both concrete pre-cast stave silos and cast-in-place silos will be affected by acids in silage. Careful inspection, maintenance, and repair are necessary to protect the silo's structural stability.



A horizontal silage storage can be covered with a strong plastic material to maintain quality feed and prevent leachate runoff.

TOWER SILO SEEPAGE COLLECTION SYSTEM



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BEST MANAGEMENT PRACTICES

FUEL STORAGE

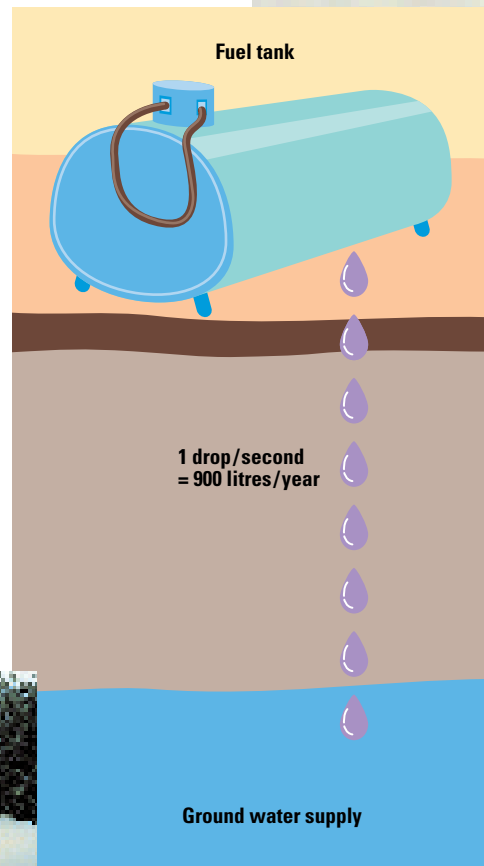
Motor fuel and heating fuel are stored on many rural properties. Leaking storage tanks and fuel spills can pose a great threat to both ground and surface water.

A fuel oil, gasoline, or diesel leakage can move easily through soil to ground water. Once there, it will float on the surface of the water table and will usually not travel far from the leakage site. This can pose a threat to your farm's well water.

As the fuel breaks down, some contaminants may travel in ground water for many kilometres. This can pose a threat to your neighbours' wells and nearby drains, streams, or lakes.

As we noted in "The Home" section, water that seems pure may be contaminated. If you suspect fuel leakage, take a water sample to a private lab to test for fuel products. It's for your family's protection.

Take steps to prevent fuel leaks. It is very difficult and extremely costly to restore ground water contaminated by fuel.



An above-ground fuel tank should be diked and sized to contain 110% of its volume.

A small fuel leak of one drop per second can mean a loss of 900 litres of fuel in a year. Your farm's water supply can be polluted by just a few litres of gasoline in the ground water.

STRUCTURE AND LOCATION

On most rural properties the gasoline and diesel fuel tanks are located above ground. Fuel storage tanks are also located below ground or in a basement, e.g. for home fuel oil.

- all fuel storage tanks must be installed and serviced by a registered contractor.

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ABOVE-GROUND TANKS

Your tank should be steel and covered with a protective coating to prevent rusting, i.e. Underwriters Laboratory Canada (ULC)-approved tanks. Here are additional considerations:

- ▶ locate an above-ground tank far enough away from buildings to create a fire break – must be at least 3 metres (10 ft) from any building
- ▶ must be at least 7.5 metres (25 ft) from a source of ignition
- ▶ must be at least 0.9 metres (3 ft) from another fuel tank
- ▶ to protect your water supply, locate the fuel storage at least 91 metres (300 ft) from a well
- ▶ dike the area around the tank to contain spills. The diked area should be sized to contain at least 110% of the tank volume. Rainwater should be removed to maintain the capacity of the diked area. (For more information on what constitutes a dike, see Environmental Farm Plan Worksheets.)
- ▶ make sure the fuel is pumped through the top of the tank, not gravity fed, to prevent fuel leakage. Fuel tanks on stilts or stands are illegal – hoses and nozzles can leak.
- ▶ paint the tank white to reduce evaporation losses.

UNDERGROUND TANKS

An underground fuel tank must be registered and approved by the Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations. Some of the stipulations are:

- ▶ should be located at least 91 metres (300 ft) from a well
- ▶ must be located at least 1 metre (3 ft) from a building
- ▶ must be located at least 0.6 metre (2 ft) from another fuel tank
- ▶ if unused, must be removed according to regulations and reported to the Fuels Safety Branch.

MAINTENANCE AND SAFETY PRECAUTIONS

Regular annual servicing should be done by a registered contractor. Also,

- ▶ for security, the fuel nozzle should be locked when not in use
- ▶ fuel nozzle should automatically shut off either when it's released or the tank is full (ULC-approved nozzles). There should be constant supervision while pumping.
- ▶ rainwater should be removed from diked areas
- ▶ above-ground and underground tanks require inventory control – contact the Fuels Safety Branch, and see the Ontario Environmental Farm Plan Worksheets for more information
- ▶ you must have an emergency plan readily available at storage site
- ▶ check all equipment regularly to ensure that all equipment is in good working order. Hoses, nozzle valves, and fittings should be properly tightened.
- ▶ post Warning signs, and have a fire extinguisher readily available.

Steel underground tanks can last from 15 to 20 years.

For your personal safety and the safety of your water supply, post a Warning on your fuel storage tank.

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BEST MANAGEMENT PRACTICES

FERTILIZER STORAGE AND HANDLING

Common sense when handling and storing fertilizer will do much to protect water supplies and prevent costly losses.

Fertilizers contain nutrients including nitrogen, phosphorus, potassium, and other micronutrients that help to improve or maintain crop yields.

Runoff of these same nutrients can accelerate plant growth in streams.

Spilled fertilizer can leach to ground water and harm your water supply. Nitrate contamination of well water is of particular concern.

In most cases, small amounts of fertilizer are stored on the farm and with proper management should not affect water quality.



Algae and other aquatic plants can clog a stream and deplete its oxygen, thereby harming the stream's aquatic life.

STORAGE

- ▶ store only small amounts of fertilizers for short periods, prior to application
- ▶ make sure containers are clearly labelled and well-maintained with no holes, tears, or punctures
- ▶ restrict access to the storage area
- ▶ protect stored dry fertilizer (bulk or bagged) from the weather. Cover and store on a solid surface such as sealed concrete.
- ▶ contain and store liquid fertilizer on a solid surface with a separate, adequately-sized runoff containment area. This will prevent water contamination if a spill occurs.

MIXING AND LOADING PRACTICES

- ▶ where possible, locate a fertilizer mixing and loading area away from the well. A distance greater than 91 metres (300 ft) is suggested by the Ontario Environmental Farm Plan Worksheets.
- ▶ use an anti-backflow device and/or a 15-centimetre (6-in) air gap above the sprayer tank to prevent any back-siphoning into the water source
- ▶ use a separate water tank for your water supply where possible
- ▶ use a mixing/loading area with a curbed solid pad (such as sealed concrete) and runoff containment to contain any spilled fertilizer.

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CLEANUP, DISPOSAL AND SAFETY



Use a mixing/loading area with a curbed solid pad and runoff containment to contain spilled fertilizer.

Taking the proper safety precautions when handling fertilizers will help prevent unnecessary exposure:

- ▶ clean up any spilled dry fertilizer on the pad. Store it or use it as soon as possible.
- ▶ clean up any fertilizer spill immediately
 - ▷ dry, absorbent material such as sawdust, soil, or straw will help to absorb and contain liquid spills. This material can then be spread on the same field.
- ▶ apply any rinse water from cleaning equipment to the same field
- ▶ application should be more than 61 metres (200 ft) from a well and 9 metres (30 ft) from a surface water source or a tile drain inlet.

BEST MANAGEMENT PRACTICES

GREENHOUSE WASTE

Greenhouse production is very intensive. You need high inputs to generate large amounts of produce in a relatively short period.

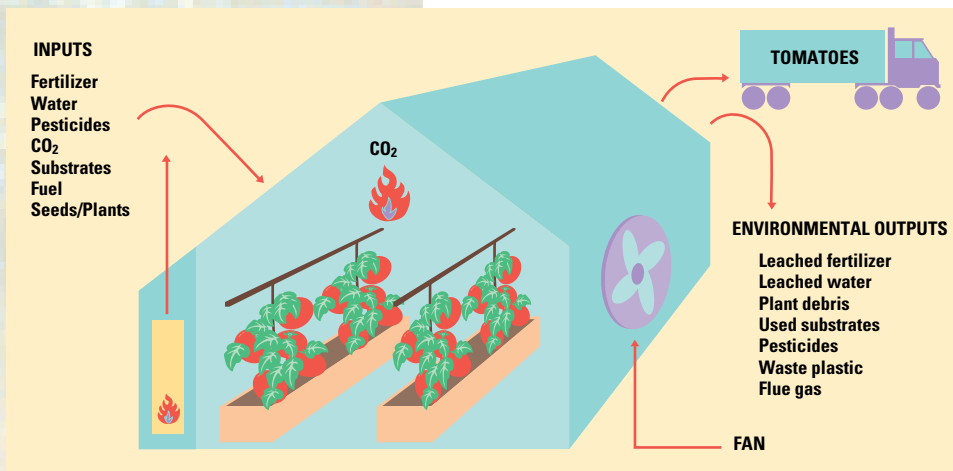
Some greenhouse operations also generate a considerable amount of waste materials.

Potential contaminants to your water supply include:

- ▶ pesticide chemicals
- ▶ fertilizer nutrients
- ▶ substrate waste
- ▶ petroleum products.

You can reduce greenhouse waste through reducing, recycling, and proper disposal to protect ground and surface water supplies.

Refer to the Best Management Practices booklet, *Horticultural Crops*, for practical advice in greenhouse production.



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BEST MANAGEMENT PRACTICES

MANURE STORAGE AND HANDLING

Manure contains valuable nutrients and organic matter that are beneficial to your growing crops. But these same nutrients can be harmful to your water supply. Proper storage and handling of manure will protect water quality and provide valuable crop fertilizer benefits.

Refer to the Best Management Practices booklet, *Livestock and Poultry Waste Management*, for a guide to manure handling, storage, and application on your farm.

BEST MANAGEMENT PRACTICES

MILKHOUSE WASTE MANAGEMENT

Milkhouse washwater may appear harmless, but it can contaminate water with:

- phosphorus
- bacteria
- degraded milk solids
- disease-causing organisms.

For a guide to milkhouse waste management on your farm, refer to the Best Management Practices booklet, *Livestock and Poultry Waste Management*.



Many dairy farmers have installed a treatment/disposal system to prevent milkhouse washwater from directly polluting streams.



Diverting clean water away from stored manure will reduce the amount of contaminated water.



Each Ontario dairy farm produces an average of 35 kilograms of phosphorus annually. High amounts of phosphorus in a stream cause excess algae growth.

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Agriculture is the fourth largest water user in Canada (9%). The first three are: thermal power (60%), manufacturing (19%), and urban use (11%).

A water meter can be installed to measure water use. You can buy it through a plumbing or pump retailer for less than \$100.

BEST MANAGEMENT PRACTICES

FARM WATER EFFICIENCY

Efficient water use means achieving the same or better level of production with less water.

Make water efficiency efforts part of your overall farm plan. Make sure any action you plan is feasible. Common sense remains one of your best resources. Here are some additional tips:

- ▶ monitor water needs, water use, and water waste throughout your operation, and target areas where efficiency can be improved
- ▶ plan your water use to ensure adequate water supplies for your own operation, while taking into account others using the same water source
- ▶ ensure that your water use is not harming the quality or quantity of water for downstream water users
- ▶ understand the legal requirements for water use and obtain any permits required (see page 91 for laws and regulations that affect water use).

USE AND OPERATION

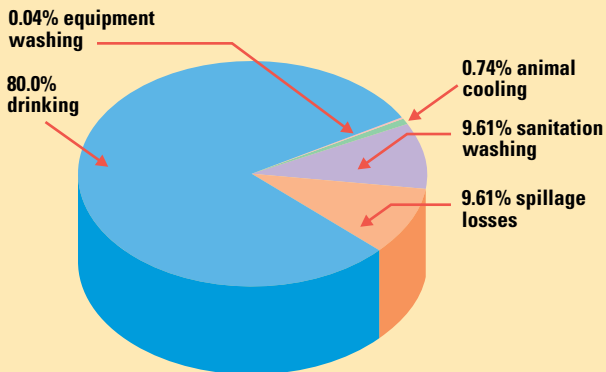
LIVESTOCK DRINKING WATER

- ▶ maintain watering equipment floats and seals to prevent leakage, spillage, or overflows
- ▶ install watering facilities that reduce livestock competition
- ▶ reduce livestock water needs by reducing heat stress in summer months (provide shading, ventilation)

▶ for swine operations:

- ▷ reduce water pressure on nipple waterers to reduce spillage when drinking
- ▷ install modern wet/dry feeding systems for swine. These will reduce wastewater by 30%.

WATER USE FOR A LIVESTOCK OPERATION



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WASHING AND CLEANUP

Milkhouse washwater reduction methods on dairy farms include:

- ▶ feeding the first rinse from the pipeline and bulk tank cleanup to calves
 - ▷ will also help a treatment trench system for washwater disposal function better
- ▶ install a water-conserving sink for equipment washing
 - ▷ saves heating and washing chemical costs
- ▶ install a pressure washer that uses air in the cleaning process
- ▶ use the acid rinse water for floor cleanup.

In swine operations, reduce the need for mist cooling by designing barns that reduce heat stress. Clean the barn with compressed air pressure washers.

IRRIGATION

- ▶ use properly designed and maintained irrigation equipment to prevent losses due to spills or leaks
- ▶ where possible, store rainwater and snowmelt for irrigation during dry periods
- ▶ use fully automated irrigation systems on timers to reduce accidental over-watering
- ▶ recycle excess irrigation water (e.g. greenhouse)
- ▶ time your irrigation to periods when evaporation by the sun will be minimal
- ▶ coordinate with neighbouring water users to prevent water shortages
- ▶ get a Permit to Take Water from the Ontario Ministry of Environment and Energy (see the blue pages of your telephone book) or at your local Conservation Authority.

BEST MANAGEMENT PRACTICES

DEADSTOCK AND OTHER FARM WASTE DISPOSAL

Like most business enterprises, every farm produces some waste material. Many seemingly harmless products can impair a water supply if not properly disposed of. Waste materials include:

- ▶ dead animals
- ▶ contents of a farm dump site
- ▶ livestock medication
- ▶ packaging
- ▶ paints, cleaners, lubricants, oils
- ▶ farm materials and equipment.



A water-conserving sink can reduce milkhouse washwater use by up to 45% and cut hydro costs by 35%.

Use micro-irrigation systems where possible. Drip, trickle, or micro-spray systems use 30 to 60% less than an overhead irrigation system.

Irrigation uses over 98% of the water pumped from a water source for crop production (including sod, nursery, and greenhouse production).

THE BARN AND OTHER FARM BUILDINGS

DEAD ANIMALS

Proper disposal of dead animals is extremely important to protect the health of both people and livestock. An animal carcass can contain harmful bacteria and other disease organisms that can contaminate you or others directly, or through leaching to your water supply.

Deadstock must be disposed of within 48 hours – either buried under 0.6 metres (2 ft) of earth or picked up by a licensed Dead Animal Collector. This is a requirement under the Dead Animal Disposal Act.

Pickup by a licensed collector is the preferred method to prevent any contamination of your water supply by decomposing animals.

Animals that can be picked up by a licensed collector include:

- ▶ production animals (swine, cattle, sheep, horses, goats, poultry)
 - ▷ poultry (chickens, turkeys, ducks, geese) can be temporarily stored in freezers for pickup
- ▶ pets
- ▶ wild animals.

To protect ground and surface water, any burying of deadstock should be done in accordance with the law: away from a well or surface water source and in soils that restrict seepage.

ON-FARM DUMPSITES AND HAZARDOUS WASTE DISPOSAL

Traditionally, many farm wastes were disposed of at a dumpsite on the farm. Depending on the contents, this disposal site can be leaching dangerous contaminants to the ground water.

Farm waste material should be reused or recycled wherever appropriate.

No hazardous substances should be disposed of on the farm. Here are some common farm materials that should be taken to a hazardous waste disposal site:

- ▶ livestock medication and other veterinary products
- ▶ paints, cleaners, lubricants, oils and their containers
- ▶ used motor oil for lubricating equipment
 - ▷ recycle where possible
- ▶ used materials such as insulation, asbestos materials, pressure-treated lumber, and batteries.

