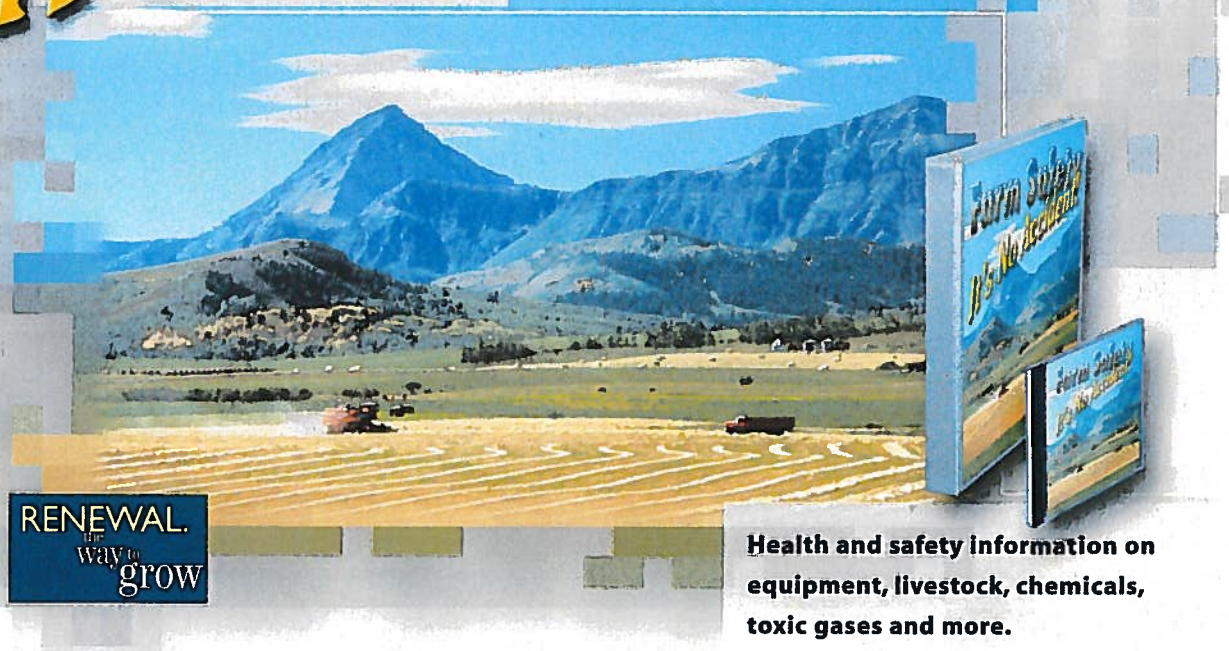
DVD & Manual

Farm Safety

It's No Accident!



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Alberta

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Alberta

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SECTION 6: FARM YARD SAFETY

6.1 Farm Yard Safety—Introduction (Video)

FROM THE VIDEO:

Would you let children play on this work site [a refinery]? Not likely.

And yet, this country farmyard is an "industrial" site too, on a smaller scale—with many of the same hazards.

Since farmers, ranchers and their families live, work and play at their worksite, they're always a stone's throw from potential hazards.

There are plenty of ways to get yourself in trouble. For example: farm fuels are flammable and sometimes explosive. If they're allowed to enter the human body, they cause serious health problems.

Flowing grain in a bin can act the same as quicksand. A person can be pulled under very quickly and suffocated.

Slips and falls often result in serious injuries—from broken arms to concussions.

The usual cause of injuries on your yard—whether it's from the lawn mower or electric shock—is lack of alertness around dangerous situations!

6.2 Top Ways to Prevent Farm Yard Injury

DVD:

Take a few minutes, and scan your yard for hazards!

Do you see:

- Easy entry into dangerous areas (silos, old wells, grain bins, dugouts, manure pits)?
- Fire hazards (unsafe fuel storage, flammable debris inside/outside)?
- Electrical hazards (wiring damaged or not up to Code)?
- Slip or trip fall hazards (debris or slippery conditions where people walk inside/outside)?
- Poor lighting in night work areas?

☑ **Look around your yard. Scan for hazards, and answer the following questions.**

☐ Can people (and animals) easily enter dangerous areas, such as silos, abandoned wells, grain bins, dugouts or manure pits?

☐ Are there fire hazards (unsafe fuel storage, or flammable debris in the yard or in buildings)?

☐ Are there electrical hazards (wiring that is damaged or not up to Code)?

☐ Are there slip/trip fall hazards (debris or slippery conditions in the yard or inside building entrances, walkways or stairways)?

☐ Is there poor lighting in areas where night work is done?

6.3 Farm Fuel Hazards

DVD:

Diesel and gasoline are chemical cocktails (hydrocarbons and chemical additives)!

- Fuels must not enter the human body or the natural environment.
- Inhaling fuel vapours (high concentrations) causes: headaches, dizziness, nausea, impaired judgement, respiratory problems, damage to the central nervous system, unconsciousness.
- Skin contact causes irritation, dermatitis and chemical burns.
- Eye and respiratory tract contact causes moderate irritation (vapours).
- Some fuel components are toxic/carcinogenic. Additives remain after evaporation; avoid accidental swallowing of residue (hands, containers).

What's in Farm Fuels?

Farm fuels such as diesel and gasoline are actually a cocktail of chemicals, containing a variety of hydrocarbons and a mix of chemical additives.

The hydrocarbons are the energy source, and they can release a lot of energy—either inside the engine, or outside in a destructive fire.

The chemical additives reduce "performance" problems like fuel separation, deposits, poor combustion and engine wear.

Some of the components of fuels are quite toxic, and are believed to pose a cancer risk.

Health Hazards

Obviously, these chemical cocktails are designed to power internal combustion engines.

They're not designed to enter the human body or the natural environment. You can be exposed to fuel hazards in a number of ways.

- Exposure to gasoline and diesel can occur by inhalation of vapours, absorption through the skin and accidental ingestion of fuel residue.
- Fuel contact with the skin can cause irritation and dermatitis. Prolonged contact can produce chemical burns.
- Some hydrocarbons and chemical additives can be absorbed through the skin and enter the body.
- Fuel vapours can cause moderate irritation to the eyes and respiratory passages.
- Exposure to high concentrations of fuel vapours can cause headaches, dizziness, nausea, impaired judgement, respiratory problems, damage to the central nervous system and unconsciousness.

6.3.1 Fuel Handling

DVD (1 of 2):

Dangers when transferring fuel:

- Fire and explosion
- Spills onto your body
- Spills into the environment

Reduce fire hazards!

- Transfer fuel outdoors (vapours concentrate in enclosed areas).
- Don't smoke.
- Don't use gasoline for cleaning (solvent is safer).
- Be aware of ignition sources (electrical equipment, engines, cell phones, pilot lights, static charges).
- Be aware that empty containers contain flammable vapours.

Prevent Spills!

- Stay at site while refuelling.
- Pay attention—don't let fuel overflow.

When you transfer fuel to equipment and containers, be aware of the possibility of:

- fire and explosion
- spilling fuel on your body
- spilling fuel into the environment

Reduce fire hazards!

- Do fuel transfers outdoors. Fumes in confined spaces can create an explosive air-fuel mixture.
- Avoid spilling fuel on a hot exhaust system.
- Don't smoke when handling fuels.
- Be aware of any sources of ignition while refuelling. Turn off engines, electrical appliances and pilot lights. Cell phones can be an ignition source. Clothes (especially synthetics) can build up enough static electricity to create sparks that will ignite gasoline vapours.

DVD (2 of 2):

Protect Yourself!

- Wear neoprene gloves
- Avoid leather/cloth gloves (absorb fuel and prolong exposure)

If splashed with fuel:

- Stay away from heaters, furnaces and running engines.
- Remove clothing slowly (static electricity sparks will ignite fuel vapours).
- Wash hands or body thoroughly (soap, hot water) where fuel contacts skin.
- Rinse all traces of fuel out of clothing before machine washing or drying.
- Get medical attention immediately if: skin irritation, nausea, headaches, blurred vision or chest pains.

Protect Yourself!

Wear neoprene gloves when handling fuel. Avoid wearing leather or cloth gloves as they become contaminated and re-expose you every time you wear them. Wash your hands thoroughly if they are splashed with fuel.

Know What to Do if Fuel Splashes on You!

- Stay away from heaters, furnaces and running engines. Remove clothing slowly because static electricity can create a spark that will ignite fuel vapours.
- Thoroughly wash any area where fuel contacts skin (soap and water).
- Rinse all traces of fuel out of clothing before machine washing or drying.
- Get medical attention immediately if you develop skin irritation, nausea, headaches, blurred vision or chest pains.

Use Fuels Only for Their Intended Purpose!

- Don't use gasoline as a solvent for cleaning or degreasing. Safer products, designed for these jobs, are available.
- Cleaning with gasoline creates a high fire risk and exposes you to health hazards.

Prevent Spills!

- Stay at the site while refuelling.
- Monitor suppliers as they refill your tanks. Ensure there is room for fuel to expand when it warms—otherwise it may overflow through the vent.
- Pay attention—don't let fuel overflow.

Empty containers may still pose a hazard. Even if a tank has been emptied, there still may be some vapour or residue remaining.

6.3.2 Fuel Storage

DVD:

Fuel fires are intense! Homes, buildings, equipment and livestock can be destroyed!

- Fuel vapours can easily explode
- Fuel fire can spread quickly over a large area
- High risk of injury or death

Proper storage and handling:

- Keep ignition sources away (fuel, vapours).
- Eliminate static sparks. Connect grounding clamp.
- Remove flammable debris (spills, grass, wood).
- Ground tanks (grounding rod).
- Install fuel tanks at least 30 metres (100 ft.) from buildings.
- Install quick shut-off valve.
- Install fire extinguisher (20 pound ABC minimum).

A few facts about fuel fires:

- Fire poses the highest risk for destruction of nearby homes, buildings, equipment and livestock. In addition, there is the loss of the fuel involved.
- The potential for injury or death is high.
- While liquid fuel is dangerous and potentially destructive, it is extremely dangerous as a vapour. Under certain conditions, vapours can easily explode, spreading fire over a large area.

6.3.3 Fuel Storage Checklist

☑ **Assess your fuel handling and storage practices with this checklist.**

Eliminate Sources of Ignition!

- ☐ Tank vents are set up to discharge vapours away from sources of ignition. (Ignition sources include: electric motors, internal combustion engines, yard lights, electrical power lines, electric fences, air conditioning or heating units, garbage burning barrels and road traffic.)
- ☐ To eliminate static sparks, I have installed a grounding clamp with a heavy copper bonding line. I connect the clamp to equipment before starting to fill up. (This is standard operating procedure when bulk fuel tankers load or unload fuels. It's worth your while. Two common causes of static electricity are the movement of grain through an auger and the movement of vehicles or machinery. Static electricity can cause a spark to jump between two objects, just like a spark plug. A static spark between a fuel nozzle and static-charged farm equipment can ignite fuel vapours as can cell phones and static in synthetic-fibre clothing.)

Take every possible step to reduce the risk of fire at your fuel storage area!

- ☐ On systems with pumps and meters, the wiring is installed and maintained to meet Code for Class I hazardous locations. (Contact a qualified electrician or refer to the Alberta Electrical Code.)
- ☐ I clean up minor spills and keep the fuel storage area free of tall vegetation and debris. (This reduces the danger to the fuel tanks in the event of a grass fire. A glass bottle can concentrate sunlight and ignite dry grass.)
- ☐ I have grounded all above-ground tanks with a grounding rod. (A tank stand by itself doesn't provide a reliable ground.)
- ☐ I have positioned all fuel tanks at least 30 metres (100 ft.) from all buildings. Tanks are located downwind from buildings to reduce the risk of spread. (Suggestion: install a quick shut-off valve. Install an L-shaped elbow to the pipe, and attach a simple ball valve for the safety shut off. Place the valve at a lower height to make it easier to shut off than the existing turn-style valve in case there is a fire. A farmer could use a long object like a broom handle to reach in and shut off the fuel flow, reducing chance of serious burns.)
- ☐ Tanks are anchored to a stable concrete pad so they cannot shift.
- ☐ I use only approved portable containers. (Approved containers are designed and tested to give a proper safety margin in extreme conditions.)
- ☐ I am extremely cautious on hot days when a lot of vapours are venting from the tank. (One common problem with farm standard grade tanks is they do not vent vapours quickly enough. Fire authorities have seen tanks close to rupturing from the pressure of vapours.)
- ☐ I keep fuel lines, hoses, valves and nozzles in good repair.

- ☐ I have installed a fire extinguisher (Type ABC of at least 20 pounds) close to my fuel tanks. I check and maintain the extinguisher regularly. (It's no good to you if it doesn't work.)
- ☐ I do not use old storage tanks to store feed or water. (Fuel vapours, lead compounds and other contaminants remain after the fuel tank has been emptied, and can't be easily removed.)

6.3.4 Fire

DVD (1 of 2):

Fuel fire! What are your priorities?

- Human safety comes first
- Property comes second
- Don't risk your life for possessions

If someone catches fire:

- Wrap person in blanket or roll on ground to remove oxygen and extinguish fire.
- If this doesn't work, use an ABC dry chemical fire extinguisher.

Remember, diesel and gasoline float. Don't wash flames to an area of higher danger.

Keep your priorities straight!

- human safety comes first
- property comes second
- don't risk your life for possessions

DVD (2 of 2):

Fire Emergency Procedures:

- First, make sure you are safe.
- Stay calm. THINK before you act.
- Call fire department and ambulance.
- Remove injured people to safe site (upwind).
- If there is a danger of explosion, get away!
- If possible, stop fuel flow.
- Remove ongoing sources of ignition (electricity).
- Attempt to extinguish flames IF THE FIRE IS SMALL (extinguisher).

In the event of a petroleum fire, follow these emergency procedures!

- First, make sure you are safe.
- Stay calm. THINK before you act.
- Call the fire department and ambulance. Keep emergency telephone numbers and your land location close to the telephone.
- Remove any injured people to a safe site, generally upwind from the fire.
- If there is a danger of explosion, get away!
- If possible, stop the flow of fuel feeding the fire.
- Remove ongoing sources of ignition (e.g., shut off the electricity).
- Attempt to extinguish flames IF THE FIRE IS SMALL. Use approved fire-fighting equipment.

Remember, diesel and gasoline float. Don't wash flames to an area of higher danger.

If someone is splashed with fuel and catches fire, wrap them in a blanket or roll the person on the ground to remove oxygen and extinguish the fire. If this doesn't work, use an ABC dry chemical fire extinguisher.

6.3.5 Leaks and Spills

DVD (1 of 2):

Preserve the soil and water for the next generation!

Fuel leaks and spills are expensive and damaging:

- Cost of the fuel
- Cleanup expenses
- Long-term environmental damage (groundwater contamination)

By law, a fuel spill or leak must be reported to Alberta Environment when:

- 200 litres (44 gal.) or more of gasoline or diesel fuel are spilled
- Any amount enters a watercourse, body of water or groundwater

Farmers see themselves as protectors of the land—preserving the soil and water for the next generation.

That's why fuel spills are such a serious concern.

It's not only the cost of the fuel and the hassle of cleanup; it's the very real danger of long-term environmental damage, like contamination of groundwater, which is impossible to clean up.

DVD (2 of 2):

Response to fuel spill or leak (above ground):

- Stop flow of fuel.
- Remove ignition sources. Be prepared to use a fire extinguisher.
- Contain the spilled fuel. Work upwind. Dam with soil or other absorbent material.
- Protect water sources and septic systems.
- Clean up all fuel. Shovel contaminated soil into metal containers. If fuel ponds form, hire a hazardous materials vacuum truck.
- Dispose of contaminated materials as directed by local fire authority and Alberta Environment. Do not dump or bury on your property without permission.

In the event of a fuel spill or leak (above ground):

- Stop the flow of fuel.
- Remove all sources of ignition. Be prepared to use a fire extinguisher.
- Remember that gas vapours flow downhill and are extremely explosive.
- Contain the spilled fuel by damming with earth or another suitable absorbent material.
- Don't wash spilled fuel away into potentially higher risk areas. Protect water sources and septic systems.
- Clean up all fuel by shovelling the contaminated earth or absorbent material into metal containers. In the case of fuel forming ponds, a hazardous materials vacuum truck is required to remove the majority of the fuel.
- Dispose of contaminated cleanup materials in accordance with the local fire authority and Alberta Environment. Do not dump or bury on your property without permission.
- Ensure that all ignitable vapours are dispersed before resuming normal activities.

In the event of fire:

- Work from the upwind side to avoid inhaling vapours and becoming engulfed in flames.
- With oil, fuel or oil bath fires, it is best to reach for the far side of the fire, and in a sweeping motion bring the fire towards you with the suppressor to prevent the spread of flaming liquids.

When must a spill be reported?

- By law, all spills and leaks of 200 litres (44 gal.) or more of gasoline or diesel fuel MUST be reported to Alberta Environment.
- Spills or leaks of lesser amounts must also be reported if they have, or may have, an adverse effect on the environment. An adverse effect is defined as "impairment of or damage to the environment, human health or safety, or property."
- Any leak or spill of any amount into a watercourse, a body of water or groundwater MUST be reported.

In the event of a spill or leak from an underground fuel tank or line:

- Contact Alberta Environment. Personnel from Alberta Environment will explain the procedures to follow.

Pollution Emergency Response Team, Alberta Environment: 1-800-222-6514

6.3.6 Procedures for Detecting Fuel Leaks

DVD:

Prevent and detect expensive fuel leaks!

Overhead tanks:

- Visually inspect tanks and area for leaks twice per month.
- Close main valves (prevents hose/nozzle leaks).

On-ground and underground tanks:

- Maintain ongoing inventory control (add deliveries, subtract usage, compare expected and actual volume).
- Measure fuel level with dipstick; use tank chart for actual volume.
- If ongoing inventory not possible: twice per month, measure level in unused tank over 24 hours. Compare measurements.
- Investigate unexplained losses.
- Check tank for water entry (leak indicator).

The Risk Factors

- In overhead tanks, the largest risk is from upset of the tank and loss of the entire contents. Cleanup costs can be high, especially if the leaked fuel contaminates surface or ground water. In addition, there is always the risk of leaked fuel igniting. Smaller losses can be caused by failure of valves, hoses or nozzles.
- The greatest risk of loss affecting both on-ground and underground tanks is an undetected leak in the concealed portion of the system. There is an ongoing loss of fuel, and once the loss is detected, repair and cleanup costs can be very high.
- Contamination of underground water is an extremely serious problem. There is no practical way to clean up groundwater contamination.
- Vapours from leaked fuel may enter buildings through septic lines or other means, with potentially explosive results. Even if explosive levels are not reached, there is still the health risk of prolonged exposure to fuel vapours.
- Prevention is the first, best defence. Proper siting, installation and maintenance of fuel storage facilities minimize the risk of fuel leakage.

Monitoring Overhead Fuel Tanks for Leakage

Early detection is the best way to minimize losses.

- Visually inspect overhead tanks and the surrounding area for leaks twice per month.
- Close the main valves on the tanks when they aren't in use. This prevents leakage through the hose or nozzle.

Monitoring Underground and On-ground Tanks for Leakage

For underground and on-ground tanks, monitoring the volume of fuel is the first method of leak detection. This is accomplished by maintaining an ongoing inventory control, where deliveries are added, usage is subtracted and the expected volume is compared to the actual volume.

A two-year running history of these inventory records must be kept, and it's recommended they be retained for the life of the tank.

- Actual fuel volume is obtained by "dipping" the tanks—measuring the amount of fuel with a dip stick or tape.
- Don't dip tanks immediately after fuel delivery. Allow time for fuel agitation to subside. Obtain and use a fuel inventory control sheet.
- If the size of the tank is known, tank charts will give the actual fuel volume for different depth measurements. Tank manufacturers can provide these charts.
- If it's not possible to maintain an ongoing inventory record (tank size is unknown or pumps aren't equipped with meters), use the following procedure. At least twice per month, allow the tank to sit unused for 24 hours. Measure the level of fuel at the start and end of the 24 hour period. Compare the measurements for signs of fuel loss.
- Any trend of unexplained losses may indicate a leak and should be investigated.

Monitoring for Water Entry into Tanks

Fuel tanks should be regularly checked for water. Water settles to the bottom of the tank, allowing measurement of the amount of water present.

- When dipping tanks, smear 130-150 millimetres (5-6 in.) of water paste at the bottom of the dip stick or tape. Water paste is available from petroleum equipment suppliers. If water is present, the paste will change colour from yellow to red.
- Water can invade tanks through leakage or condensation. If there is a general increase in water in the tank after a rainfall or if the level of water at the bottom of an underground tank exceeds 50 millimetres (2 in.), this may indicate that your tank or fuel line is leaking.

6.4 Grain Bin Checklist

DVD:

High volumes of flowing grain can trap and suffocate a person!

Additional hazards:

- Crusted grain (fall through, suffocation)
- High dust/mould levels
- Oxygen deficient atmosphere (wet grain)
- Power lines (auger contact)

Prevention:

- Lock entrances (keep bystanders, children out).
- Install ladders inside bins.
- Treat grain bin entry as confined space entry: stop and lock unloading equipment, wear harness and line, have safety watch person outside.
- Wear NIOSH-approved respirator (dust, mould).
- Keep children off grain wagons/trucks.

Storage and handling of large volumes of grain or feed is commonplace on farms. Large bins and automated equipment make grain handling easy and fast. But, grain storage structures and handling equipment also create hazardous work areas.

Common hazards include:

- Entrapment in flowing grain. Grain bin "drownings" happen every year.
- Air pockets under crusted grain. People can fall through and be buried.
- High concentrations of dust and mould. These contribute to respiratory problems and lung damage.
- Hazardous atmospheres in a confined space. Natural processes in grain can release carbon dioxide, creating an oxygen deficient atmosphere, especially when the grain is wet and fermentation occurs.

☑ **Use this checklist to assess your grain storage and handling practices.**

☐ I have labelled grain bins to warn of entrapment hazards.

☐ I lock entrances to grain handling areas to keep bystanders and children out.

☐ I have installed ladders inside bins.

☐ I do not enter grain bins that are being loaded or unloaded. (High volumes of flowing grain can trap and suffocate a person in seconds.)

- ☐ If I must enter a bin, I turn off all unloading equipment and use a padlock to lock out switches so they can't be activated accidentally. I use a safety harness and safety line. I never enter a grain bin alone—I have someone outside to assist or call for help.
- ☐ I wear NIOSH-approved dust filtering respirators when working in and around grain handling areas. (Inhalation of large amounts of dust and mould can cause long-term health problems. N95 respirators provide substantial protection, but P100 respirators provide the highest degree of protection.)
- ☐ I wear approved hearing protection when working around noisy equipment (tractors, auger motors, aeration fans, dryers, etc.).
- ☐ I exercise extreme caution when grain is in poor condition. (Crusted grain may have cavities beneath the surface that can collapse, leading to entrapment and suffocation. Fermentation may cause carbon dioxide to build up, creating an unsafe atmosphere due to low oxygen. High-volume power ventilation can substantially reduce the CO_2 hazard; however, in some situations, entry may require self-contained breathing apparatus.)
- ☐ I keep bystanders and children away from grain bins and grain handling equipment.
- ☐ I do not let children play or ride on grain wagons or trucks. (If the vehicle's unloading gate opens accidentally, the child will be pulled into the flowing mass and will likely suffocate if wedged in the opening.)
- ☐ When moving augers, I always check for overhead power lines.

6.4.1 Grain Bin Rescue

DVD:

Rescue of person trapped in grain bin:

- Shut off power unloading equipment immediately.
- If person is buried, turn on aeration fan and call for rescue.
- Rescue team will use special tools to cut open bin and rapidly remove grain.

THINK before attempting rescue.

- Don't take chances.
- Don't be the second victim.

Rescuing Someone Trapped in a Grain Bin

- If someone on your farm has become trapped in grain, shut off power unloading equipment immediately.
- IF THE PERSON IS BURIED, turn on the aeration fan and call your local rescue service (fire department and ambulance). The best way to rescue a BURIED victim is to rapidly remove the grain by cutting open the bin with special rescue tools.
- THINK before you attempt rescue. Don't take chances that will make you the second victim. Don't make the situation worse than it already is.

6.5 Falls on the Farm Yard

DVD:

Slips, trips and falls are the most common causes of injury on farms!

- Good habits pay off. Avoid high-risk behaviour (taking chances)!
- Distractions that reduce alertness to hazards: haste, fatigue, emotional upset, illness.
- Adjust your work to maintain a safety margin.
- Avoid working in high locations if you are ill, tired or taking strong medications.
- Avoid heights when the weather is windy or stormy.

Farm yards are notorious for slippery conditions. Slips, trips and falls are the most common causes of injury on farms.

- When you slip or trip, you hit the ground in an uncontrolled way. It's very easy to sprain your wrist, twist your back or even get a concussion.
- Falls from heights are more serious, causing major injuries and sometimes death.

Here are the key strategies for preventing slip/fall injuries:

- Know the causes of trips, slips and falls.
- Eliminate yard hazards wherever possible.
- Cultivate an attitude of avoiding high-risk behaviour.
- Be aware of personal factors that increase the risk.

Causes of slips, trips and falls:

- hazards: slippery conditions and uneven ground
- hazards: unsafe equipment or facilities
- personal factors: risk-taking behaviour
- personal factors: risk-taking behaviour, hurrying, fatigue, emotional upset, illness and drowsiness

Avoid high-risk behaviour!

- Make it your normal practice to avoid taking chances.
- In a while, smart habits will become automatic—and will pay off many times over the life of your farming career.

Know yourself! Be aware of your physical and mental status, and adjust your work to maintain a safety margin.

- Avoid working in high locations if you are ill, tired or taking strong medications. Avoid heights when the weather is windy or stormy.
- Major factors that contribute to slip/fall injuries are: haste, fatigue, emotional upset and illness. These distractions reduce your alertness to hazard situations.
- Think before you act. Be sharp on the job!

6.5.1 Fall Prevention Checklist

DVD:

Control slip and fall hazards on your farm!

- Keep aisles and walkways free of debris.
- Keep stairs, floors and working surfaces as free as possible of mud, manure and snow.
- Fix damaged steps, ladders, floor boards and concrete defects.
- Put sand or salt on slippery or icy working surfaces.
- Install handrails in stairways.
- Install adequate lighting in buildings and work areas.

☑ **Use this checklist to assess your farm yard for obvious slip and fall hazards. Take steps to get dangerous spots under control.**

☐ I keep aisles and walkways free of debris that could cause trips or pose a fire hazard.

☐ I keep stairs, floors and working surfaces as free as possible of mud, manure or snow.

☐ I keep facilities in good repair. (Fix any damaged steps, ladders, floor boards and concrete defects.)

☐ I clean up oil spills and other slippery materials right away.

☐ I spread sand or salt on icy working surfaces.

☐ I ensure that everyone on site wears slip-resistant safety footwear.

☐ I have installed secure handrails in every stairway.

☐ I have protected hay chutes and poultry clean-out openings with railings.

☐ I have installed adequate lighting in buildings and work areas so everyone can see where they are going.

6.6 Lawn Mowers

DVD (1 of 2):

Respect the power of your mower!

- Causes of injury: blade contact, propelled objects, tip over, run over.
- Operator must be trained, competent and responsible.
- Clear debris off lawn.
- Avoid: bare feet and sandals. Wear sturdy shoes or steel-toed boots.
- Ensure safety devices work and guards/deflectors are installed.
- Keep adults, children and pets away.
- No riders, period. Most common child injury: falling off driver's lap and into blades.
- On slopes drive up/down and not across. Don't use riding mower if very steep.

What Are the Main Hazards?

Injuries from power lawn mowers have four main causes:

- Contact with rotating blade. Hand and foot injuries are the most common.
- Being struck with propelled objects. Rocks, glass and wire can be thrown at initial speeds above 220 km per hour when struck by moving blades. Debris may fly 15 metres (50 ft.) or more, causing severe injury to people and pets.
- Tip-overs on steep slopes. These can cause a person to be pinned under the mower or contact the blade.
- Being run over by a mower. Children playing in the mowing area can be seriously hurt if, for example, the operator backs up without checking behind. Or, an operator could be distracted and pull a hand mower backward over his or her own foot.

Preparing to Mow

- Read and understand the operator's manual.
- Ensure anyone operating the mower is trained and has demonstrated competence in its operation.
- Clear debris off your lawn before mowing.
- Ensure guards, shields and deflectors are in place.
- Dress correctly for the job. Avoid bare feet, sandals and sneakers. Wear sturdy shoes or boots. Steel-toed safety boots are the best choice.
- Don't fill the fuel tank with the engine running.
- Keep people and pets away from the area being mowed.
- Ensure that the operator-presence switch or seat switch stops the mower immediately when you release the control or raise yourself above the seat.
- Wear earplugs to protect your hearing.

- Drive up and down when mowing on slopes with a ride-on mower. Mow across the slope with a hand mower. Avoid using a riding mower on a very steep slope.

Lawn Mowers and Children

For many farm children, a riding lawn mower is their first tractor. However, these are powerful machines—tools, not toys. Underneath, there's a sharp, heavy blade moving at more than 30 revolutions per second.

Lawn mower injuries are serious. They commonly include deep cuts, loss of fingers and toes, broken and dislocated bones, burns and eye injuries. In severe situations they can lead to partial loss of one or both legs.

Bad habits increase the risk to children. It may seem harmless to take children along for a joy ride, but the most common cause of injury is a child falling off the driver's lap and into the blades.

This is not only devastating to the child; it severely affects the well-meaning parent, grandparent or sibling who was driving.

The only safe rule is: no riders, period. Children used to getting rides often run toward the mower, without the operator even knowing that the child is there. It's a recipe for disaster.

DVD (2 of 2):

Young operators must understand: lawn mowers are powerful tools, not toys!

- Teach good operating habits (last a lifetime).
- Walk-behind mowers: 12+ years.
- Riding mowers: 14-16 years.
- Must: reach controls easily, activate seat switch.
- Demonstrate controls and operation. Have child explain "things they must never do."
- Practice driving without blade engaged (follow a track).
- Start mowing in open, flat areas. Supervise.
- Encourage child to stop engine and ask questions.
- Make it clear: riders and horseplay are dangerous and unacceptable.

When Can a Child Operate a Mower?

Children must be at least 12 to operate walk-behind mowers.

To operate ride-on mowers, children must be at least 14-16, depending on their coordination, size, strength and responsibility. They must be tall enough to comfortably reach the controls and heavy enough to activate the safety switch in the seat ("operator presence" switch). If these conditions are not met, they are not ready to run the machine.

Never disable the seat safety switch. This is doubly important when children are operating.

Never place weights on the seat to allow a small child to run the mower.

Training:

- Explain and demonstrate controls and operation, and have the child demonstrate them back to you.
- Make sure they can also explain "things they must never do" such as putting their fingers under the deck to clear obstructions.
- Have the child learn to drive the tractor without the blade engaged, until they are able to confidently control the machine. This is not a joyride—give them a simple course or "track" to follow.
- Start mowing with large, open, flat areas.
- Supervise carefully and frequently. Assess their ability with a critical eye.
- Encourage children to stop the mower (mower and engine stopped dead), find you and ask questions or raise concerns. Be patient—by asking, they are doing the smart thing.
- Remember that you are teaching them skills and principles that will help them safely operate all sorts of vehicles and machinery in the future. Now is the time to learn good habits.
- Never allow children to mow steep hills or ditches.
- Make it clear that riders and horseplay are dangerous and unacceptable while mowing.

6.7 Electrical Safety

DVD (1 of 2):

Circuit breakers protect wiring, not people!

- Cardiac arrest or suffocation can occur before breakers trip

Shock/electrocution hazards:

- Faulty wiring, improper grounding, damaged tools/extension cords, failure to install GFCIs in damp/wet locations
- Equipment contact with yard wiring or high voltage utility lines (grain augers, combines, cultivators during transport)
- Standby generators (must be connected by transfer switch to isolate farm wiring from electrical grid)

Injury hazard:

- Switching on circuits or equipment during repairs/maintenance (panels/switches supplying large equipment should be lockable to ensure isolation)

Common Types of Electrical Injuries on Farms

- shock or electrocution due to faulty wiring, damaged tools or damaged extension cords
- shock or electrocution in damp or wet locations such as out-buildings and dairy barns
- accidental energizing of circuits or equipment while someone is performing repairs or maintenance
- equipment contact with yard wiring or high voltage (15 kV or 15,000 volt) utility lines (a major concern with tall equipment such as grain augers, combines, large tillage equipment in transport position)

What's the Danger Threshold?

- A fuse or circuit breaker will not protect a person from dangerous electrical shock. These are designed only to protect the wiring from excessive current, which can lead to overheating and fire. A 15 amp breaker will allow many times more current than is needed to harm a person.
- Several hundred milliamps (1/1000 of an amp) flowing through the chest is enough to stop the heart from beating and paralyze the muscle around the lungs. This can cause cardiac arrest or suffocation.

Preventing Shock (Building Wiring and Electrical Equipment)

- Ensure that your wiring accepts three-prong plugs and that a proper ground is connected.
- Use only double insulated or three-prong tools and equipment.
- Never remove the third (ground) pin from an electrical appliance.

- Inspect all tools, equipment and appliances for faulty plugs and frayed cords. If damage is detected, don't use the item until proper repairs have been done.
- Watch out for temporary extension cords that become permanent. They are vulnerable to damage over time.
- Outlets and electrical equipment in damp or wet locations must be protected with GFCI (ground fault circuit interrupter) circuits to meet Code. A GFCI detects an improper current flow and interrupts the circuit in an instant to protect you from electrocution.

Electrical Lockout

Breaker panels and switches that supply large equipment should also have lockout capability (e.g., silage unloaders, electric grain augers). This allows the equipment to be positively isolated for repair or maintenance, so that no one can unwittingly turn it on.

DVD (2 of 2):

Machinery and overhead wires are a life-threatening mix!

- Don't provide an accidental path for electricity (grain auger, combine, ladder).
- Scan your work area.
- 220 volt yard wiring can kill.

High voltage utility lines:

- Contact = death
- Electricity will arc across—minimum clearance is 3 metres (10 feet) or more.
- Normal insulators become conductors (wood, paint).

Accidental contact:

- Stay on equipment.
- Ask someone to contact utility company (de-energize line).
- If fire occurs, jump away from equipment.

Machinery and Overhead Wires

- Don't provide an accidental path for electricity to move to ground. 220 volt yard wiring has the power to kill the unwary.
- Utility supply lines are especially dangerous, at some 15,000 volts. At these high transmission voltages, you don't need to touch the wire. The electricity will arc across if you get too close. Death is likely. At high voltages, many materials that normally insulate will conduct electricity, including wood and paint. Maintain a minimum distance (contact your utility provider—clearance must be 3 metres (10 ft.) or more, depending on the voltage in your area.)
- The most common hazard is the grain auger. The farmer is in a hurry to move the auger to another bin. To save time, he doesn't lower it, or he forgets—his mind is on the job and the weather. He hits the line, and the result is death or severe electrical burns. It's doubly tragic because it is completely preventable.
- Use caution with ladders. Aluminum and damp wood will conduct electricity. Scan your work area so you avoid contact with overhead power lines.

Accidental Contact: What to Do

- If your tractor or combine contacts overhead power lines, stay on the equipment.
- Ask someone to contact your local utility company immediately, so they can de-energize the line.
- If a fire forces you to leave the equipment, JUMP away from the equipment as far as possible. Do not allow your body to touch the machine and the ground at the same time, or electricity will flow through you.
- Never try to get back on equipment until the line is de-energized.

Standby Generators

Standby generators must be connected via a transfer switch. This isolates your farm wiring from the rest of the electrical grid. Without it, power company workers could be electrocuted as they try to repair lines.

SECTION 7: CHILD SAFETY

7.1 Child Safety—Introduction (Video)

FROM THE VIDEO:

This is my farm. Let me show you.

We have lots of room on our yard, I have a dog and some cats, and I can ride my bike.

There are some places I'm not supposed to go because I could get hurt.

This is where Mom and Dad's work stuff is, poisons and power tools, that's why there's a lock.

These are fuel tanks—if they start on fire our house and barn could burn down.

Silos and ladders aren't for kids to climb.

And the sewage lagoon is a place I could fall in and drown.

I'm never supposed to touch controls on tractors, not even for pretend, unless there's an adult with me—'cause they're tools, not toys.

Instead of climbing on the tractor and the combine, I have a swing set and a sand box, and a playhouse my Dad helped me build.

My Mom and Dad know what's safe and what isn't. They taught me all about it.

But sometimes I have to remind them what they said.

7.2 Is Your Child Safe?

DVD:

Every year, children lose lives and limbs while:

- Working on the farm
- Wandering into danger zones
- Being invited into hazardous areas

Children are the farmers of the future!

- Are you aware of the hazards?
- Is there an acceptable level of risk?
- How do you balance "safety" and "hands-on learning"?

From this generation of children comes the next generation of farmers. The farm community can't afford to put its future at risk.

- Every year children lose lives and limbs in farm accidents, and the number of injuries is much too high.
- Some of these children are working on the farm, while others wander into trouble on their own or are invited into hazardous areas.

7.2.1 Common Dangers for Children

DVD:

Myth: farm tragedies involving children "just happen."

Fact: all child injuries are preventable.

Top 5 dangers to children (Canada-wide):

1. Run over by machine
2. Fell from machine, then run over
3. Machine rollover
4. Animal related
5. Entangled

Other common dangers:

- Toxic chemicals
- ATVs
- Silos
- Dugouts

Everyone has heard stories of children being hurt; there's a myth that such tragedies are unavoidable.

Let's be clear, all child injuries are preventable. What's required? Planning and positive action.

Most Common Dangers for Children:

- bystander runover
- driver fall from machine and runover
- rider fall from machine and runover
- toxic chemicals
- ATVs
- farm equipment
- silos
- livestock
- dugouts

For more statistics, visit this website:

http://meds.lqueensu.ca/nemresrch/caisp/natrep.html

7.2.2 A Plan of Action

DVD (1 of 5):

Top 10 ways to keep children safe:

1. Walk around your farm (view from children's perspective).
   - What dangerous places could they enter?
2. Know where your children are. Control where they go.
   - Take them on a tour of the farm.
   - Teach them that many places on the farmsite are not places to play.
3. Teach children to recognize danger zones!
   - Mark dangerous places on the farm: signs, markers, decals.
   - Explain these are not "kid places."
   - Lock or block access to: grain bins, silos, dugouts, manure pits, chemical sheds.

DVD (2 of 5):

Top 10 ways to keep children safe;

4. Don't allow children to use farm equipment as a playground.
   - Whether machinery is stopped or running, children are unaware of the dangers.
   - Hydraulics can remain pressurized, starter switches energized, or children can cause equipment to move while you are servicing it.
5. No extra seat, no rider.
   - Every year, children are run over after falling from tractors.
6. When equipment is not in use, remove the ignition key and set the parking brake.
7. Give children tasks that are appropriate to their age.

DVD (3 of 5):

Top 10 ways to keep children safe:

8. Invest the time: train children to do age-appropriate jobs properly and safely.
   - Don't assume they know everything you know, and can do everything you can do.
9. Train your children before allowing them to operate an ATV (quad).
   - Make sure they have the right size ATV for their age, size and strength.
   - Make sure they always wear a helmet and appropriate clothing.
10. Create a safe and secure play area for children.
    - Is it well-supervised and maintained?
    - Is it away from all working parts of the farm?

A Plan of Action for a Child-Safe Farm

- Develop a safety plan for children on your farm. Check your farm on a regular basis for hazards that can injure children on your farm. Correct or eliminate these hazards immediately.
- Do a safety walk-about on the farm with the family, and discuss hazards (family vehicles, machinery, livestock, electrical, fire, falls, chemicals, sewage lagoons, ponds, ditches, old wells, grain bins, wagons, trenches and any others).
- Talk about how to be safe, how to report dangers to an adult, and how and whom to phone for help. Put up a list of emergency phone numbers and directions to the farm near each phone.
- Actively teach safety on a regular basis and encourage children to participate in safety day camps and Safety Smart courses where available.
- Then, let the children teach you, the adults, about safety. It's the best way to see if the kids have really understood what you've told them and know how to apply it.

DVD (4 of 5):

Small children are naturally curious and inquisitive:

- Drawn to noise, action and novelty
- Short attention span
- Don't remember rules very well
- Not capable of understanding risks and consequences of injury
- Rely on adults to protect them

Parents often:

- Over-estimate their child's ability, understanding and maturity
- Under-estimate risks, assuming injuries will never happen on their farm

Adults must explain and enforce farm safety rules (never play in work areas!), and ensure unsafe actions have consequences.

DVD (5 of 5):

A safe play area on your farm should have:

- Specific boundaries
- Play space matched to children's needs (increases with age)
- Separation from vehicle/equipment traffic, dust, noise
- Barriers from open water and farm animals
- Easy supervision (sight and sound) for responsible adult
- No toxic material (paint, preservatives)
- No slivers, sharp edges, protruding ends
- No entrapment hazards (head) and pinch points (hands, feet)
- Properly anchored play equipment
- Cushioning material deep enough to break a fall

For Small Children:

- Do not allow children to roam freely on the farm. Constant supervision is necessary when small children are around farm activities.
- If supervision is not possible, create a safe play area near the house. Fence it off and equip it with a variety of play centres for young children. The farm is a workplace as well as a living place, and for youngsters, separation of the two is the safest.

7.3 Child Safety Checklist

DVD:

Take action to child-proof your farm!

- Fence off any water body near the home.
- Lock or secure all barns, farm shops, chemical storage areas, livestock pens, etc. so that children cannot enter.

Do your actions expose children to hazards?

- Never carry children on tractors and equipment.
- Don't invite children into the farm shop, livestock barns, grain bins, etc.

Do your actions teach children safe practices?

- Wear a helmet when riding a horse.
- Set a good example when driving an ATV.

☑ **Use this checklist to assess whether your yard is safe for children.**

- ☐ I keep fixed ladders barricaded or out of children's reach. Portable ladders are stored out of reach.
- ☐ I practice a "No Riders" policy: no extra seat, no seat belt, no extra rider on any equipment.
- ☐ I do not expose children to hazards. I never carry them on tractors and equipment or invite them into the farm shop, livestock barns, grain bins, etc. I set an example with my actions.
- ☐ I lock or secure all barns, farm shops, chemical storage areas, livestock pens, etc. so that children cannot enter.
- ☐ I have equipped all barns, farm shops, chemical storage areas, livestock pens, etc. with latches that can be locked or secured so that children cannot enter.
- ☐ I have fenced off any water body near the home.
- ☐ I always check for children around vehicles and equipment before driving.
- ☐ I always turn equipment off, lower hydraulics and remove the key before leaving equipment unattended. I remove ignition keys from vehicles when not in use.
- ☐ I have purchased a riding helmet for each youngster who is learning to ride a horse. I expect and encourage them to wear it every time they ride.
- ☐ I teach young children to stay away from large equipment and large animals.
- ☐ Children are taught that ATVs are not toys. Children wear a helmet and other recommended safety equipment, obey traffic rules and avoid high speeds. I set a good example when I drive an ATV.
- ☐ Children who are physically able to help with farm work are assigned age-appropriate tasks and continually trained to perform them. They are constantly supervised. (Keep in mind that children are much less likely to perceive and react to dangers than an adult.)
- ☐ I have taken a first aid course, so I can respond to injuries quickly.

7.4 Age-Appropriate Farm Tasks for Children

DVD (1 of 5):

On a farm, children can learn responsibility at an early age.

- Helping with farm work can be positive for the child and the family.
- Parents must find a balance: "learn to do by doing" but avoid "too much weight on a young back."
- Inappropriate tasks lead to injury.

Consider carefully: is the task appropriate for the child?

- The child's abilities must match the task.
- Don't over-estimate physical ability, maturity or stage of development.
- Risk of injury if task is too physically demanding, too complex or carries too much responsibility.

On farms, children are often integrated into the operation at a very early age. The tradition of "learning to do by doing" is a time-honoured one. But it has to be done wisely, so the child's physical ability and maturity level matches the job to be done.

Be careful to avoid "too much weight on a young back." Parents often over-estimate their child's abilities and stage of development. If the job is too physically demanding, too complex or carries too much responsibility, the child is at risk of injury.

DVD (2 of 5):

Training your child is a long-term investment! Safe work habits last a lifetime.

- Assign age-appropriate tasks.
- Train child to perform them. Explain and demonstrate. Then have child demonstrate.
- Constantly supervise.
- Remember that children are much less likely to perceive and react to dangers than an adult.
- Reinforce training constantly and positively.
- Be patient. Encourage questions. Be a resource your child can turn to.
- Set a good example; actions speak louder than words. They will do what you do.

DVD (3 of 5):

Free NAGCAT checklists for age-appropriate tasks are available!

- Included in the print manual
- Included on the Farm Safety CD-ROM
- Posted on the Internet: http://www.nagcat.com

NAGCAT checklists are:

- Easy to use
- Time savers
- Developed by doctors and injury specialists

DVD (4 of 5):

Examples of NAGCAT checklists for age-appropriate tasks:

Animal Care:

- Feeding hay to horses
- Milking cows
- Working with large animals

General Activities:

- Farmwork with an ATV
- Operating a skid steer
- Repairing fence
- Using a front-end loader

DVD (5 of 5):

Examples of NAGCAT checklists for age-appropriate tasks:

Haying:

- Moving round bales
- Raking

Implement Operations:

- Unloading grain
- Unloading silage

Tractor Fundamentals:

- Driving a farm tractor
- Hydraulics
- Power takeoff