AgriSafetyNet

Agricultural Safety Through Lifelong Learning

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Module 3

SPECIFIC HAZARDS & PREVENTION IN THE AGRICULTURAL SECTOR

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MODULE 3 – Specific hazards & prevention in the agricultural sector

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Introduction

Agriculture is and remains a sector in which accidents at work are disproportionately common. In addition to the general risks on farms described in Module 2, there are specific agricultural risks and related more particular accidents. However, many of these accidents can be avoided or at least their severity can be reduced. For this purpose, consolidated specialist knowledge and protective measures that are tailored to the respective tasks are important. In addition to preventive measures, innovative technical training is also important. Learn about controls and solutions related to these specific hazards.

In this Module we will focus on a number of particular accidents in farming: specific hazards and its prevention.

Figure 1:

Source: https://www.wgcsa.com.au/uploads/5/9/7/5/59756067/00-farmers-guidebook.pdf

Gears

Crushed hands and arms, severed fingers, blindness - the list of possible machine-related injuries is as long as it is frightening. There seem to be as many dangers from moving machine parts as there are machine types. Safety precautions are essential to protect workers from unnecessary and avoidable injuries.

A good rule to remember is that every machine part, function or process, many of which cause injury, must be protected. If the operation of a machine or inadvertent contact with it can injure the operator or other persons in the vicinity, the hazards must either be controlled or eliminated.

Figure 2:

Source:

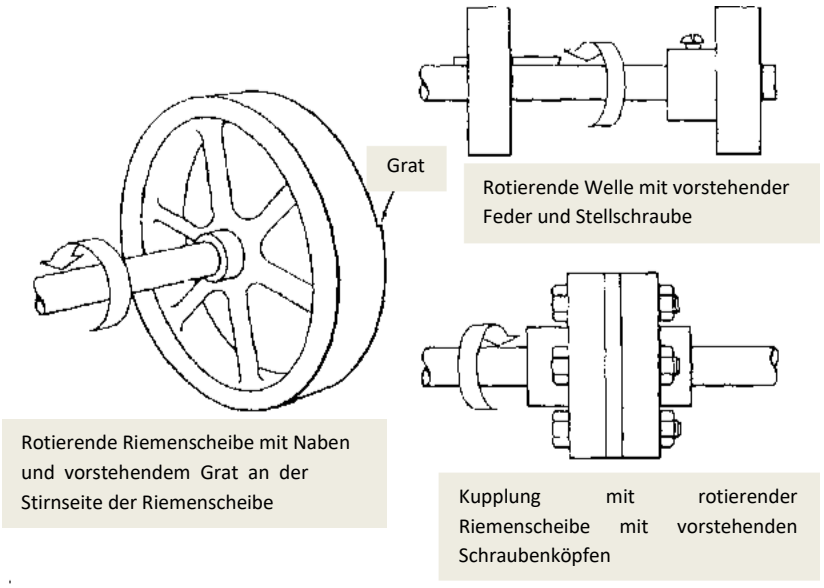
https://t3.ftcdn.net/jpg/01/34/00/78/240_F_134007875_Ts7bc3Kg604RnqkZaRayI4rmgV3zqTk9.jpg

Rotating Elements

Rotating motion can be dangerous; even smooth, slowly rotating shafts can grip clothing, and through mere skin contact force an arm or hand into a dangerous position. Injuries due to contact with rotating parts can be severe.

Collars, couplings, cams, clutches, flywheels, shaft ends, spindles, meshing gears, and horizontal or vertical shafting are some examples of common rotating mechanisms which may be hazardous. The danger increases when projections such as set screws, bolts, nicks, abrasions, and projecting keys or set screws are exposed on rotating parts. View figure 3.

Figure 3



Source: https://www.osha.gov/Publications/Mach_SafeGuard/gif/mach01.gif

Dangers in the roller gap are caused by the rotating parts of machines. There are three main types of incoming nips.

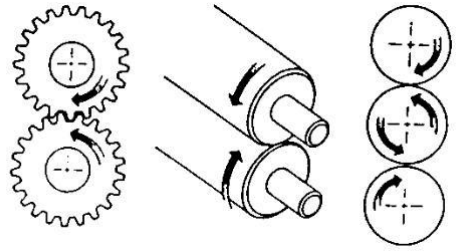
Parts can rotate in opposite directions while their axes are parallel to each other. These parts may be in contact (creating a nip) or in close proximity to each other. In the latter case, the material fed between the rolls creates the nip points. This danger often exists in machines with intermeshing gears, rolling mills and calenders. View figure 4.

Nip points are also created between rotating and tangentially moving parts. Some examples would be: the point of contact between a driving belt and its pulley, a chain and sprocket, and a rack and pinion. View figure 5.

Nip points can occur between rotating and stationary parts, which produce a shearing, squeezing or grinding effect. Examples of this are: Spoked handwheels or flywheels, worm

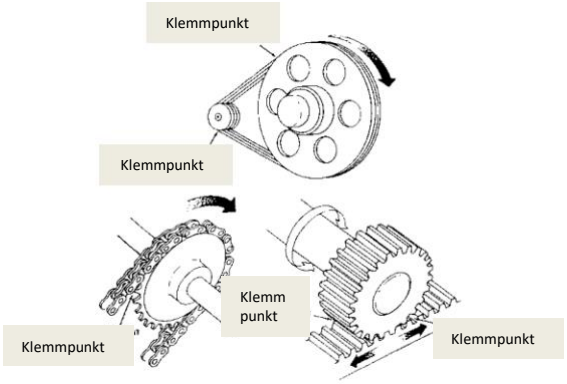
conveyors or the circumference of a grinding wheel and an incorrectly adjusted work support. View figure 6.

Figure 4



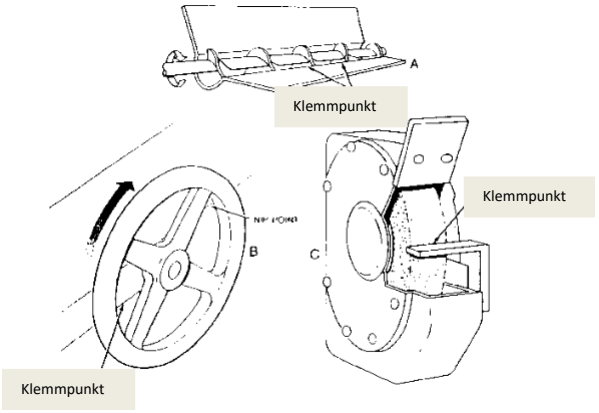
Source: https://www.osha.gov/Publications/Mach_SafeGuard/gif/mach02.gif

Figure 5



Source: https://www.osha.gov/Publications/Mach_SafeGuard/gif/mach03.gif

Figure 6



Source: https://www.osha.gov/Publications/Mach_SafeGuard/gif/mach04.gif

How can employees be protected and secured against such dangers? The safety precautions must comply with the general minimum requirements:

• Prevent contact:

prevent the hands, arms and other parts of the body of a worker from coming into contact with dangerous moving parts

• Secure:

Guards and safety devices should be made of durable material that can withstand the conditions of normal use. They must be firmly attached to the machine.

• Protection against falling objects:

The safety device should ensure that no objects can fall into moving parts.

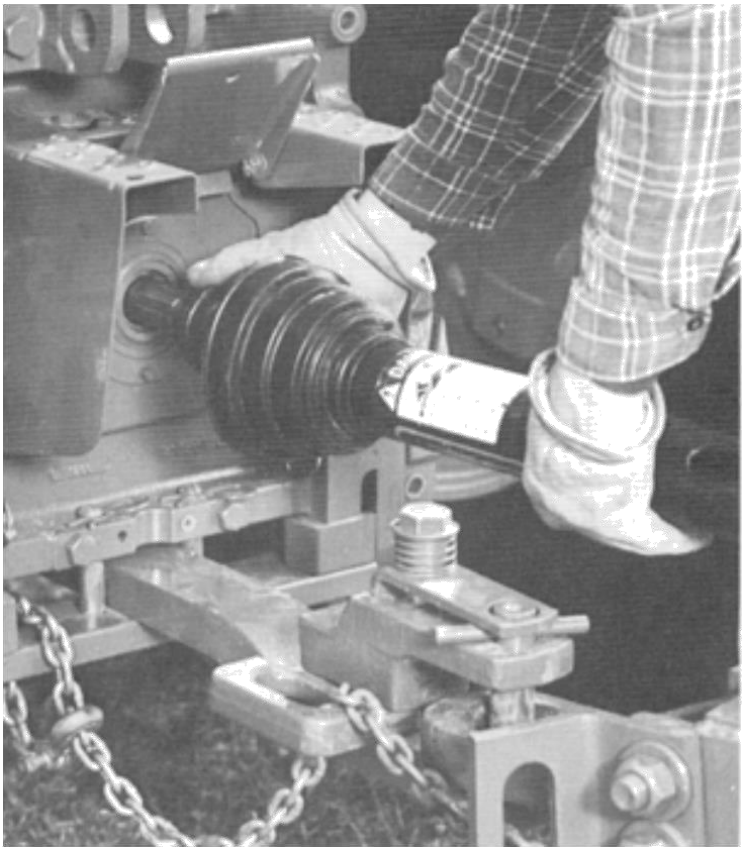
• Do not generate any interference:

Proper safeguarding can actually increase efficiency by dispelling the worker's fear of injury.

Preventive Routines for the power-take-off (PTO), Cardan Shaft & Implements

The power take-off shaft (PTO) of the tractor is a great danger. It transmits power from the tractor to PTO-driven machines. The PTO shaft normally turns between 540 and 1,000 revolutions per minute. This is much faster than a human being can react if he is caught and pulled in or around the PTO shaft. A person can have an arm or leg wrapped around a PTO stub before they know they are in danger. A PTO main shield protects a person from the PTO stub. Some tractors have a PTO guard. All tractors should be equipped with a main PTO shield to protect the tractor operator and helpers.

Figure 5



Source: https://ag-safety.extension.org/wp-content/uploads/2019/05/English-Task-Sheets-Group-5.pdf

Figure 6

Source: https://nasdonline.org/static_content/documents/1658/020a-002.gif

Tractor hazards

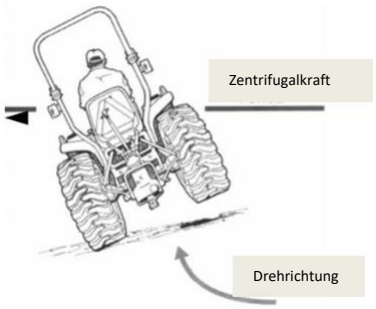
Tractors are a major cause of work-related injuries on farms, but not all injuries occur while the tractor is being used for work.

Here we focus on

1. overturns

2. runovers/

entrapments Figure 7



Source: https://ag-safety.extension.org/wp-content/uploads/2019/05/English-Task-Sheets-Group-5.pdf

Figure 8

Source: https://ag-safety.extension.org/wp-content/uploads/2019/05/English-Task-Sheets-Group-5.pdf

1. overturns

There are dozens of examples of tractor handling. Most are avoidable if operators follow good and safe tractor operating practices. Some common examples of tractor overturning are

- Turning or driving too close to the edge of an embankment or ditch

- Driving too fast on uneven roads and lanes and running or bouncing off the road or lane

- Coupling at a point other than the drawbar when pulling or towing objects

- Drive tractor straight on a slope that is too steep

- Sharp turning of a tractor with raised front loader

Prevention:

A roll-over protection structure (ROPS), a steel cage surrounding the driver - in particular a cage built into an enclosed cab - can protect the driver from being killed if a tractor overturns. This is particularly true if the driver has his seat belt on. Remember, however, that a ROPS can protect you from injury, but cannot prevent the tractor from falling over from the outset. This explains how important it is to operate a tractor safely, even if the tractor has a ROPS.

2. runovers/ entrapments

There are three basic types of tractor rollover incidents.

One is when a passenger (additional driver) falls down on the tractor. Incidents with an additional driver occur because there is only one safe place for one person on the tractor, and that is in the driver's seat.

Another is when the tractor driver falls from the tractor during operation or is thrown out of the seat by a low-hanging branch or other obstacle.

In the third type of run-over accident, a person is on the ground near a tractor. This may include the tractor driver trying to start a tractor from the ground while the tractor is in motion.

Prevention:

Additional drivers may slip and be crushed by the tractor before the driver can stop. Say no to your friends who want to hitch a ride.

For any reason, turn off the tractor before getting off.

Rototiller hazards

Many of rototiller injuries are lacerations to lower legs and hands followed by hand burns, back strains, and contusions to hands, knees, and wrists. The following precautions should be kept in mind using walk-behind rototillers.

Operating Precautions

- wear safety glasses
- wear hearing protection
- wear long pants and sturdy shoes
- do not operate a rototiller inside an enclosed space
- Prior to starting, inspect the area to be tilled for large rocks or foreign objects
- Do not till above underground utility lines.
- Shift rototiller into neutral and disengage clutch before starting.
- Always operate a rototiller in conditions of good visibility and adequate light.
- Keep hands and feet away from rotating equipment.
- Do not overload rototiller engine capacity by tilling too deep or fast.
- Never fuel the rototiller when the engine/muffler is hot.
- Shut off the rototiller engine and disconnect the spark plug wire before performing mechanical adjustments, maintenance, or repairs.
- Always shut off a rototiller before leaving it unattended.

Chainsaw hazards

Chain saws can be dangerous if they are not operated correctly or if the appropriate safety measures are not taken. Protect your workers before they are put at risk.

Operating Precautions

• Only use chain saws that you have been trained to use correctly and safely.

• Read the user's manual carefully.

• Make sure you understand the instructions before attempting to use a chainsaw.

• Read the applicable health and safety regulations before operating a chainsaw.

• Operate, adjust, and maintain the saws according to the manufacturer's instructions and the safety requirements and recommendations for safe chain saw use described in the guidelines.

• Operate the chain saw only in well ventilated areas.

• Wear personal protective equipment and clothing.

• Ask questions if you have any doubts about the safe execution of the work.

• Do not operate the saw unless you are well rested. Tiredness causes carelessness. Be careful before breaks and end of shift.

• Have all necessary supplies and equipment ready before starting work.

• Be aware of your surroundings - weather conditions, terrain, wildlife, buildings, power lines, vehicles and other people.

Seeder hazards

Seeders and drilling machines have some special safety precautions.

Following safety procedures during drilling operations will help eliminate accidents, loss of time, and materials.

PRE-OPERATIONAL SAFETY CHECKS

• Locate and ensure you are familiar with all machine operations and controls.

• Operate only with roll over protection structure (ROPS) and seatbelt equipped tractors.

• Ensure all guards are fitted, secure and functional. Do not operate if guards are missing or faulty.

• Ensure the 3 point linkage, securing pinions and safety chains are in sound condition.

• Ensure the rotary slasher is attached according to manufacturer's specification.

• Ensure the hopper lid is locked or interlocked and the interlocking device (if fitted) is functioning.

• Check the tyre pressure on the drill seeder and tractor.

• Ensure the PTO and driveline guard are functioning.

• Ensure the hydraulic rams, hoses and couplings are in sound condition.

OPERATIONAL SAFETY CHECKS

• Keep clear of moving machine parts.

• Ensure the seed metering mechanism is functioning and in sound condition.

• Ensure the towing mechanism, securing pinions and safety chains are in sound condition.

• Ensure the coulters are in sound condition.

• Ensure the power source to the hopper is disengaged before opening the lid.

• Ensure the hopper lid is locked after topping up with seed.

• Ensure no person or animal is endangered when operating equipment.

ENDING OPERATIONS AND CLEANING UP

• Remove any foreign material from in and around coulters, spacers and hydraulic rams.

• Keep the work area and implement shed in a safe, clean and tidy condition.

Trailer and Tank hazards

In trailer towing, as in most driving situations, exposure to certain hazards occurs. Trailer towing is safe when precautions are taken. The following safety information is only a summary of the more complete information found in the Safety Standards listed at the end of these precautions. Read and follow all Safety Standards. In addition, the end user must check and comply with all federal, state, and local laws before use.

1. Use a towing vehicle prepared and capable of handling the load.

2. Towing any trailer requires special awareness because of the changed driving situation.

3. When towing, it takes longer to start, stop, and pass − use training and practice to avoid accidents.

4. Turning and backing up present new problems − plan ahead. 5. Require each driver to be fully trained and experienced in trailer

towing before going out on the road.

6. Holes are provided for mounting weld/power generator.

7. Be sure trailer is fully prepared and connected to towing vehicle. 8. Observe maximum speed of 45 mph (72 kph) when towing.

9. Do not modify or change the trailer in any way − changes void the

warranty. Read Owner's Manual.

10. Use only genuine factory parts as replacements.

11. Adjust load on trailer so tongue weight is approximately 10% of

the gross trailer weight and center load side-to-side to reduce

fishtailing.

12. Tighten all parts, bolts, nuts, and mounting hardware.

OVERLOADING can cause serious injury or equipment damage.

1. Do not overload the trailer.

2. The Gross Vehicle Weight Rating (GVWR) is the maximum total

trailer weight with the engine driven welding generator and all equipment, such as tools, cables, and shielding gas cylinder, installed.

3. The Gross Axle Weight Rating (GAWR) is the maximum load-bearing capacity of the axle(s).

4. Weigh trailer − adjust weight by removing accessory equipment if necessary − call local authorities for nearest scale location.

5. Use gross trailer weight to select a proper towing vehicle.

UNCONTROLLED TILTING OF TRAILER can result in personal injury or equipment damage.

1. Install generator according to Owner's Manual with engine end toward hitch end of trailer.

2. Distribute weight so that trailer tongue weight is approximately 10% of the gross trailer weight.

INCORRECT TONGUE WEIGHT can cause fishtailing and loss of control of towing vehicle resulting in serious injury and equipment damage.

3. Tongue weight is the amount of trailer weight that rests on the towing vehicle hitch − that is, the downward pressure on the coupler.

4. Remove or adjust trailer load to get correct tongue weight.

5. Do not let tongue weight exceed coupler and hitch rating.

6. Use slower speeds when towing a trailer to prevent fishtailing.

Harvester hazards

Typical hazards associated with the use of combine harvesters (combines) can be found in contact with the machine's moving parts including:

- being pulled into the cutting mechanism;
- contacting the knife, reel or stripper rotor;
- being injured by the drive mechanisms or

trapped when automatic sensors operate;

- becoming entangled with the levelling or

discharge augers in the grain tank;

- contacting the straw chopper or

spreader mechanism at the rear.

Other risks created by work with harvesters include:

- contacting overhead electricity power lines;
- being run over;
- being trapped under the header or injured by

the header falling from its transport trailer;

- falling from the combine, especially during pre/

post-season cleaning, maintenance or refueling;

- noise;
- grain dust.

To minimize risks to the operator and others during work with harvesters it is necessary's to follow some basic rules and procedures.

The most important safety measure is to follow the 'safe stop' procedure before carrying out any maintenance or adjustments, including dealing with a blockage or other problem:

■ Handbrake on

■ Controls neutral

■ Stop engine

■ Remove key

Many serious and fatal accidents have occurred where operators have tried to clear blockages or worked on the machine with the engine running or power engaged. So always make sure you follow the safe stop procedure.

For safe operation of the machine:

■ Check all guards are in position and correctly tted before starting work. Do not run the combine with the guards raised or removed.

■ Make sure you, your employees, relief drivers, seasonal workers or contractors are properly trained in how to use the combine safely. Make use of relevant training courses such as those provided by manufacturers/suppliers.

■ Never carry passengers on the combine unless seated in a proprietary passenger seat and do not mount or dismount the combine when it is moving.

■ Children under 13 years of age must not drive or ride on combines.

■ Make sure you keep reversing mirrors clean and properly adjusted.

■ Combines are bulky vehicles and operator vision to the rear may be poor so be particularly careful when reversing. Sounding the horn before starting the engine or reversing can help alert others.

■ Remember the hazards posed by straw choppers and spreaders – allow adequate rundown time before approaching the rear of the combine.

■ Ensure any pedestrians are clear before moving off.

■ When unloading the combine on the move you

will need to plan and coordinate your movements carefully to match the tractor/trailer combinations working with you.

■ Keep the cab door shut to keep out dust and noise.

■ Make sure operators are aware of the risks and the safe operating procedures and are provided with the operator's manual.

■ Use any grain sampling mechanism provided.

■ Take care on slopes and avoid sudden changes of direction. Park on at ground where you can. If you must park on a slope, park across it. Brake and turn with care on downhill and side slopes.

To work safely:

■ Provide operators with instructions and training, including information on the location and heights of OHPLs (farm maps will help).

■ Provide operators with information about the risks and the action to take in the event of contact with an OHPL, including emergency contact numbers.

■ Use safe operating procedures in the vicinity of OHPLs, eg when unloading.

■ Never park the combine, carry out maintenance, or extend the discharge auger when under or near OHPLs.

■ If you are using a contractor to carry out the work you should discuss and agree the system of work to be followed before they begin working, and provide information about the location of OHPLs on your land.

■ Display suitable warning signs as in a prominent position within the cab.

Figure 9:

Source: https://www.deere.com/assets/images/region-1/products/harvesting/asia/cotton-harvester/7660-1366x766.jpg

Figure 10:

Source: http://www.pikrite.com/wp-content/uploads/2012/12/Bell-Pepper-Harvester-5-e1377875267594.jpg

Figure 11:

Source: https://images.wisegeek.com/combineharvester.jpg

Grape harvester hazards

A mechanical grape harvester travels along rows of vineyards and uses rubber or fiberglass rods to shake fruit off the vines. Mechanical harvesters expedite the process, but the heavy, fast moving equipment, with its many conveyors and fans, make this an operation that requires special attention to safety.

Figure 12:

Source: https://assets.cnhindustrial.com/nhag/nar/assets/Grape/braud-compact-series-grape-harvester/Gallery/braud-compact-series-grape-harvesters-gallery-02.jpg

Obtaining training in harvester operations and reading the operator's manual for precautions and special instructions before operating this vehicle are critical. Make sure that you understand all of the components of the harvesting system, including the harvester, the dump cart, and final discharge to valley bins for transport and processing. Also, due to the seasonal nature of harvest work, train at least annually on harvester operations.

There are ride-on and tow-behind harvesters, and both have many moving parts that can cause serious injuries:

- Rods and beaters shake the vines to release the berries.
- Grape conveyors move the freshly picked berries inside the machine.
- Cross conveyors discharge berries outside the harvester to nearby dumpcarts.

• Onboard or boom-mounted deleafers and destemmers remove material other than grapes (MOG).

• Cleaning fans can also be used to chop, vacuum, and blow MOG off of the berries.

All moving equipment parts should be guarded where possible and always keep your hands, feet, and other body parts away from all moving parts. When you are near moving equipment, you should wear form-fitting clothing, remove dangling jewelry, and keep hair tied back.

Consider personal protective equipment such as sturdy boots, long sleeves and pants, and a visibility vest. Wear gloves to protect your hands when needed, but not around moving parts and equipment.

Before harvest work begins, survey the vineyard area for hazardous conditions such as electrical lines, utilities, water sources, and uneven or unstable ground. Choose a harvester suitable for the trellis/canopy system in the vineyard. Mechanical harvesters can be top heavy and prone to tipping, so only use them on stable ground at a suitable slope. Always watch for ditches and embankments and dump grapes only on level ground as the rising bucket can make the cart unstable.

Keep in mind that harvesters cannot back up, so choose the vine row carefully before you operate the harvester.

Make sure the harvester you operate is properly maintained:

• Don’t operate a machine that needs repair.

• Don’t try to clear clogs or jams yourself.

• Keep guards and shields on moving parts at all times.

• Shut off the engine and wait for all moving parts to stop completely before removing guards and shields.

• Use proper lockout/blockout when working on the machine for maintenance or repair.

• Always wear your seatbelt when operating the harvester and never leave a running harvester unattended—shut it off, apply the parking brake, and remove the keys when you need to park or leave the machine.

Be aware of other harvest workers on the ground and operating equipment in the area. Good communication with coworkers about your movements is important, so sound the horn

before you start and/or move the harvester. Use backup alarms if the harvester is equipped. While operating at dusk, night, or dawn, keep all of the harvester lights on. You should never allow the harvester or conveyors to travel over workers and do not give rides or permit workers to climb on the machine.

Mechanical harvesters bring in grapes quickly, and, economically. Excellent training, safe work practices, and communication make the process go smoothly.

Farm Equipment Safety Tips

These tips should be kept in mind always to avoid accidents when operating equipment and machinery on your farm:

1. **Read and comply with the manual.** Always thoroughly read the manual for each piece of equipment. Your new tractor may function differently than your old one, for example. Then, comply with the instructions and rules

2. **Follow and keep up with federal and state laws.** These laws are in place to protect both you and the citizens around you, and it's best to make sure you're keeping up with changes to avoid fines.

3. **Always keep your slow-moving-emblem (SMV) clean, visible and properly mounted**. This is an important law. Following it can prevent rear-end collisions while transporting and potentially save a life. Road safety is so important.

4. **Dress appropriately.** An untied shoelace, flowing long hair and stray threads from an old shirt have, in the past, led to horrendous injuries when operating farm equipment. Dressing appropriately can mean reducing risk of such injuries.

5. **Ensure you're well rested.** Feeling fatigued when operating machinery can be dangerous. Make sure you're taking breaks from work when you need rest.

6. **Avoid alcohol.** Even one drink can affect your ability to operate machinery. Keep alcohol out of the picture until you're done for the day.

7. **Maintain awareness**. Stay focused. Be aware of what you are doing and where you are going.

8. **Adjust equipment accordingly.** This means keeping all guards, shields and access doors in place when operating equipment, and making necessary alterations to equipment to fit operational conditions.

9. **Keep children and animals away from working areas.** Farms offer a world of adventure for curious kids. To avoid any disastrous accidents, keep your child's play area separate from your work area. Know where your children are even when you are mowing the lawn. Don't let a split-second accident impact your child forever.

10. **Read up about planter equipment safety.** Although operators should bear in mind similar safety precautions when using planter equipment, it's good to read up about the specifics.

(Source: https://www.ruralmutual.com/resource/farm-safety/farm-machinery/10-safety-tips-remember-farm-equipment-uses/)

Pesticides & fertilizers

Chemicals pose a risk by different routes including inhalation, ingestion and absorption. The risk posed by the chemical depends on its chemical properties, particularly toxicity. The ill health effect caused ranges from irritation, allergy, poisoning or even death. Chemicals are at their most dangerous when in concentrated form. Those who are at risk are those who use the chemicals and those who may be exposed to the chemicals while they are on the farm.

- Locked storage: Lock away all chemicals
- Proper PPE
- Trained Persons
- Equipment in working order : Maintain machinery It

is very important to know the symbols:

 ; E; Explosive

 ; T; Toxic

 ; Xi; Irritant

 ; F+; Extremely flammable

 ; Xn; Harmful

 ; F; Highly flammable

 ; C; Corrosive

 ; O; Oxidizing

 ; T+; Very Toxic

 ; N; Dangerous for the environment

The effects of chemical exposure depend on the type of chemical and the degree of exposure. If chemicals are swallowed, absorbed through the skin or inhaled as a mist, vapour or dust, some of the immediate effects can include:

- poisoning
- headache
- nausea
- vomiting
- diarrhoea
- pinpoint pupils
- dizziness
- fine muscle twitching
- increased bronchial and lacrimal secretions
- skin rashes and irritation
- chemical burns.

The risk of using pesticides and fertilizers is greatest when the directions are not followed exactly.

General:

• Always wear appropriate protective clothing. Never wash contaminated clothing with other clothing.

• Take precautions to prevent spills. For example, close containers tightly after each use, even if you plan to re-open them soon.

• Know what to do if a spill occurs.

• Mix only the amount needed for the job.

• Follow the directions on the label exactly.

Application:

• Avoid spraying over impervious surfaces.

• Do not spray on a windy day.

• Do not apply to bare of eroding soil.

• Do not apply near water systems such as wells, streams, and lakes.

Storage:

Be extremely careful with the storage of chemicals to prevent leaks, spills, and inadvertent accidents. Keep the chemicals in their original containers so you know what they are and how to use them. Mark the date of purchase on each container and use older materials first. If possible, store pesticides and herbicides indoors in a clearly marked area designed as secondary containment.

Cleaning and Disposal:

The best methods for cleaning containers and equipment are to triple rinse or pressure rinse in the field. To triple rinse: allow the concentrate to drain from the empty pesticide container for 30 seconds. Fill one-quarter of the container, replace the lid, and shake the container so that all interior surfaces are rinsed. Drain the rinse water into the spray tank for at least 30 seconds. Repeat the process twice for a total of three rinses.

Rinse water must be collected and applied to a compatible site at or below the labeled rate. Empty pesticide and herbicide containers cannot be refilled, reconditioned, recycled, or sent back to the manufacturer. They must be crushed, broken, or punctured so that they cannot be used again.

In general, small containers that are used in the home can be disposed of in the trash pickup after they have been rendered unusable and then wrapped in plastic.

Leftover pesticides and herbicides used in residential settings may be disposed according the law.

Fertiliser storage

Correct storage of fertiliser is important to ensure safety. Where possible, fertilisers should be stored in a closed, secure storage place to protect the product from the weather and reduce the risk of theft.

Fertiliser spreading advice

To achieve the best results when using fertilisers, the nutrients have to be spread accurately and evenly and at the right rate across the whole spreader width. A high quality fertiliser is important, but so is how you spread it!

Fertiliser handling and transport

It is important to handle and transport fertiliser safely whilst minimising deterioration in quality. Correct handling and transportation of fertiliser should be based on climatic conditions, the type of fertiliser and how it is shipped (bulk or bags).

Workspace and livestock facilities

If you're engaged in livestock, you've got a lot to think about. Supplying the animals is the basis, but everything from tools and machinery to safety measures and routine maintenance plays a major role in your daily operations. The problem is that in a functioning farm, one small incident can trigger a series of problems that put your entire farm at risk before you know it. You should know your risks and know how to avoid them.

In this Module we focus on:

- Fire (more information on this topic as well in Module 2)
- Equipment Failure
- Building damage and collapse

Fire

Farms are by nature quite easily flammable: Hay, straw, dust and barn boards can become a big pile of kindling under the right conditions. If you run a farm with livestock, these flammable materials can quickly accumulate in the form of feed, litter and other related waste, and it only takes a small trigger to set a barn on fire.

Every time a heat source is placed on a haystack on the floor or in a dusty barn there is a risk of fire. Similarly, irregular maintenance or an unorganised workspace can cause problems: Debris can accumulate in wood-burning appliances, and electrical appliances used in damp areas can easily become electrical hazards. Have you recently checked your fuel tanks? Any tanks that are in poor condition or have been improperly stored could be a major incident waiting to happen.

Equipment failure

Faulty equipment and power failures are the cause of many major losses on farms. Dairy farms rely on milk storage tanks to store and preserve their product, so a power outage could result in a significant amount of spoiled milk. In fact, spoilage is a major concern for both dairy and poultry farms, especially in hot summer weather.

Although poultry houses are generally equipped with a minimum of machinery, the ventilation system is a critical component of a healthy farm. Overheating is a serious threat, especially in a broiler house during the warmer months: If the mechanical ventilation system does not allow air to pass through the barn, the barn can heat up quickly and your entire flock could suffer from heat stress. In the worst case, all the livestock could be lost.

Building damage or collapse

Barns are built to last, but poor maintenance and general wear and tear could jeopardise the structure. Roofing is a common weakness, especially when the roof gusset plates start to deteriorate. Without regular inspection and maintenance, corrosive materials (ammonia is a by-product of poultry farming) can form, which weaken the sheets. At this point, even a

moderate snowfall could be so heavy that the panels give way and the roof collapses onto the animals and equipment inside.

A collapsed roof is only one possible scenario. Your farm buildings could also be damaged by burst pipes - these too are prone to damage, and freezing temperatures can affect their integrity. The risk can be particularly high for dairy farms that use pipes for both water and milk. And even if your water damage is not irreparable, interrupting your business can cost you significant time and money.

Slurry and manure

Ventilation, signage, fencing and even atmospheric testing are worthwhile precautions against the dangers of manure.

Manure poses two particular health and safety problems - drowning and gas poisoning. Drowning is by far the most common cause of death from manure. Children and the elderly are particularly at risk.

It is important that the farmer and farm workers are advised on the precautions necessary to prevent these incidents, including practical advice:

• to avoid exposure to manure gases;

• standards for fencing etc. necessary to prevent unauthorised persons - especially children - from accessing areas used for the storage of manure, other effluents or water on farms;

• the prevention of vehicles entering areas used for the storage of liquid manure;

• assessing the integrity of above-ground manure storage areas.

Hazards and diseases associated with livestock management

There is a high risk of injury or health problems when handling animals on the farm. Working with livestock is dangerous and even the most experienced farmers can be injured.

The right approach can help ensure safety for you and your farm workers.

The most common physical hazards faced by livestock handlers include:

- kicks
- bruises
- slips
- falls
- abrasions
- punctures.

These hazards can be controlled by good maintenance of the equipment, training and the use of personal protective equipment. It is important to use safety shoes with suitable soles, leather gloves and clothing that is not too loose and can easily get caught.

Health risks to livestock farmers include:

- zoonoses (infectious diseases transmitted from animals to humans),
- allergies due to complex organic dust, noise and exposure to chemicals/medicines.

Common zoonotic diseases such as rabies, tetanus, anthrax, brucellosis and bovine tuberculosis are all controllable.

Proper animal handling, good personal hygiene and prompt veterinary and medical care will minimise adverse effects.

Adequate respiratory protection is essential to reduce the inhalation of organic dust particles such as animal hair, moulds, spores and plant particles.

Once these types of particles enter the respiratory system, there is a possibility that the body may become allergic or irritated to the particles and subsequent exposures may be more severe.

Exposure to veterinary medicinal products and animal blood and body fluids may have an impact on the health of livestock owners.

Follow the instructions for administration carefully and avoid needlesticks or direct personal contact with the medication or body fluids of animals.

To reduce the risk of injury when handling livestock for you and your staff, as well as visitors such as veterinarians, here are eight tips for working with livestock:

• Only use a yard and facility that is designed for the stock to be moved.

• Avoid working alone, and if you are working alone, let your colleagues know where you are, when you are coming back and have a mobile phone or radio with you.

• Check the pen for risks and make sure that the locks and latches are in order.

• Make sure that you have free escape routes.

• Do not overcrowd the yard - keep it about 2/3 full so that you have freedom of movement.

• Keep the animals as quiet as possible.

• Train all workers who use the farm.

• Make sure that the facilities are in good condition so that the livestock transport workers can load and unload efficiently.

Prevention routines

Prevention routines in livestock management can be done concerning the facility, the farmer, the animal.

Facilities

Poor facilities and equipment can cause injuries to animals and people. Extensive planning should be carried out before building or renovating livestock facilities. The characteristics of the animals, together with possible expansion, should be considered when planning a facility.

1. Alley and loading chutes

Wide enough for the free passage of the animal, but not wide enough for the animal to turn inside.

Walkways on the outside of the alley or slide so that you do not have to go into the alley or hang over the edge.

Solid walls on slides and curves in the alley to reduce the risk of scaring the animal from the outside.

Floors should be designed to prevent slipping and yet be easy to keep clean.

2. fences and gates

Strong enough to withstand the throng of animals.

Free from any sharp projections like nails or wire.

3. floors

concrete or other impermeable materials.

slip resistance (grooved in passages).

4. lighting

Uniform, diffuse lighting.

Avoid animals looking directly into the sun.

Animals move more easily from dark to light areas.

The lighting can affect the productivity of some animals.

5. restrained

The handler should have free access to all parts of the animal without having to reach over or through the parachute.

All restraint devices should be checked regularly for wear or damage.

Farmer

Handling methods vary greatly from species to species, but there are some generally accepted rules for all animals:

- Respect the animals; do not fear them.
- Be calm and cautious; most animals respond to routine.
- Avoid fast movements or loud noises; announce your presence in good time before you approach an animal so as not to frighten it.
- Be patient; never push an animal when it has nowhere to go.
- Always secure an escape route when working with an animal in a confined space.

Animal

Some procedures for handling animals are the same regardless of the animal:

- Avoid rough handling.
- Do not tease or provoke.
- Avoid loud calls or noises that might frighten an animal.
- Do not enter a bay from which you do not have a quick way out.
- Mothers are protective; do not stand between them and their offspring.
- Adapt your skill in handling animals to the temperament and size of the animal

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