



# → CHAPTER 4.0

## **Storage, Handling and Disposal of Agricultural Inputs**

This chapter outlines beneficial management practices for the storage, handling and disposal of pesticides (herbicides, fungicides, insecticides, rodenticides and pesticide-treated seed), commercial fertilizers, manure, petroleum products and treated seed.

Agricultural inputs include pesticides, commercial fertilizer, manure, and petroleum products. All products should also be stored in a safe and secure manner, handled to prevent contamination of water and air, and disposed of properly according to the environmental regulations.

Protective clothing and equipment are vital for anyone handling agricultural chemicals. See AAFRD's *Crop Protection* manual (the 'blue book') for more information.

## 4.1 Pesticides

Pesticides used in crop production include herbicides, fungicides, insecticides, rodenticides and pesticide-treated seed. Improper storage and handling of pesticides can contaminate soil, water and air and can harm humans, animals and plants. Always follow proper procedures and precautions. Some producers choose to use custom applicators for pesticide applications.

### 4.1.1 Storage

No pesticide should be stored on the farm. Order only the amount needed and use it immediately. If you cannot use it immediately then have it stored by the supplier. Suppliers are set up to handle the product as a hazardous good. This eliminates the liability of accidents.

If you must store a pesticide on the farm, follow the guidelines below.

#### Product Storage

- ▶ The amount stored must be less than 20 L or 20 kg of product (under the *Environmental Protection and Enhancement Act*). Storage time should not exceed one month.
- ▶ Consult the pesticide's label for specific storage instructions.
- ▶ Store the pesticide in the original containers with the manufacturer's labels; if supplementary containers are used, make sure they are properly labelled.
- ▶ Do not store with food, feed, seed, drinking water or protective equipment.
- ▶ If a product container is leaking, **overpack** the container by packing it in a larger container with leak collection material (such as kitty litter).
- ▶ As a precaution, use **secondary containment** made of an impermeable material to contain possible leaks. For example, store chemical jugs in tubs or trays on storage shelves.

#### Storage Facility

- ▶ Store pesticides in a secure facility, and post signs indicating the contents of storage.
- ▶ Locate the facility more than 30 m (100 ft) from a surface water body and more than 90 m (300 ft) from a water well.
- ▶ Locate the facility downslope and downwind from any water sources.
- ▶ Ensure the facility is constructed to contain spills and minimize or eliminate the potential of contaminating soil and water.
  - Install an impermeable floor (e.g. sealed concrete).
  - Use curbs to contain leaks.
- ▶ Do not have a floor drain. If there is a drain, use a proper holding tank for drainage collection, monitor the tank regularly, and dispose of the fluid in the tank in accordance with hazardous waste regulations.



➔ Store pesticides in a secure facility with posted signs.

*Courtesy of AAFRD*

### Emergency Plan

Prepare an emergency plan in case of a leak or spill at the storage site or when handling. This written plan should include the location of emergency equipment, emergency telephone numbers, cleanup methods and steps to follow.

#### Make sure the following materials for spill cleanup are readily available:

- ▶ absorbent material (such as kitty litter)
- ▶ shovel
- ▶ waste container
- ▶ protective equipment – rubber gloves, rubber boots

### 4.1.2 Mixing and Loading

When mixing and loading pesticides into the sprayer, it is inevitable that a spill will occur some day. Using proper procedures and precautionary methods will minimize or eliminate the risk of contamination.

#### Mixing Location

- ▶ Any mixing and loading areas must be more than 30 m (100 ft) from a surface water body and more than 90 m (300 ft) from a water well.
- ▶ The best option is to mix and load pesticides in the field near the application site. For this option:
  - Change the location of the mixing and loading site with each application.
  - Bring the water to the site in a nurse tank.
- ▶ If you are mixing at a permanent site:
  - Make sure the mixing and loading area can contain spills and drips. It should be able to contain 125% of the sprayer's tank volume. Install an impermeable floor and curbs to contain product. Install a sump to collect product.
  - Cover the mixing pad to eliminate increased volumes of contaminated water from run-on water and precipitation, or design the area to contain these larger volumes.



- ➔ Using proper procedures and protective clothing will minimize or eliminate potential risk of contamination.

*Courtesy of AAFRD*

### Loading

- ▶ Do not leave filling equipment unattended. Have someone in control of the filling operation for the entire time.
- ▶ Have spill containment and cleanup equipment on hand. Have a phone available for emergency calls.
- ▶ To prevent backflow from the sprayer to the water source:
  - Fill the sprayer from a nurse tank away from wells or other bodies of water.
  - Never place a hose into the sprayer below the water line. Leave a minimum 6-inch (15-cm) gap between the hose and the water.
  - Install backflow preventer devices on all water pipes leading to the storage area and the pad.
  - Spray equipment must be fitted with an effective backflow preventer to be permitted to take public surface water (refer to the *Environmental Protection and Enhancement Act*).

### Cleaning Field Equipment

- ▶ Wash the spraying equipment at different locations to prevent chemical buildup in the field.
- ▶ When changing pesticide products, clean out the tanks with water to ensure no product contamination occurs.
- ▶ If possible, rinse the tank in the field, and apply the rinse water (called **rinsate**) directly to crop. If you cannot apply it to the crop, then:
  - apply it on land away from surface water, water wells, septic systems, gardens, shelterbelts and other environmentally sensitive areas, or
  - use it as mix water for later applications when the same chemical is being applied, or
  - apply it on areas requiring total vegetation control (e.g. chemfallow).

### Pesticide Transportation

Pesticides should be secured during transportation. They should not be transported with food, feed, household furnishings, toiletries, clothes, bedding or similar items.

#### 4.1.3 Disposal

##### Pesticide Disposal

**Pesticides are hazardous wastes and cannot be disposed of in sanitary landfills or by burning. To dispose of pesticides:**

- ▶ Return unopened and leftover product to the dealer for a refund.
- ▶ If you are unable to use opened pesticide supplies, offer them to neighbours.
- ▶ Pesticides that have no further use must be disposed of as hazardous waste. The names of companies licensed to handle hazardous waste can be obtained from Alberta Environment's Recycle Information Line at 1-800-463-6326.

##### Pesticide Container Disposal

Empty pesticide containers must be disposed of carefully. Unrinsed empty pesticide containers have the potential to contaminate groundwater and surface water, and can be toxic to fish and wildlife.



➔ Empty pesticide containers must be disposed of at a pesticide container disposal site.

*Courtesy of Alberta Environment*

Under Alberta's *Environmental Protection and Enhancement Act*, non-refillable plastic or metal pesticide containers (restricted agricultural and industrial products) must be disposed of at a pesticide container collection site. A list of pesticide container disposal sites and their hours is available from each municipality, in *Crop Protection* (AAFRD) or from Alberta Environment.

Pesticide containers must be **triple rinsed** or **pressure rinsed** and dry before they are delivered to the pesticide container site. For details on rinsing, consult *Crop Protection* (AAFRD).

Paper and cardboard outer wrappings that have not been contaminated with pesticides can be recycled at a recycling centre. Any cardboard that has been contaminated due to a container rupture, accidental spill, or improper handling procedure, should be taken to a sanitary landfill. Evidence of cardboard contamination includes signs of exposure to liquid, powder or granules, or a strong chemical odour. Some pesticide container sites have bins or separate areas for collecting outer packaging materials. Do not burn paper bags or cardboard containers. Containers should not be reused, and empty containers should be made unsuitable for reuse.



For more information on pesticide storage, handling and disposal, see *Crop Protection* (AAFRD). For specific information on the disposal of product or cleanup of spills, contact Alberta Environment's Environmental Response Centre at 1-800-222-6514.

## 4.2 Commercial Fertilizers and Manure

### 4.2.1 Storage

Fertilizers and manure need to be stored safely to avoid hazards to people, animals and the environment.

#### Amount Stored

The best approach is to store only the amount of fertilizer you need for your immediate use. This reduces the risk of a major spill or other accident. If product needs to be stored, it is recommended that it be secured in a strong, stable, dry structure with a good roof and a cement floor, where moisture, rain and surface water cannot enter.

#### Storage Facility

- ▶ Ensure that the storage facility is secure. This means a locked fenced area, locked building or storage structure separate from all other activities that could damage the containers or spill fertilizer.
- ▶ Post signs stating the contents of the facility in case of fire.
- ▶ Ensure that the facility is located more than 100 m (330 ft) from water wells and more than 20 m (60 ft) from surface water bodies.
- ▶ Do not store fertilizers with fuel, food, feed, seed, drinking water or protective equipment to prevent contamination of these.
- ▶ Monitor the storage site regularly for leaks and spills.

#### Emergency Plan

Prepare an emergency plan in place in case of a leak or spill. This written plan should include the location of emergency equipment, emergency telephone numbers, cleanup methods and steps to follow.

#### Dry Fertilizer Storage

Dry fertilizer should be stored in a building or epoxy-lined bin on an impermeable surface such as sealed concrete.

#### Liquid Fertilizer Storage

- ▶ Regularly inspect all tanks, valves and plumbing used for liquid fertilizer storage.
- ▶ Around the primary storage container, install an impermeable synthetic or clay liner for secondary containment to stop any spills and leaks from entering soil or water.
- ▶ Use sight gauges and lock-on valves on containers.



- ➔ Commercial fertilizers need to be stored safely to avoid hazards to people, animals and the environment.

*Courtesy of AAFRD*

### Manure Storage and Treatment

**For information on manure storage and treatment, see:**

- ▶ *Nutrient Management Planning for Livestock Production* (AAFRD)
- ▶ *Beneficial Management Practices: Environmental Manual for Hog Producers in Alberta* (Alberta Pork and AAFRD, [http://www.agric.gov.ab.ca/livestock/pork/bmp/bmp\\_hogs.html](http://www.agric.gov.ab.ca/livestock/pork/bmp/bmp_hogs.html))
- ▶ *Beneficial Management Practices: Environmental Manual for Feedlot Producers in Alberta* (Alberta Cattle Feeders' Association and AAFRD, [http://www.agric.gov.ab.ca/livestock/beef/bmp/bmp\\_feedlot.html](http://www.agric.gov.ab.ca/livestock/beef/bmp/bmp_feedlot.html))
- ▶ *Beneficial Management Practices: Environmental Manual for Dairy Producers in Alberta* (Alberta Milk and AAFRD, [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/epw7716?opendocument](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/epw7716?opendocument))
- ▶ *Guidelines for Beneficial Management Practices: Environmental Manual for Poultry Producers in Alberta* (AAFRD, Alberta Chicken Producers, Alberta Egg Producers, Alberta Hatching egg Producers and Alberta Turkey Producers, [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/epw7717?opendocument](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/epw7717?opendocument))

#### 4.2.2 Mixing and Loading

When mixing and loading fertilizers, it is inevitable that a spill will occur eventually. Using proper procedures and precautions will minimize or eliminate the risk of contamination from spills.



**Follow these guidelines for proper fertilizer mixing and loading:**

- ▶ Clean up spills when they occur.
- ▶ For dry fertilizer, if you use a permanent mixing and loading area, the mixing pad should be impermeable. Sweep up any spilled dry fertilizer, and store it in a clean container until it can be used.
- ▶ For wet fertilizer, if you use a permanent mixing and loading area, ensure that any spills or leaks can be collected and contained. The mixing pad should have an impermeable floor, curbs and a sump.
- ▶ For mixing wet fertilizers, either have a backflow preventer on the water supply or ensure that there is a 15-cm (6-inch) air gap between the water and the hose. If possible, use a **closed handling system** to transfer the fertilizer directly from the storage container to the applicator equipment, so people and the environment are not exposed to the fertilizer.
- ▶ Do not leave filling equipment unattended.
- ▶ Ensure that loading takes place at least 30 m (100 ft) away from a well or surface water.
- ▶ If loading fertilizers in the field, make sure to use different sites to prevent buildup.

### 4.2.3 Disposal

**Guidelines for disposal of fertilizer rinsate and packaging are:**

- ▶ Apply fertilizer rinsate to a cropped area at a distance greater than 10 m (33 ft) from any surface water source and greater than 60 m (200 ft) from any well.
- ▶ To dispose of dry fertilizer bags, bundle the completely empty bags and dispose of them at a **licensed landfill**.



For more information, see the Canadian Association of Agri-Retailers' *Fertilizer Storage and Handling*.

## 4.3 Petroleum Products

Any fuel or lubricant can cause problems if it contaminates a water source or the soil. Under the EPEA, all gasoline and diesel fuel spills and leaks of 200 L (44 gal) or more must be reported to Alberta Environment. Spills of a lesser amount must be reported if the spill is causing, has caused or may cause an adverse effect on the environment. A leak or spill of any amount into surface water or groundwater must be reported. Cleanup costs can be applied as a penalty.

At present, the Alberta Fire Code: 1997, governs the storage and handling of petroleum products. This Code is administered by Alberta Municipal Affairs. Although on-farm storage and handling of petroleum products is exempt, the following practices serve as guidelines for Alberta farms.

Liquid petroleum products, such as gasoline, diesel fuel and kerosene, must be stored safely to prevent spills and leaks. These products can move quickly through the soil and into groundwater. A small leak of one drop per second can release about 900 L (200 gal) of gasoline into the groundwater in one year. But it takes only a few litres of gasoline to severely pollute a farmstead's drinking water. Low levels of fuel pollution in water are almost impossible to smell or taste. Water that seems pure may be contaminated and harmful to human health.

Explosions are another potential danger from petroleum products. Vapours from an underground leak can collect in basements, sump pits or other underground structures and could explode.

### 4.3.1 Storage

#### Storage Facility

- ▶ Install tanks in accordance with the Alberta Fire Code. A good option is to hire a registered contractor to do the installation.
- ▶ Locate tanks well away from water sources, buildings, **ignition sources** and other fuel tanks (see Table 4.1).
- ▶ For on-ground storage tanks, install secondary containment such as dikes or double-walled tanks to contain spills. If there is no secondary containment, locate tanks downslope from buildings, grain storages, water wells and surface water so any spilled or leaked fuel drains away from those.
- ▶ Mount tanks at ground level or supported on concrete or metal that can provide at least a two-hour fire-resistant rating. Use a firm foundation for tanks to prevent uneven settling.
- ▶ Protect aboveground tanks, underground storage tanks and piping against corrosion to prevent leaks.
- ▶ Protect all pumps, lines and tanks from collision damage. Install **bollards** (barriers constructed of a sturdy material, such as steel piping filled with cement, set up close to fuel tanks to guard against collision damage). Make sure fill-up hoses are long enough so vehicles and farm equipment can be kept at a distance from the tanks.
- ▶ Install anti-siphon valves between the pump and the tank to prevent the tank from draining if the line is broken.
- ▶ Lock all fuel tanks when not in use to reduce the risk of spills due to vandalism and theft.
- ▶ Keep the area around the tank free of vegetation and debris.
- ▶ Keep ignition sources away from fuel tanks, especially from the tank's vents that discharge fuel vapours. Ignition sources include electric motors, yard lights, power lines, air conditioning or heating units, road traffic and garbage burning barrels.
- ▶ Ground pumps and vehicles to avoid buildup of static electricity.

TABLE 4.1

	SEPARATION DISTANCE GUIDELINES FOR PETROLEUM STORAGE	
	MINIMUM DISTANCE FROM FUEL STORAGE	
	(m)	(ft)
Water well	90	300
Surface water body	30	100
Any building	3	10
Source of ignition*	6	20
Another fuel tank	1	3
Propane cylinder	3	10
Propane tanks	6	20

\* This includes sources such as motors and electrical sparks unless electrical sources meet the Code of Electrical Installations at Oil and Gas Facilities.

*Adapted from: Alberta Environmental Farm Plan. 2002. Environmental Farm Plan 2002. Alberta Environmental Farm Plan.*

### **Monitoring the Facility**

- ▶ Keep fuel lines, hoses, valves and nozzles in good repair.
- ▶ Inspect overhead tanks and the area around the tanks for leaks two times monthly.
- ▶ Monitor the volume of fuel in all tanks to detect leaks and other losses. Meter your use to keep track of how much fuel you are using and subtract this amount from the total amount you received.

### **4.3.2 Dispensing Fuel**

- ▶ Ensure that the dispenser unit is ULC and CSA approved, with automatic shut-off valves.
- ▶ Use a hand pump or an electric pump. If using an electric pump, it must be installed according to the Code of Electrical Installations at Oil and Gas Facilities. Gravity feed is not acceptable for dispensing fuel.
- ▶ Close the valves on tank discharges when they are not in use to prevent leakage through the hose or nozzle.
- ▶ When filling containers such as jerry cans, make sure they are supported in an upright position so they do not fall over.

### **4.3.3 Spills and Leaks**

#### **Emergency Plan**

Prepare an emergency plan in case of a leak or spill. This written plan should include the location of emergency equipment, emergency telephone numbers, cleanup methods and steps to follow.

If a spill or leak occurs, contact Alberta Environment (1-800-222-6514).

#### **For an aboveground spill or leak:**

- ▶ Stop the flow of fuel.
- ▶ Contain and clean up the spilled fuel.
  - For spills on floors, use absorbent materials such as sawdust or rags.
  - For spills on soil, excavate the contaminated soil.
- ▶ Shovel the contaminated soil or absorbent materials into a clean container.
- ▶ Dispose of contaminated cleanup materials and soil in accordance with Alberta Environment guidelines.

For a leak or spill in an underground tank or line, contact Alberta Environment for the procedures to follow.

#### 4.3.4 Disposal

Used oil is the largest single source of hazardous recyclable material in Alberta. If improperly managed, used oil and its components such as (heavy metals, chlorinated solvents and PCBs) can contaminate air, soil and water.

**For proper disposal:**

- ▶ Collect all used oil, oil filters and oil containers. They can be returned at no charge to the nearest recycling centre. For locations, contact the Alberta Used Oil Management Association (AUOMA) 1-888-922-2298 or online at <http://www.usedoilrecycling.com/html/alberta.cfm>.
- ▶ Most bulk fuel agents will take solvents, cleaning fluids and glycols (antifreeze).
- ▶ Waste oil companies will pick up waste oils on the farm, if the farm has about 1000 L of product per visit. These companies are in the yellow pages under Oil-Waste.
- ▶ Hazardous waste depots will also accept used materials contaminated with petroleum products.

#### 4.4 Treated Seed

**Practices to properly store and dispose of treated seed include the following:**

- ▶ If you are treating bulk seed on the farm, treat only as much as you need for immediate use.
- ▶ For temporary storage on the farm, place the seed in a secure, sealed container.
- ▶ If you purchased treated seed and have leftover seed in unopened bags, return the bags to the dealer.
- ▶ If you have leftover treated seed that cannot be returned to a dealer, plant the seed at a rate not exceeding three times the normal seeding rate, or contact a regional sanitary landfill for authorization to bring the seed to the landfill for immediate burial.

#### 4.5 Information Sources

##### 4.5.1 Contacts

All Alberta Government offices may be reached toll-free by dialing 310-0000.

- ▶ Alberta Agriculture, Food and Rural Development: Ag-Info Call Centre, phone: 1-866-882-7677; website: <http://www.agric.gov.ab.ca>
- ▶ Your district office of Prairie Farm Rehabilitation Administration (PFRA) of Agriculture and Agri-Food Canada; website: [www.agr.gc.ca/pfra](http://www.agr.gc.ca/pfra)
- ▶ Alberta Environment: General: 780-422-4505; Action-on-Waste Recycle Information: 1-800-463-6326; Environmental Response Centre: 1-800-222-6514; website: <http://www3.gov.ab.ca/env/>
- ▶ Alberta Used Oil Management Association: recycling centre locations: 1-800-922-2298; website: <http://www.usedoilrecycling.com/html/Alberta.cfm>

## 4.5.2 References

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