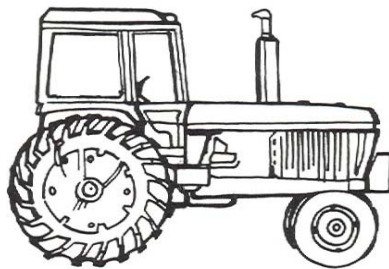


**Occupational Health and Safety
Guidelines**

**for Farming Operations
in Ontario**



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Published June 2006

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Print ISBN 1-4249-0803-5

PDF ISBN 1-4249-0804-3

Le présent document est aussi disponible en français sous le titre « Directives concernant la santé et la sécurité au travail à l'intention des opérations agricoles en Ontario » [ISBN (version imprimée 1-4249-0805-1 / ISBN (version PDF) 1-4249-0806-X]

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INTRODUCTION

The Occupational Health and Safety Guidelines for Farming Operations in Ontario were developed to highlight specific, and sometimes unique and unusual hazards on farms. They were jointly prepared by representatives of the farming community, the Farm Safety Association, the Ministry of Agriculture, Food and Rural Affairs and the Ministry of Labour.

The purpose of the guidelines is to help employers, supervisors and workers on farms recognize hazards and determine the ways they may best comply with their obligations under the Occupational Health and Safety Act (OHSA), and the relevant regulations. The guidelines provide general information to those in the workplace to help them identify specific hazards and dangerous situations. The guidelines may also provide the workplace parties with suggestions to consider in determining how to protect worker health and safety and to prevent injuries.

It is important to understand that the guidelines do not replace the laws that are in place. Employers, supervisors and workers on farms have responsibilities and rights under the Occupational Health and Safety Act and the following four regulations under the Act: Regulation for Farming Operations; Critical Injury – Defined; Training Programs; and, Training Requirements for Certain Skill Sets and Trades. The requirements in the OHSA and these four regulations must be complied with.

Employers have a legal obligation to take every precaution reasonable in the circumstances for the protection of workers; and, supervisors and workers must take appropriate steps to identify and address all workplace hazards. The guidelines are a starting point for the workplace parties to think about how to fulfill their obligations under the OHSA. Following the recommendations suggested in these guidelines does not relieve the workplace parties of their obligations to comply with the OHSA.

This is the first edition of the guidelines. They will be reviewed and updated on an ongoing basis, as needed, and expanded as new production methods and technologies emerge.

SECTION ONE

TRACTORS AND OTHER SELF-PROPELLED FARM EQUIPMENT

Tractors are the piece of machinery most commonly involved in farm accidents. Roll-overs account for about half of all fatal tractor accidents and are responsible for many disabling injuries and considerable property damage. About 85% of tractor upsets are side roll-overs; 14% are rear overturns, and 1% are front overturns. Most overturn fatalities occur with tractors that are not equipped with Roll-Over Protective Structures (ROPS).

This section covers the following topics:

Definitions

General Responsibilities

Factors to Consider When Operating a Tractor

- Training
- Before Starting a Tractor
- Operating Procedures
 - Roll-Over Protective Structures
 - Preventing Tractor Roll-Overs
 - General Precautions
- Hitching
- Attachments
- Refuelling
- Safety with Large Tractors

DEFINITIONS

Roll-Over Protective Structure (ROPS): A structure on a farm tractor or self-propelled machine that limits most equipment roll-overs to 90 degrees and protects the operator within the frame of safety if he/she is wearing the seatbelt.

Power Takeoff (PTO): A shaft that allows transmission of power from a farm tractor to a piece of equipment attached to it.

Self-Propelled Farm Equipment: A self-propelled vehicle manufactured, designed or re-designed for a specific use in farming.

Attachment: A piece of farm equipment that is pulled behind or mounted on to a tractor or other self-propelled farm equipment. Examples include ploughs, discs, wagons and cultivators.

Note: Throughout this document, where the term “tractor” is used it also refers to other self-propelled farm equipment.

GENERAL RESPONSIBILITIES

1. The employer shall provide information, instruction and supervision on how to safely operate a tractor.
2. A tractor and all attachments used with it must be maintained in good condition. This includes ensuring that all safety devices are operational. Maintenance records should be kept.
3. A tractor should be used for its intended purpose, as specified by the manufacturer and outlined in the operator’s manual.
4. If a tractor or any attachments are modified, the employer and the operator should take into account how the modifications affect the safe operation of the equipment.
5. All safety decals attached to a tractor should be visible and free from obstructing material. Damaged or missing safety decals should be replaced with new ones if available.
6. Only the operator should ride on a tractor while it is in use. If a tractor has a training seat, the seat should be used solely for that purpose.
7. Children and other bystanders should be kept away from tractors while they are operating.

FACTORS TO CONSIDER WHEN OPERATING A TRACTOR

The information in the rest of this section describes various hazards associated with using a tractor and recommends some precautions and preventive measures to be considered.

Training

1. The employer should ensure a worker operating a tractor is competent to do so.
2. The employer should ensure that an operator:
 - understands and is able to apply the instructions in the operator's manual before using the tractor for the first time;
 - is able to recognize related hazards and knows how to control them.

3. An operator should first practice using a tractor without any equipment attached to it, in a large, level area. A competent person should:
 - show the operator how to safely start the tractor and use each of the controls;
 - provide instructions from a safe distance while the tractor is operated.
4. After an operator has learned to use the tractor alone in a level area, the next step is to learn to operate it with equipment attached. An operator should gradually work into the more complex jobs of tractor operation.

Before Starting a Tractor

1. On a daily basis, the operator should conduct a circle check before starting the tractor.
2. On a regular basis, before starting the tractor, the operator should make the maintenance checks listed below. Workers shall report any defects they are aware of to the employer or supervisor.
 - Lubricant and fuel levels.
 - Radiator fluid level – this should be done when the tractor is cold. Extreme care should be used if the level must be checked when the radiator is hot.
 - Tire pressure.
 - Hydraulic leaks.
 - Fittings - tighten any that are loose.
 - Lights - ensure all are working and visible.
3. All shields and guards should be in place and operational.
4. A worker operating a tractor should:
 - follow instructions printed on safety decals attached to the tractor;
 - keep safety decals clean and free from obstructing material.
5. Before moving a tractor, the operator should ensure:
 - that wheel treads are set as wide apart as practical for the job;
 - there is clear visibility on all sides;
 - there is nothing in the tractor's intended path;
 - there are no hazards or obstructions such as overhead wires;
 - that the brakes work properly; and,
 - that, where applicable, brake pedals are locked together before traveling on a road.

6. A tractor should not be run indoors for extended periods of time as toxic gases can build up. Exhaust gases contain carbon monoxide, which is odourless, colourless and deadly. If a tractor is to be used indoors, there should be adequate ventilation or exhaust gases should be vented directly to the outside.
7. Proper techniques for mounting and dismounting equipment should be used to prevent slips and falls. The three point contact method should be used where possible. This involves maintaining contact with the machine with either two hands and one foot or two feet and one hand at all times while mounting or dismounting.

Operating A Tractor

Roll-Over Protective Structures (ROPS)

1. Under the Farm Implements Act, all new tractors and all used tractors manufactured after January 1, 1992, with a manufacturer's rating higher than 20 horsepower, and sold by a dealer, must be equipped with a Roll-Over Protective Structure and a seatbelt.
2. Where the danger of a roll-over exists, or when operating on a public roadway, a tractor should be equipped with a ROPS and a seatbelt should be worn.
3. Tractors may be operated without ROPS in situations where it is not practical to do so. This includes situations where there is low overhead clearance, such as in orchards, farm buildings, greenhouses and other locations where low profile tractors are necessary for a particular task. Extra care should be taken when operating a tractor in these situations.

Preventing Tractor Roll-Overs

A number of factors can contribute to a tractor roll-over, including uneven ground, operating on an incline, excessive speed or operating with a front-end loader or with raised attachments. Following the steps below will help prevent tractor roll-overs.

1. Tractor wheels should be kept as far apart as possible. A tractor will overturn sideways much more easily if the wheels are close together. When wheels must be moved in for narrow row farming, use extra precaution, especially when traveling at higher speeds on roads.
2. Whenever possible, an operator should avoid driving the tractor near ditches, embankments, holes and on steep slopes.
3. An operator should reduce speed before turning, when working on slopes, when using a loader and on rough, slick or muddy surfaces.

4. A slope of more than 30 degrees can change the centre of gravity of a tractor. When working on a slope, to ensure greater stability, an operator should drive straight up or down the slope, not diagonally across it.

When moving down a slope, an operator should:

- shift to the lowest gear and keep the tractor in gear to prevent freewheeling and excessive braking;
- never coast;
- take extra care carrying heavy, high, swaying or unstable loads.

When going up a slope, an operator should:

- ensure that the centre of gravity stays in front of the point of contact between the rear wheels of the tractor and the ground;
- try to back up if it is necessary to get up the incline;
- use weights on the front of the tractor if necessary.

5. Engage the clutch gently, especially when going uphill. “Jackrabbit” (sudden) starts are dangerous as the tractor may flip over.
6. When operating a loader, keep it as close to the ground as possible.

General Precautions

1. Disengage the Power Take-Off (PTO) when it is not in use. The power takeoff shield should be in place whenever equipment is in use.
2. Never jump from a moving tractor or leave a running tractor unattended. The tractor could start rolling or moving and run over you.
3. Do not wear loose clothing while operating a tractor. Loose clothing can catch on moving parts or levers and cause an accident.
4. If stuck in mud, try to back out. If this does not work, get another tractor to pull you out. The tractor pulling you out should be of sufficient size and power to do the job and should have roll-over protection and a seatbelt.
5. When parking a tractor, an operator should:
 - disengage the PTO;
 - lower equipment to the ground;
 - turn off the engine before getting off the tractor;
 - put the transmission into neutral or park;
 - set the brakes to prevent the tractor from rolling.

6. Under the Highway Traffic Act, a person operating a farm tractor on a public roadway shall be at least 16 years old. A tractor operator must also follow all traffic rules when on public roads. This includes having proper lights, using hand signals, having a slow moving vehicle sign (SMV) and observing the right-of-way.

Hitching

1. When a tractor is used for pulling loads, the point of pull on the tractor should be the point specified by the manufacturer's instructions, and the weight of the load pulled must not exceed that specified by the manufacturer.
2. Towed loads should only be hitched to the drawbar and at the manufacturer's recommended height.
3. When using the three-point hitch, front weights should be added, as necessary, to maintain stability and prevent steering problems. Loads that are hitched too high can cause a tractor to flip backwards.
4. Safety clips and pins designed for hitching should be used.
5. Any chain or cable used to pull an object should be in good condition and adequate for its intended use, in particular, it should be able to sustain the load to be pulled without breaking.
6. When a chain or cable is used to pull a load, any slack should be taken up slowly and there should be no loose chains dangling.

Attachments

1. All shields and guards should be in place and operational.
2. Equipment should not be operated if shields or guards are missing.
3. An operator should shut off the engine and be sure implement motion has stopped before performing any adjustments or maintenance.
4. For some attachments, counterweights should be used for stability.
5. An operator should raise any rear-mounted attachments and drive slowly when making sharp turns.
6. An operator should raise and lower attachments slowly and smoothly.

Refueling the Tractor

The following steps will reduce the risk of a fire or explosion when refuelling a tractor.

1. The tractor should be refuelled outside.
2. Store fuel outside of buildings.
3. The refuelling area should be free of flammable material.
4. Ground out the tractor by dropping mounted equipment to the ground or by using a ground wire in order to reduce static electricity. Static electricity, a spark from the ignition system, or a hot exhaust could cause the fuel to ignite.
5. An approved dry chemical extinguisher should be easily accessible while refuelling.
6. Never refuel the tractor while the engine is running or hot.
7. Do not smoke while refuelling.

Safety with Large Tractors

Safety precautions apply to both large and small tractors, but there are some special safety concerns when operating extremely large equipment. The employer has a duty to inform and instruct operators about the additional potential hazards.

Dimensions: The tractor's dimensions may cause difficulties in tight places, at corners and gates, and on narrow roadways. Overhead clearances, especially around power lines, may also cause a problem. An operator should be aware of the potential dangers. The weight of the unit should be considered when operating on small bridges, floors and flatbeds.

Steering: The unique steering systems of large 4-wheel-drive tractors can present handling problems. All-wheel steering can shift a towed device into an unexpected path. Articulated steering changes the tractor's center of gravity so that an overturn can occur unexpectedly. With articulated steering, high-speed road travel requires more operating skill than conventional tractors.

SECTION TWO

FARM EQUIPMENT

Farm equipment may include any mechanical or electrical device that transmits or modifies energy to perform a variety of tasks. Examples of farm equipment include balers, conveyors, manure spreaders, bale choppers, mowers, shredders, harvesters, grinders, blowers, power washers and augers. Hand tools are not covered in this section.

Section One, Tractors and Other Self-Propelled Equipment, addressed the hazards of operating a tractor with an attachment. This section addresses the hazards specific to the attachment. The following topics are covered:

Definitions

General Responsibilities

Hazards Associated With Equipment

- Shear Points
- Pinch Points
- Wrap Points
- Crush Points
- Pull-in Points
- Free-Wheeling Parts
- Springs
- Hydraulic Systems

DEFINITIONS

Power Takeoff (P.T.O.): A shaft that allows transmission of power from a farm tractor to a piece of equipment attached to it.

GENERAL RESPONSIBILITIES

1. The employer shall provide information, instruction and supervision to a worker operating farm equipment, to protect the health and safety of the worker.
2. Equipment must be maintained in good condition. All safety devices should be operational and maintenance records should be kept.
3. Farm equipment should be used for its intended purpose, as specified by the manufacturer and outlined in the operator's manual.

4. If farm equipment is modified, the employer and the operator should take into account how the modifications affect the safe operation of the equipment.
5. All safety decals attached to a piece of farm equipment should be visible and free from obstructing material. Damaged or missing safety decals should be replaced with new ones if available.
6. A lockout procedure should be developed and used for each piece of equipment to ensure that power cannot be engaged during repairs or adjustments to the equipment. (See Guideline on Lockout Procedures)
7. Shields and guards should be in place on all farm equipment as per the manufacturer's recommendations.
8. Equipment should be locked out before shields or guards are removed for maintenance purposes. Shields and guards should be re-installed before work is resumed.
9. If using a shield or guard prevents a piece of farm equipment from performing its intended purpose, the employer should guard against the hazard as much as possible, and use additional measures to protect workers. Examples of such additional measures include installing a warning device such as an alarm, developing alternate work procedures that would allow the task to be performed safely, or providing personal protective equipment.

HAZARDS ASSOCIATED WITH EQUIPMENT

Although there are many different types of farm machinery, they tend to have similar characteristics and parts, such as:

- cutting edges,
- gears,
- chains,
- levers,
- revolving shafts, and
- rotating blades.

The main hazards associated with exposure to these parts are described below.

Shear/Cutting Points

1. Shear points are created when the edges of two objects are moved close enough together to cut a material, as in the case of a pair of shears or an auger.

2. Cutting points are created when a single object moves forcefully or rapidly enough to cut, as in the case of a sickle blade.
3. They are hazards because of their cutting force, and because they often move so rapidly that they may not be visible.
4. Workers should be aware of shear points, and shields or guards should be used to prevent exposure or access.

Pinch Points

1. Pinch points are formed when two objects move together and at least one of them is moving in a circle. For example, the point at which a belt runs onto a pulley is a pinch point. Belt drives, chain drives and gear drives are other examples of pinch points in power transmission devices.
2. Body parts such as fingers, hands and feet can be caught directly in pinch points, or they may be drawn into the pinch points by loose clothing that becomes entangled.
3. Workers should be aware of pinch points, and shields or guards should be used to prevent exposure or access.

Wrap Points

1. Rotating shafts are the most common source of wrap point accidents, although any exposed machine part that rotates can be a wrap point. Clothing or hair can catch on a rotating part.
2. The ends of shafts that protrude beyond bearings are also dangerous. Universal joints, keys and fastening devices can also snag clothing.
3. Entanglement with a wrap point can pull you into the machine, or clothing may become so tightly wrapped that you are crushed or suffocated.
4. Workers operating machinery should be aware of wrap points and wear clothing that will not become entangled in moving components. In addition, where possible, shields or guards should be used to prevent access.

Crush Points

1. Crush points are created when two objects move toward each other or one object moves toward a stationary one. For example,

- hitching a tractor to an attachment may create a potential crush point; or,
 - failure to block up equipment safely can result in a crushing injury.
2. Crushing injuries most commonly occur to fingers. To prevent a crushing injury, workers should:
- be aware of crush points and avoid potentially dangerous situations;
 - arrange the hitch point so that a tractor can be backed into position without a worker being in the path;
 - wait until a tractor has stopped before stepping into the hitching area; and,
 - block any machine that can move before working under or near it.

Pull-In Points

1. Pull-in points usually occur when plant material or other obstacles become stuck in feed rolls or other machinery parts, preventing the mechanism from operating. A worker trying to free such material without shutting down or locking out the power can be rapidly pulled into the mechanism when the material is freed.
2. Equipment operators should always shut off the power and use a lockout procedure before attempting to clear plugged equipment. (See Guideline on Lockout Procedures)

Free-Wheeling Parts

1. Many machine parts continue to spin after the power is either shut off or locked out. Even if equipment is locked out, no repair or maintenance work should be started until all parts have stopped moving. This may take as long as 2 – 2.5 minutes. Examples of free-wheeling parts include:
 - cutter heads of forage harvesters,
 - hammer mills of feed grinders,
 - rotary mower blades,
 - fans, and
 - flywheels.

Springs

1. Springs are commonly used to help lift equipment such as shock absorbers, and to keep belts tight and may harbour potentially dangerous stored energy.

2. Springs under compression will expand with great force when released while those that are stretched will contract rapidly when released.
3. A worker should know in which direction a spring will move and how it might affect another machine part when released, and stay out of its path.

Hydraulic Systems

1. Hydraulic systems store considerable energy. They are used to:
 - lift and change the position of attachments;
 - operate hydraulic motors; and,
 - assist in steering and braking.
2. Leaks from hydraulic systems are a serious hazard because of the high pressure and temperature of the fluid contained in the system. Even fine jets of hydraulic fluid can burn or pierce skin and tissue. Workers should:
 - never inspect hydraulic hoses with their hands;
 - wear long sleeves, heavy gloves and safety glasses when checking for leaks;
 - follow the instructions in the operator's manual because the specific procedures for servicing these systems are very important for one's safety.
3. Where appropriate, a properly qualified and certified mechanic should perform repairs and maintenance.
4. Work should not be performed under raised hydraulic equipment.

SECTION THREE

LARGE ANIMAL HANDLING

On average, two people die every year in accidents involving animals on Ontario farms. Inadequate animal handling facilities and poor animal handling methods increase the likelihood that accidents will occur. Animals are also the source of some infectious diseases that can be spread to humans. Handlers must always be on guard when working with or around animals. This section covers the following topics:

Definitions

General Responsibilities

Animal Handling Hazards

Factors to Consider When Handling Large Animals

Background – Animal Characteristics and Behaviour.

DEFINITIONS

Large Animal: For the purposes of this section, large animals include but are not limited to, cattle, hogs, deer, sheep, horses and goats.

Zoonoses: A disease such as rabies that can be transmitted from animal to human.

GENERAL RESPONSIBILITIES

1. The employer shall provide information, instruction and supervision to a worker handling large farm animals and shall ensure that the worker is competent to do so safely.
2. A worker coming into contact with an animal should wear appropriate personal protective equipment for the assigned work. (*See Guideline on Personal Protective Equipment*)
3. A worker coming into contact with an animal should be made aware of any transmittable diseases that the animal may carry and should be instructed on how to prevent transmission, to themselves and to other animals. (*See Guideline on Occupational Illness*)
4. An employer should ensure that workers know how to safely separate themselves from an animal while working in an enclosure occupied by animals.

ANIMAL HANDLING HAZARDS

Farm employers and workers handling large animals can be killed or injured in a number of ways, including being:

- stepped on,
- knocked down,
- kicked,
- bitten,
- pinned against a hard surface, or
- exposed to a transmittable disease.

FACTORS TO CONSIDER WHEN HANDLING LARGE ANIMALS

The measures set out below are general factors that employers and workers should take into account to reduce the likelihood that an animal will behave in an unpredictable or aggressive way and thereby endanger either people or other animals nearby.

1. The employer should ensure that proper equipment and facilities are available for housing and handling the type of animals in the operation with attention to:
 - good housekeeping practices;
 - equipment, fencing and gates that are able to restrain animals safely for general maintenance or health care;
 - walking or working surfaces that are even and finished or constructed to prevent slipping under wet conditions;
 - even and diffused lighting; and,
 - alleys and chutes that are wide enough for animals to pass but not to turn around.
2. When approaching an animal, handlers should announce their presence by voice or by being clearly visible and gently touching the animal on the front or side.
3. Handlers should be aware of and avoid an animal's kicking region.
4. Noise and yelling should be kept to a minimum when working with livestock to enable the animal to feel secure.
5. When handling livestock with young, allow them to remain as close to their offspring as possible.

BACKGROUND – ANIMAL CHARACTERISTICS AND BEHAVIOUR

The points below are provided for information purposes only and may help those handling large animals to understand why certain precautions are necessary.

Animal Vision

Workers should be aware of the limitations of vision of the particular animal that they are working with. Animals may have:

- colour blindness;
- poor depth perception;
- sensitivity to contrasts, which may cause them to balk or hesitate at sudden changes in lighting (shadows), colour or texture;
- difficulty in picking out small details;
- sensitivity to distractions or sudden movement because of wide angled vision;
- a natural tendency to move from dimly lit areas to lighter areas;
- blind spots where they cannot see a worker.

Animal Hearing

Loud, abrupt noises can cause distress in livestock. Reduction of noise levels will have a calming effect on animals.

Maternal Instincts and Territorial Behaviours

Livestock with young exhibit a maternal instinct. They are usually more defensive and difficult to handle.

Most animals have a strong territorial instinct and develop a very distinctive attachment to certain areas such as pastures, buildings, water troughs and worn paths. Forceful removal from familiar areas can cause animals to react unexpectedly. Similar problems occur when animals are moved away from feed, separated from the herd or approached by an unfamiliar person.

Kicking and Biting

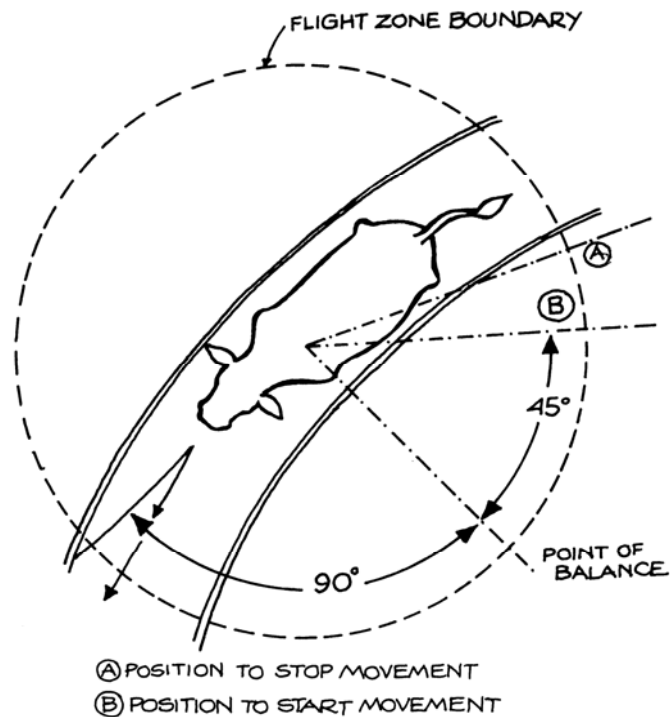
Each type of animal kicks differently. Some of the reasons animals kick include:

- pain, injury, or inflammation,
- something in their blind spot,
- sudden noise.

Animals may signal their intention to kick. For example, ears that are "laid back," or flattened backward, warn you that a horse is getting ready to kick or bite.

Approaching Animals

Most animals, like humans, have a comfort zone. The illustration below is specific to cattle but the principles apply generally to other animals as well.



A **comfort or flight zone** can be used to effectively move cattle and other animals. This works best when the handler works at the edge of the flight zone. These zones will vary from animal to animal and can be anywhere from five to twenty-five feet. Deep invasion into the flight zone may cause panic and confusion. Learning the principles of using the flight zone will allow a handler to move the herd safely.

SECTION FOUR

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) should be used to reduce or prevent a worker's exposure to health and safety hazards on a farming operation. There are many different types of PPE including respirators, safety boots, goggles, ear plugs/muffs, hard hats, gloves, chaps and fall arrest devices.

This section covers the following topics:

Definitions

General Responsibilities

Types of Personal Protective Equipment

- Hearing Protection
- Respiratory Protection
- Eye Protection
- Foot Protection
- Hand Protection
- Head Protection
- Body Protection
- Fall Protection

DEFINITIONS

Material Safety Data Sheet (MSDS): A document that contains information about a hazardous substance, including the potential health effects of exposure and how to handle the substance safely. Material Safety Data Sheets are generally available from the supplier of the product.

GENERAL RESPONSIBILITIES

1. The employer shall ensure that PPE is used where appropriate.
2. The employer shall provide information, instruction and supervision to workers on the proper use and maintenance of PPE. Instruction should include, but not be limited to:
 - how to properly fit and wear PPE;
 - when PPE should be worn;
 - how to care for PPE and identify when it requires repair, cleaning or disposal;
 - how PPE provides protection and the consequences of not wearing it.

2. The employer should assess each work process and job task on the farm and determine where PPE may be needed to protect workers. PPE should be used as a last resort if the hazard cannot be controlled by other means such as engineering controls, (for example, ventilation), redesign of work processes, or using less toxic substances.
3. The worker shall use PPE provided by, and as required by, the employer.
4. Where a chemical or other hazardous product endangers the health or safety of a worker, PPE should be worn according to the product manufacturer's instructions on either a warning label or MSDS.
5. The employer should monitor the use of PPE to ensure that it provides adequate protection for the worker and does not cause undue discomfort or create new hazards while being used.
6. The worker shall inform the employer of any defects in the PPE, which the worker is aware of and which could endanger the worker.

TYPES OF PERSONAL PROTECTIVE EQUIPMENT

Hearing Protection

1. Hearing protection should be worn in work environments where noise levels exceed 85 decibels.

In limited circumstances, a worker may be exposed to noise levels above 85 decibels without wearing hearing protection, but the acceptable duration of such an exposure will vary depending upon the noise level (in decibels).

2. There are many types of hearing protection, including earplugs or muffs. Hearing protection that is suitable for the work environment and provides adequate noise reduction should be chosen.

Respiratory Protection

There are many types of respirators available to protect against a variety of atmospheric hazards. It is important that the respirator being used for a particular job protects against the hazard in question. ***Using the wrong respirator can be as dangerous as not wearing one at all.*** All respirators must fit well and provide a proper seal with the wearer's face in order to provide adequate protection.

1. Disposable respirators should be used where dusts, mists and fumes may be present. They must not be used in oxygen deficient atmospheres.

2. Chemical cartridge respirators should be used to filter out gases and organic vapours. These respirators are hazard-specific, meaning that a cartridge designed to filter out a particular gas will not protect a worker from exposure to a different gas. They must not be used in oxygen deficient atmospheres.
3. Powered air purifying respirators should be used where there may be excessive dust levels or pesticides. These respirators:
 - have replaceable cartridges that are hazard-specific
 - are operated by battery
 - have a constant air flow, facilitating breathing
 - must not be used in oxygen deficient atmospheres.
4. Gas masks should be used for high concentrations of specific gases. They usually have a full face piece and canister attached. They must not be used in oxygen deficient atmospheres.
5. Supplied air respirators should be used in highly toxic and oxygen deficient atmospheres. Users should be well trained. Such equipment:
 - comes with the air supply in a tank
 - comes with a small emergency bottle
 - has positive pressure for use in toxic atmospheres
 - should never be used alone
 - should be used according to confined space entry procedures.

(See Guideline on Hazardous Atmospheres and Confined Spaces)

Eye Protection

Eye protection should be used where there is a danger of flying objects, particles, liquids, sprays or other matter entering the eyes. Protection can take many forms including:

- safety glasses,
- goggles, or
- full face protection.

Foot Protection

Foot protection is usually in the form of steel-toed work boots, with a steel shank to protect the bottom of the foot from puncture wounds. In wet environments, steel-toed boots that are waterproof and slip-resistant may be necessary. The hazards that workers are exposed to will determine what type of foot protection is most appropriate for the job.

Hand Protection

Gloves offer good protection for the hands. They may be made of many different materials – cotton, leather, rubber, or other materials impervious to liquids. Gloves should be chosen for the specific hazard and job task.

Head Protection

Hard hats, bump caps, or helmets are types of protection that should be considered if there is a hazard of head injury. Head injuries can occur under various circumstances including as the result of a slip or fall, working with unpredictable animals, working in confined areas or where there are low ceilings or where there may be falling objects.

Body Protection

Body protection may be required in various situations including dusty environments or when spraying liquid pesticides or handling dangerous chemicals. The hazard to be controlled will determine the type of protection that is most appropriate, for example, an apron, coveralls or a full rain suit.

When using a chainsaw, protective chaps or leg protection should be worn.

Fall Protection

Fall protection includes the use of safety belts, harnesses and lifelines to prevent injury due to a fall from a height. (*See Guideline on Falls, Slips and Trips*)

SECTION FIVE

FALLS, SLIPS AND TRIPS

This section deals with the protection of workers from falls, slips and trips and covers the following topics:

Definitions

General Responsibilities

Factors to Consider in Fall Prevention

- Falls From Heights;
- Working with Ladders;
- Eliminating Slips and Trips on a Level Surface; and,
- Taking Extra Care Around Machinery.

DEFINITIONS

Fall Protection System: A system designed to protect workers from the risk of falling between levels when working at heights. Examples of fall protection systems include safety harnesses and lifelines; the use of guardrails or barriers; and, travel restraints that limit a worker's movement to a safe area.

Guardrail System: Means an assembly of components joined together to provide a barrier to prevent a worker from falling from the edge of a surface.

Three Point Contact Method: Refers to maintaining contact with either two hands and one foot or two feet and one hand at all times.

GENERAL RESPONSIBILITIES

1. The employer shall provide information, instruction and supervision to protect the safety of workers who may be injured by falling:
 - from a height within a structure;
 - from a ladder;
 - through openings in a work surface;
 - while working on a level surface; or
 - while working on and around machinery.
2. The employer and supervisor should ensure that a worker who uses a fall protection system to prevent a fall is adequately instructed in its use by a competent person.

3. The employer and supervisor should ensure that a fall protection system is used whenever a fall from a height involves a risk of injury and that the components of the fall protection system are adequate to protect the worker.
4. The employer, supervisor and workers should keep work surfaces clear of slip and trip hazards to the greatest extent possible.
5. Workers should:
 - follow the instruction and training provided by the employer;
 - learn to recognize potential slip and trip hazards;
 - report to their supervisor, anything they feel could be a threat to sound footing.

FACTORS TO CONSIDER IN FALL PREVENTION

Falls From Heights

1. The employer should develop safety procedures for each job task that requires a worker to work at a height greater than three metres.
2. Each procedure should outline specific safety precautions to be taken to protect the worker from a fall. The employer should instruct workers in these procedures and review them before a worker starts the task.
3. Where there is a hazard of falling between levels or floors within a building or structure, a guardrail system should be provided as the primary means of fall protection. The guardrail system should be constructed to withstand all loads applied to it.
4. If a guardrail system cannot be installed, the employer should provide adequate protection to protect the worker from a fall.
5. The employer should provide adequate protection when a guardrail system has to be removed temporarily to perform work. The employer may consider:
 - providing an alternate means of fall protection that will not allow a worker to fall onto either the ground or another level or object below the work;
and,
 - ensuring that the alternate means of fall protection is used by the workers;
and,
 - posting warning signs.
6. Trap doors and feed “throw down” holes should be covered when not in use.

7. Guardrails should be installed around clean-out openings in multi-floored confinement houses and other such structures when the openings are not in use.

Working With Ladders

1. The employer should ensure that a portable ladder has non-slip feet, is placed on firm footing, and has no broken or loose members or other faults.
2. If it is necessary to work on a ladder for an extended period of time, without changing location, the employer should try to provide scaffolds or other work platforms to reduce the risk of falling.
3. When a portable ladder exceeds six metres in length, and is not securely fastened or is likely to be endangered by traffic, it should be:
 - held in place by one or more workers while being used; **and**,
 - inclined so that the horizontal distance from the top support to the foot of the ladder is not less than one quarter and not more than one third of the length of the ladder.
4. The employer should ensure that an orchard ladder is appropriate for the task, and that the worker is instructed in its proper use. When necessary for safety, the feet of the ladder should be equipped with steel points or other non-slipping bases designed for the surface on which the ladder will be used.
5. Where a worker climbs the outside of a structure such as a silo or grain bin on an access ladder fixed in position, the ladder should have a safety cage installed to protect the worker. In the absence of a safety cage, other means of fall protection should be used, for example, the three-point method of contact while climbing.

Eliminating Slips and Trips on a Level Surface

1. All aisles and walkways should be kept free of clutter and debris.
2. Oil spills and other slippery materials should be cleaned up immediately.
3. Areas that are slippery because of the continuous use of water – common in the floriculture industry – should be off-limits as general traffic areas and restricted to those workers who must perform their duties in that area.
4. Workers should put tools away when they are no longer needed.
5. Sand and/or salt should be spread on icy surfaces if work has to be done in the vicinity. If the weather is particularly bad, consider putting the job off until conditions improve.

6. Workers should wear safety footwear, appropriate for the work being done, to prevent slipping and falling on walking surfaces.

Taking Extra Care Around Machinery

Slips, trips and falls around farm equipment can have fatal consequences. Here are some additional points to consider when working with machinery.

1. Workers should never jump from a tractor. There is always the danger of catching clothing on pedals, levers, or other protruding parts. They could land on an uneven surface and injure their ankles, legs, or back.
2. Workers should be instructed on the proper techniques for mounting and dismounting equipment. They should always use handrails, handholds, and steps to mount or dismount tractors and self-propelled equipment. Workers should follow the 3-point system--either two hands and one foot, or one hand and two feet on the machine at all times.
3. Never operate equipment from any position other than the operator's seat or control area.
4. The equipment operator should never allow passengers to ride along. They are much more likely to fall from a machine when it is moving.
5. Steps and platforms of tractors and other machinery should be kept clean and dry. Take the time to clean off mud, ice, snow, manure, grease, and other debris that can accumulate on these surfaces. Do not carry tools, chains, or other equipment on the platform.

SECTION SIX

LOCKOUT PROCEDURES

There are many types of potentially hazardous energy including, electrical, thermal, chemical, pneumatic, hydraulic, mechanical and gravitational energy. All such forms of energy must be locked out, blocked or released to ensure that machinery or equipment does not turn on or move during installation, repair or maintenance.

This section covers the following topics:

Definitions

General Responsibilities

Factors to Consider When Locking Out Equipment

- Lockout Procedures
 - Preparation
 - Machine or Equipment Shutdown and Isolation
 - Application of Lockout/Tagout
 - Verification of Isolation
 - Lockout/Tagout Interruption
 - Release from Lockout/Tagout
- General Lockout Recommendations for Servicing Farm Equipment
- Lockout for Hydraulic Systems

DEFINITIONS

Energy Isolating Device: A disconnect switch, circuit breaker, manually operated valve, blind flange, or other device used to ensure that power or energy cannot flow to a piece of machinery or equipment.

GENERAL RESPONSIBILITIES

1. The employer shall provide information, instruction and supervision to workers on proper lockout procedures for each piece of equipment they will be operating.
2. An initial review should be made to determine which switches, valves, or other energy isolating devices apply to the equipment being locked out. More than one energy source (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravitational) may be involved.
3. The employer should ensure that workers know which energy sources may need to be controlled. Workers should check with a supervisor or other

4. When equipment is to be locked out, employers, supervisors and workers should follow accepted lockout principles, including:
 - Pre-planning for the lockout by identifying all energy sources, switches, etc.
 - Where lockout is complex, a written sequence in checklist form should be prepared for equipment access, lockout/tagout, clearance, release and start-up.
 - All workers affected by the lockout should be notified.
 - Equipment should be shut down by normal means by turning of switches and closing valves etc.
 - Equipment should be isolated from energy sources by disconnecting or blocking the sources of energy.
 - Lockout and tag the energy isolating devices by padlock or some other locking device that the worker has control over as well as a tag indicating that the equipment has been shut down.
 - Verify that all energy sources have been isolated by attempting to cycle the equipment prior to working on it.
 - When work is completed, release equipment from lockout.
 - Test equipment.

FACTORS TO CONSIDER WHEN LOCKING OUT EQUIPMENT

Lockout Procedures

Preparation

1. Notify all affected workers that a lockout is required and the reason for the lockout.

Machine or Equipment Shutdown and Isolation

1. If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.). Only workers knowledgeable in the operation of the specific equipment should perform shutdown or re-start procedures.
2. Operate the energy-isolating device(s) so that all energy sources (electrical, mechanical, hydraulic, etc.) are disconnected or isolated from the equipment.
3. Electrical disconnect switches should never be pulled while under load, because of the possibility of arcing or even explosion.
4. Stored energy, such as that in capacitors, springs, elevated machine parts, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be released, disconnected, or restrained by methods such as grounding, repositioning, blocking or bleeding-down.
5. Pulling fuses is not a substitute for locking out. A pulled fuse is no guarantee the circuit is dead. Even if a circuit is dead, another person could inadvertently replace the fuse.
6. Equipment that operates intermittently, such as a pump, blower, fan or compressor may seem harmless when it is not running. Do not assume that because equipment is not operating at a particular point in time that it will remain off for the duration of any work to be performed on it.

Application of Lockout/Tagout

1. Lock out and tag the energy-isolating device with an assigned, individual lock. A worker will not be protected unless he/she uses his/her own padlock.
2. If more than one worker is working on the same piece of equipment at the same time, each one should lock out the equipment, by placing a personal lock and tag on the group lockout device when he/she begins work, and should remove those devices when he/she stops working on the machine or equipment.
3. Locks and tags should clearly show the name of the person who applied the device, the date, and the reason for the lockout. This identifies who is servicing the machinery or equipment. In a multiple lockout/tagout situation, it will also identify any worker(s) who may not have finished working.
4. Locks and tags must be durable enough to withstand the environment in which they are to be used. Information on the locks and tags should remain legible.

5. Locks must be substantial enough to prevent removal without the use of excessive force. Tags must be substantial enough to prevent accidental or inadvertent removal.
6. Both locks and tags are to be standardized by colour, shape, or size. Tags should be easily recognized and provide appropriate information about the lockout.
7. For some equipment it may be necessary to construct attachments to which locks can be applied. An example is a common hasp to cover an operating button. Tags must be attached to the energy isolating device(s) and to the normal operating control in such a manner as to prevent operation during the lockout.

Verification of Isolation

1. After ensuring that no workers can be injured, operate the push button or other normal controls to verify that all energy sources have been disconnected and the equipment will not operate.
2. If there is a possibility of re-accumulation of stored energy, such as an increase in pressure to a hazardous level, isolation of the equipment must be periodically verified until the maintenance or repair is completed, or until the possibility of such accumulation no longer exists.
3. Return operating controls to neutral position after the test. A check of system activation (e.g. use of voltmeter for electrical circuits) should be performed to ensure isolation.
4. The equipment is now locked out.

Lockout/Tagout Interruption

1. If a machine is locked/tagged and there is a need for testing or positioning of the equipment/process, the following steps should be followed:
 - Clear the equipment/process of tools and materials.
 - Ensure workers are a safe distance from any potential hazard.
 - Remove locks/tags according to established procedure.
 - Proceed with test.
 - De-energize all systems and re-lock/re-tag the controls before resuming work.

Release From Lockout/Tagout

1. Before locks and tags are removed and energy is restored to the machine or equipment, inspect the work area to ensure that non-essential items have been removed and that machine or equipment components are operationally intact.
2. Ensure workers are a safe distance from any potential hazard.
3. Each lock and tag should be removed from each energy-isolating device by the worker who applied the lock and tag.
4. Notify affected workers that locks and tags have been removed.

General Lockout Recommendations for Servicing Farm Equipment

1. Disengage the power and stop the machine before servicing.
2. Do not clean, unplug, lubricate, adjust or repair any machine while it is running, unless it is specifically recommended in the service or owner's manual.
3. Lock out the ignition and put a warning sign over the ignition that tells everyone that you are working on the machine.
4. Engage safety locks if the hydraulic cylinders are so equipped.

Lockout for Hydraulic Systems

1. Workers should always follow instructions in the operator's manual for servicing hydraulic systems. Where appropriate, a properly qualified and certified mechanic should perform repairs and maintenance.
2. Shut off the engine that powers the hydraulic pump.
3. Lower implement to the ground or onto a solid support.
4. Move the hydraulic lever back and forth several times to relieve pressure.
5. When applicable, blanking devices should be used.

SECTION SEVEN

HAZARDOUS ATMOSPHERES AND CONFINED SPACES

There are many examples of potentially dangerous confined spaces on a farm, including silos, grain bins, manure pits and spreaders, mixing or holding tanks, cisterns, valve pits and pump houses. Farmers and workers who enter a confined space, and those who attempt a rescue in an emergency, could quickly be overcome by a hazardous atmosphere, resulting in injury or death. For example, even a few seconds of oxygen depletion can impair brain cell function. This in turn may result in confusion and poor judgement and may compromise a worker's ability to exit the space.

This section covers the following topics:

Definitions

General Responsibilities

Factors to Consider When Working Around Manure Storage and Silos

- Manure Storage Entry Procedures
- Working Safely In and Around Silos

Background

- Characteristics of Manure Gases
 - Hydrogen Sulfide
 - Ammonia
 - Carbon Dioxide
 - Methane
- Characteristics of Silo Gases

DEFINITIONS

Hazardous Atmosphere: An atmosphere is hazardous when:

- it has too much or too little oxygen; or,
- it contains flammable, combustible or explosive agents; or,
- it contains contaminants (for example, fumes, dusts, mists) that could pose an immediate threat to life or interfere with a person's ability to escape unaided from a confined space.

Confined Space: A fully or partially enclosed space that is not designed and not built for continuous human occupancy and, which may contain a hazardous atmosphere because of its construction, location, contents, or because of work that is done in it. Entry to, and exit from a confined space may be difficult or restricted. A confined space may be part of a structure or may be mobile or portable such as a manure spreader tank.

GENERAL RESPONSIBILITIES

1. The employer shall provide information and instruction to workers on potentially hazardous confined spaces and work areas that may contain hazardous gases, and the appropriate procedures when working in these areas.
2. For each area where a hazardous atmosphere or confined space may exist, the employer should develop a written plan to protect workers and shall communicate the plan to workers.
3. The supervisor shall ensure that a worker uses or wears any personal protective equipment that the employer requires to be worn; and, that workers follow any written plans and procedures developed by the employer.
4. Workers should not enter confined spaces or hazardous atmospheres when there are no written plans or procedures for working in these areas.
5. A worker should not enter or remain in a building or structure adjoining a liquid manure tank while the manure is being agitated. Following agitation of the manure, any adjoining building or structure should be thoroughly ventilated before a worker is permitted to re-enter it.
6. A worker should not enter a grain bin or silo where grain is stored while the grain is being unloaded. The greatest danger of death in this situation is from becoming trapped in flowing grain. By locking out the unloader before entering a grain bin or silo with grain, the hazard of entrapment is greatly reduced.
7. When a worker is required to enter a controlled atmosphere storage warehouse that cannot be purged, the worker must be informed of the risk of entering such a facility without respiratory protection and be properly equipped with a breathing apparatus that allows safe entry.

FACTORS TO CONSIDER WHEN WORKING AROUND MANURE STORAGE AND SILOS

Manure Storage Entry Procedures

1. Avoid entering manure storage areas if at all possible. Many deaths have occurred when people entered manure storage areas without proper safety precautions. Even small amounts of manure can produce toxic gases. A pit may not be safe even if it has only a foot of liquid in it.
2. If you must enter a manure storage area, wear a self-contained air supply like those fire fighters use. (Dust masks or other cartridge respirators will not filter

3. Never enter a manure pit during or just after agitation because there is always the possibility of deadly concentration of gases. Plumbing and pumping equipment should be installed so that it can be easily removed for repairs.
4. Before agitation, workers and animals should be a safe distance away.
5. Remove all people and animals if possible. If animals cannot be removed, maximize ventilation and agitate slurry very slowly at first. Monitor the condition of the animals. If the animals are restless, agitated or behaving abnormally, stop the agitation immediately and ventilate the area.
6. Always keep at least one foot of space between the highest manure level and the slats. This protects animals that lie on the slats and inhale the gases that accumulate at the surface of the pit. The greater the space between the surface of the manure and the slats, the lower the risk of animals inhaling the gases.

Working Safely In and Around Silos

1. Be alert for silo gas odours and/or yellowish-brown or reddish fumes in or near the silo. Silo gas is heavier than air and will displace oxygen.
2. The greatest danger from nitrogen dioxide gas from silage is during the first 12 to 60 hours after filling. However, take care to avoid possible exposure for 10 days after filling the silo and when opening the silo for feeding.
3. If gases are detected, do not enter the silo for up to six weeks after filling stops.
4. Workers should not enter a silo without a self-contained breathing apparatus and a safety harness attached to a life-line, especially during the danger period when gases may still be forming. Gases can form in the silo for up to six weeks after filling.
5. If a worker has to enter a silo, there should be another person/attendant outside to help if needed. Keep a hatch door open near the level of the silage within the silo.
6. Post all appropriate warning signs. Oxygen-limiting silos require a sign that warns people of the absence of oxygen. People need to be told to stay away from these areas and to only enter them with appropriate training and personal protective equipment.

BACKGROUND

1. Characteristics of Manure Gases

The four main gases produced from decomposing manure are hydrogen sulfide, methane, ammonia and carbon dioxide. In high concentrations, each of these gases may pose an immediate threat to life or health of humans and livestock.

In animal housing facilities, where the manure pit is often located below the facility floor, manure gases may always be present in low concentrations. When pits are agitated for pumping, some or all of these gases are rapidly released from the manure and may reach toxic levels or displace oxygen, increasing the risk to humans and livestock.

The primary hazards of these gases are toxic or poisonous reactions in people or animals, oxygen depletion that can result in asphyxiation, and explosions that can occur when oxygen mixes with gases such as methane.

Hydrogen Sulfide

Hydrogen sulfide is considered the most dangerous of the by-products of manure decomposition. It has a distinct rotten egg smell.

At low concentrations, hydrogen sulfide irritates the eyes and respiratory tract while at moderate levels, it causes headache, nausea, and dizziness. At high concentrations, hydrogen sulfide paralyzes the nerve cells of the nose to the point where the person can no longer smell the gas.

Hydrogen sulfide is heavier than air and will tend to settle to the lower areas of a storage facility. It can remain in high concentrations even after ventilation.

Ammonia

Ammonia has a distinct, sharp, penetrating odour detectable at very low concentrations. It is heavier than air and can irritate the eyes and respiratory tract at moderate concentrations. At high concentrations, it can cause ulceration of the eyes and severe irritation of the respiratory tract.

Carbon Dioxide

Carbon dioxide is a by-product of manure decomposition and livestock respiration. It is heavier than air and difficult to detect. It replaces oxygen in air and can act as an asphyxiate. At moderate concentrations, it causes shortness of breath and dizziness.

It is a major contributing factor to animal deaths by asphyxiation when animals are housed in buildings with faulty ventilation.

Methane

Methane is odorless and lighter than air, so it tends to accumulate at the top of covered manure pits. It is considered to be an asphyxiate at extremely high concentrations. Another key hazard associated with methane is its flammable, explosive nature. Methane is extremely difficult to detect without gas detection instruments but it should be anticipated as being present in all manure storage areas.

2. Characteristics of Silo Gases

Silo gas is formed by the natural fermentation of chopped silage shortly after it is placed in the silo.

Though a variety of gases are released during this process, the type of silo in which the forage is stored is important in determining which gas will be predominant. For instance, in sealed silos both nitrogen dioxide and carbon dioxide are created but carbon dioxide is produced in far greater amounts. This is desirable because high carbon dioxide levels help to maintain high quality silage.

At the same time, however, this odorless and colorless gas is dangerous. This gas replaces the silo's oxygen and, in high concentrations, it gives a person little warning that he or she is about to be overcome. Because of this hazard, sealed silos are designed in such a way that entering them is unnecessary.

Nitrogen Dioxide

A variety of gases are also formed in conventional or open-top silos but nitrogen dioxide is found more abundantly. This highly toxic gas is characterized by a strong bleach-like odour and low lying yellow, red, or dark brown fumes.

Unlike carbon dioxide, nitrogen dioxide levels reach a peak about three days after harvesting and rapidly begin to decrease thereafter, particularly if the silo is ventilated. After two weeks, it is unlikely that more gas will be produced, although some hazard remains if the gas has not been able to escape the silo.

Nitrogen dioxide is harmful because it causes severe irritation to the nose and throat and may lead to inflammation of the lungs. What makes this gas especially dangerous is that low level exposure to it is accompanied by only a little immediate pain or discomfort, yet death can occur immediately.

A farmer might breathe the gas without noticing any serious ill effects and then die in his sleep hours later from fluid collecting in his lungs.

Also, many victims suffer relapses with symptoms similar to pneumonia two to six weeks after the initial exposure. For these reasons, it is extremely

important for anyone who is exposed to this gas, even for a short time, to seek immediate medical attention.

Like carbon dioxide, nitrogen dioxide is heavier than air. As it is produced, it tends to settle right on top of the silage or flow down the silo chute and collect in the adjoining feed rooms or other low lying areas near the base of the silo.

Gas may even flow into the barn itself and become trapped in corners, under feed bunks, or lie low against the floor. The threat that this poses to livestock is a serious one.

For more information about the health effects of manure and silo gases, visit the Canadian Centre for Occupational Health and Safety (CCOHS) web site at www.ccohs.ca

SECTION EIGHT

OCCUPATIONAL ILLNESS

In addition to safety hazards on a farm, such as tractors, harvesters or balers, there are also *health* hazards that can cause a work-related disease. The main workplace health hazards are biological, chemical and physical agents. Exposure to such agents can have serious and immediate consequences; or, they can cause long-term, chronic conditions.

This section covers the following topics:

Definitions

General Responsibilities

- Biological Agents
- Chemical Agents
- Physical Agents
- Ergonomic Hazards

DEFINITIONS

Occupational Illness: A condition that results from exposure in a workplace to a physical, chemical or biological agent to the extent that the normal physiological mechanisms are affected and the health of the worker is impaired. It includes an occupational disease for which a worker is entitled to benefits under the Workplace Safety and Insurance Act, 1997.

Biological agents include such organisms as bacteria, viruses, fungus, parasites, spores and moulds. They may be found in or on soil, water, organic matter, plants and animals.

Chemical agents can include such things as battery acid, solvents, ammonia and pesticides.

Physical agents include various forms of energy that may harm a worker, for example, heat, cold, light, vibration, noise and radiation.

Ergonomic hazards are associated with work such as lifting or moving of heavy objects and tasks where there is excessive repetitive motion.

Personal protective equipment (PPE) is used to reduce or prevent a worker's exposure to health and safety hazards. There are many different types of PPE including respirators, gloves, safety boots, goggles, ear plugs/muffs, hard hats, chaps and fall arrest devices. (See Guideline on Personal Protective Equipment)

GENERAL RESPONSIBILITIES

1. The employer shall provide information, instruction and supervision to workers exposed to hazardous biological, chemical or physical agents.
2. The employer should carry out an assessment of the workplace and determine the risk that workers will be exposed to hazardous biological, chemical or physical agents and develop a plan for controlling worker exposure.
3. Where workers are exposed to hazardous biological, chemical or physical agents, and it is not possible to control exposure by means such as substituting a safer material, or re-designing the work process, the employer and supervisor should ensure the use of appropriate personal protective equipment. For chemical agents, the protective equipment required will generally be identified on either the product label or material safety data sheet, where available.
4. The employer should instruct workers on safe handling procedures and proper personal hygiene techniques to minimize contact with chemical or biological hazards.

Biological Agents

1. The employer shall instruct all workers who come into contact with animals about any transmittable diseases the animals may carry and how to prevent transmission to themselves.
2. The employer should encourage workers to have up-to-date tetanus shots.

Chemical Agents

1. If pesticides are used on a farming operation, the employer shall inform, instruct and supervise workers who may be exposed and advise them of the appropriate precautions to be taken.
2. Workers should be kept away from areas where pesticide drift may occur.
3. Where pesticides or other chemical agents are used to treat crops or other farm products, label instructions should be followed, including the observance and posting of re-entry times for workers. Additional information about the safe handling and application of pesticides is available through the Ontario Pesticide Education Program administered by the University of Guelph (visit the web site at www.ridgetownc.uoguelph.ca/OPEP).

Physical Agents

1. The employer shall inform workers about the dangers of hazardous noise exposure and instruct and supervise workers on the proper use and maintenance of hearing protection when it is required.
2. The employer should identify areas where workers may be exposed to noise levels over 85 decibels for sustained periods.
3. The employer should reduce noise levels where possible by using sound barriers, ensuring equipment is maintained or, by other engineering means.
4. Where noise levels cannot be reduced below 85 decibels, appropriate hearing protection should be provided to the workers who are exposed.
5. Radiation from the sun can lead to skin cancer. Heat from the sun may also lead to heat stroke and heat exhaustion. The employer should inform workers about the hazards and instruct them on how to protect themselves.
6. Vibration transferred from hand-operated tools and equipment (for example, a chain saw) can lead to white finger disease. The employer should inform workers about the hazards associated with exposure to vibration and inform workers on how to protect themselves.

Ergonomic Hazards (work design)

Ergonomic injuries generally arise from poor body posture or position while working, as well as from repetitive motion.

1. The employer should carry out an ergonomic assessment of job tasks and work stations and consider designing the work and work stations in a way that prevents musculoskeletal injuries from occurring.
2. The employer shall provide information and instruction to workers on proper lifting and carrying techniques.
3. The employer should develop a procedure for lifting items that are too heavy for one person to handle.
4. The employer should give appropriate rest breaks to workers working long periods or with heavy workloads.

