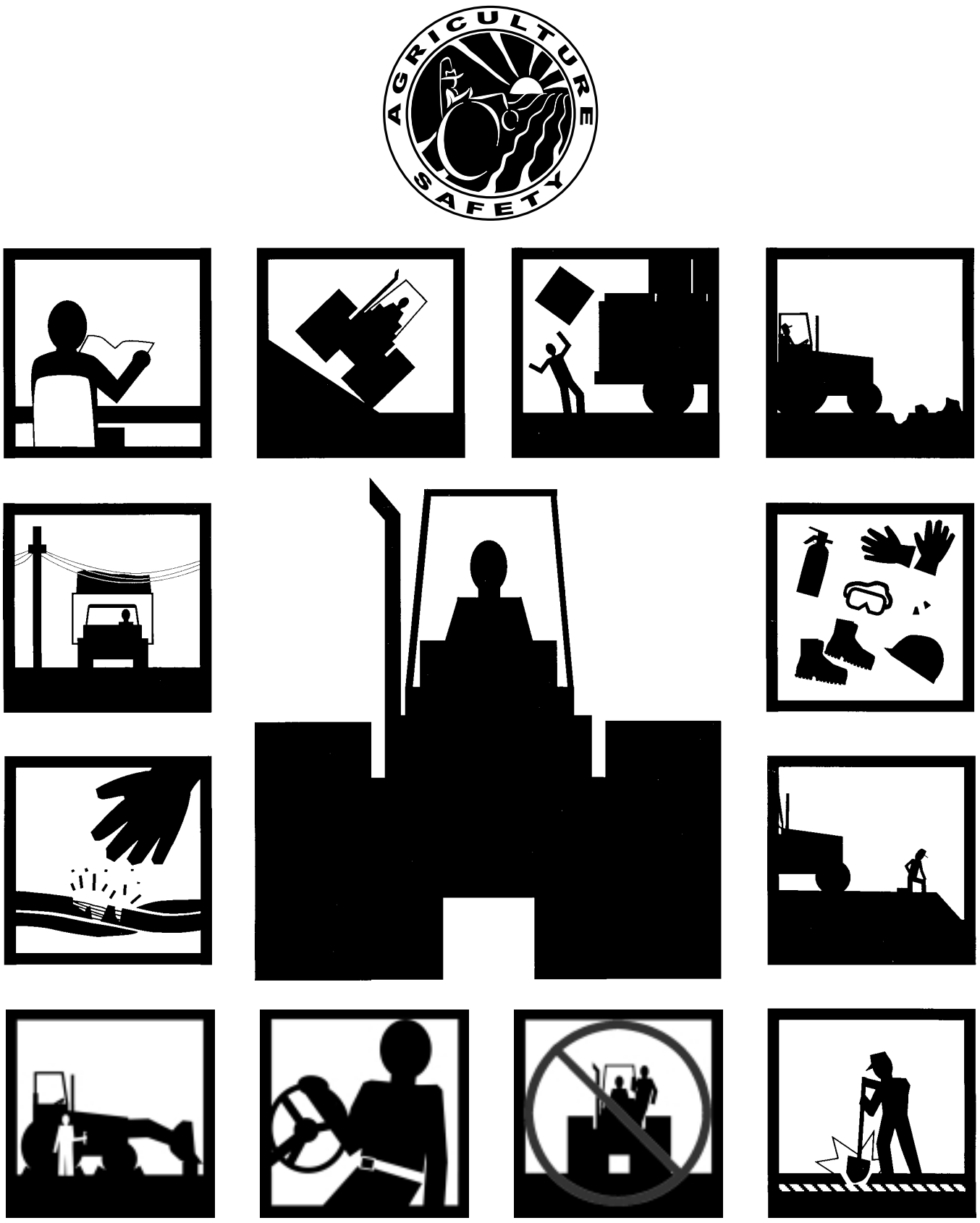


Farm Safety Series

This packet contains a set of fact sheets that will help you develop an effective safety and health program on your farm or ranch. Safety specialists at the University of Idaho, Oregon State University, and Washington State University grant permission to copy this information for on-farm worker training.

A Pacific Northwest Extension Publication

Idaho • Oregon • Washington

Farm Safety Series PNW 512 Published December 1998 $6.00

Farm Safety Series

This series of 15 fact sheets will help farm and ranch managers conduct employee training on safety and health topics. Having a regular series of training sessions with employees is an effective way to manage risks associated with the work that is done on farms and ranches. You may duplicate these masters as you provide information about taking proper safety precautions and health tips to your workers.

- (Introduction) **Developing a Safety and Health Program to Reduce Injuries and Accident Losses**
- **Tractor Operation Safety: Preventing Overturns**
- **Tractor Operation Safety: Preventing Falls and Runovers**
- **Safe Agricultural Implement Operation**
- **Highway Transport of Agricultural Equipment: Preventing Public Road Accidents**
- **Backhoe and Loader Operational Safety**
- **Safe Harvesting Operations: Preventing Accidents While Harvesting Hay and Forages**
- **Preventing Accidents While Harvesting Small Grains**
- **Truck Safety: Preventing Accidents with Trucks and Trailers**
- **Agricultural Machinery Maintenance: Preventing Shop Accidents**
- **Using Hand Signals to Prevent Accidents**
- **Electrical Safety**
- **Medical Emergencies: Farm and Ranch Emergency Response**
- **Farm and Ranch Child Safety: Give Your Children Appropriate Tasks**
- (Evaluation) **How Does Safety Rate on Your Farm Or Ranch?**

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Developing a Safety and Health Program to Reduce Injuries and Accident Losses

A sound safety and health program is an effective way to manage risks, much like an irrigation program or weed control program is to crop production. Accidents are costly. Estimated costs for agriculture-related accidents can range from $58,000 to $87,000 per disabling injury. A safety and health program can be simple and should be tailored to your specific operation. Whether you have five, 10, or 100 employees, the information that follows will help you to develop an effective farm or ranch safety and health program.

A safety and health plan needs to include at least these items as part of an accident prevention program. Make these items available to your workers in a location such as the farm shop or display on a bulletin board:

- **Safety and health policy statement.**
- **Workplace safety rules.**
- **Safety director's name and phone number.**
- **Record keeping system to report safety and health issues.**
- **Formal training on safety and health awareness for employees.**
- **Periodic inspection of work areas.**
- **Recognition of hazards.**
- **Inform workers of safety items required by law.**
- **Plan for emergency preparedness.**
- **Maps locating emergency equipment and supplies.**

Written Safety and Health Policy

A written policy statement is an effective way to communicate a commitment to farm or ranch worker safety and health. The policy statement need not be elaborate; a paragraph or two should be sufficient. This document is also looked upon favorably by insurance companies, regulators, and others should an accident occur. Your safety and health policy should include some of the elements listed below.

- **The overall goal of your policy.**
- **A statement indicating your commitment to making employee safety and health your highest priority.**
- **Inform employees to follow all safety rules and to report all injuries to their supervisor.**
- **Request that employees immediately bring all unsafe working conditions or equipment to the attention of the supervisor.**
- **Inform employees that safety will be reviewed periodically.**
- **Encourage employees to offer solutions for safety problems or concerns.**

The safety and health policy should be posted where employees will see it. Individual policies should be signed by the employee. See the sample Safety Health Policy on the next page.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Sample Safety and Health Policy

_____ (name of farm, ranch, or company) recognizes the value of the individual employee. The safety and health of our employees is our highest priority. We will make every effort to provide safe and healthful working conditions at all times. Employees are required to follow all company safety rules. Unsafe working conditions, unsafe practices, or machines that are unsafe to operate must be reported to supervisors immediately. Employees also must report to their supervisors any injuries that occur at the workplace.

_____ (name of farm, ranch, or company) intends to comply with all safety laws and regulations. Safety issues will be reviewed regularly with our employees.

_____ (name, title) is responsible for having periodic safety meetings, providing safety and health inspections, and making sure that _____ (employee's name) has a healthful and safe working environment. I have read and understand the safety policy.

Employee _____ Date_____ Safety Director/Supervisor_____ Date_____

Workplace Safety Rules

Basic and specialized safety rules need to be developed for all employees. Here are sample rules for a farm or ranch workplace. You may wish to change rules to suit the nature of your operation. Just remember that rules are less likely to be effective if the list is long. They must be simple, easy to understand, and be in a language known to the worker (e.g., Spanish, English, Thai, etc.).

Post your safety rules in highly visible locations to serve as a continuing reminder to employees.

Safety Director

Someone must be responsible for the safety program. It can be the owner, manager, or a reliable supervisor or worker. This person should help establish a budget to ensure that the program not only meets regulatory requirements, but also effectively addresses all the hazards of an operation. Employee responsibilities for safety and health should be reviewed periodically. It is a good idea to post the "responsibilities list" in an area where it can serve as a regular reminder to all workers.

Sample Safety Rules

1. Employees will follow company rules.
2. Only qualified personnel are allowed to operate machinery or equipment.
3. Handle chemicals only if properly instructed, and under the direction of a supervisor.
4. No extra riders are permitted on any motorized equipment.
5. Absolutely no "horseplay" in work areas.
6. Absolutely no use of alcohol or drugs in the work area.
7. Wear all appropriate personal protective equipment (e.g., respirator, gloves, goggles), as instructed by the supervisor.
8. All injuries and property damage accidents must be promptly reported to your supervisor.
9. Ask questions if you do not understand the task you are responsible to perform.
10. Consequences for not following safety rules must be stated. These can range from verbal warnings to suspension to work termination.

Record Keeping System

Records must be kept of all training programs and accidents that have occurred. Have employees sign log sheets indicating the training received and date it. Accidents should be investigated and causes of the accident recorded as well as all circumstances surrounding it. Keep records of hazards identified and if and when they were corrected.

Material Safety Data Sheets (MSDS) for all materials need to be kept in a central location and available to all employees. Also, make sure you have an adequate number of first aid kits and that workers know where to find them.

Training for Employees

Conduct periodic training. Even short programs are effective. Employees should be trained at least quarterly or by season. Maintain records of all training activity. Training should begin with new hires or when responsibilities change. Training may also be required when injuries or "close calls" warrant additional training for employees. It must be timely and thorough.

Use the following guidelines for designing and conducting employee training programs. These should be modified for your particular operation. Remember to tell employees what they are doing right during the training.

General Training Guidelines

1. Verify employee qualifications and experience, particularly in machinery operation. Do not just take their word for it.
2. All new employees should receive proper job instruction and safety training for their particular job responsibilities. List minimum competencies and have employees demonstrate if necessary.
3. All employees should attend a safety training session at least once a year.
4. Short (15 to 30 minutes) weekly training sessions, called "tailgate" meetings, have proven to be effective and can be used to discuss new topics and review safety concerns of the past week.
5. A safety committee can be effective when there is a large number of employees. This committee should include representatives of workers, supervisors, and management.

Training Tips

- **Explain how and why you want a job done a particular way.**
- **Personally demonstrate how to do the job properly and safely.**
- **Make certain that the employee understands the importance of their job as well as all hazards associated with it.**
- **Before leaving new workers on their own, make sure that they can perform their job properly and safely. Stay until you are certain they are doing the job correctly.**
- **Make frequent checks on new workers. Don't "hover" over them. If there are problems with employee performance, repeat the demonstration of correct work procedure. Positive reinforcement is more effective than negative criticism.**

REMEMBER...
GOOD SUPERVISION
IS THE KEY TO SAFETY.
NEVER LEAVE TRAINING
TO CHANCE!

Inspection of Work Areas

Regular inspection of work areas reduces and often eliminates potential hazards. Assign individuals—safety director or a member of a safety committee—to inspect work areas on a regular basis.

The following items need to be inspected on a daily basis:

- Equipment guards and shields
- Personal protective equipment
- Housekeeping
- Power tools, cords, and extension cords
- Ladders
- Hand tools
- Materials handling equipment

Periodic inspections need to be carried out on the following:

- Fire extinguishers
- First aid and emergency equipment
- Wiring, lighting, and electrical boxes
- Equipment storage and shop arrangement
- Pesticide storage and disposal
- Fuel storage
- Ventilation
- Emergency water supplies

Recognition of Hazards

In addition to regular inspections, employees need to be responsible for maintaining a safe, tidy workplace. Employees should be encouraged to let management know of unsafe or hazardous situations.

Safety Items Required by Law

Safety items should be posted as required by law. Posters are available on Worker Protection Standards and other laws that can be placed in a common area. Also, items such as MSDS (Material Safety Data Sheets) and records of sprayed fields need to be readily available to employees.

Emergency Preparedness and Procedures

Establish emergency procedures for use in case of injury, accident, or other emergency such as fire or severe weather. Post written directions near the phone for getting to the farm or ranch for individuals to give to emergency personnel in the event of an emergency.

Establish a Safety Committee

If your operation involves numerous employees then a safety committee should be established. The committee makeup should include workers and various levels of management. The role of the committee should be to identify potential health and safety problems and bring them to the attention of the employer.

Functions of the safety committee should include:

- Safety inspections
- Hazard control suggestions
- Accident investigation
- Review accident reports
- Safety training
- Field testing and personal protective equipment recommendations
- Safety rules and work procedures
- Safety program evaluation
- Review job procedures
- Recommend improvements

Summary

Base your safety and health program on the safety needs of your operation and your employees. Make your plan simple and practical—one that catches your employees' attention. You need to follow through with the safety plan even when things get hectic.

REMEMBER...
IF SAFETY IS NOT PRACTICED
IT WON'T BE USED.
SAFETY DOES NOT COST;
IT PAYS!

Written by Tom Karsky, University of Idaho. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Safety and Health Program Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Tractor Operation Safety: Preventing Overturns

Half of all farming and ranching accidents resulting in fatalities involve tractors. The amount of time the tractor is in use, the variety of uses, and its power and massive weight all contribute to why tractors are involved with so many accidents.

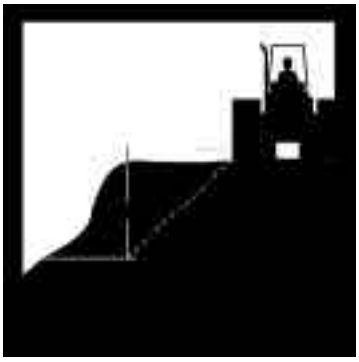
Common Tractor Accidents

Tractor overturns or "roll overs" are the most common tractor accident resulting in a serious injury or a fatality. Overturns are involved in almost half of all fatal tractor accidents. The two types of overturns are side and rear.

Causes of Side Overturns

- **Turning uphill on a steep bank.**
- **Turning a corner too rapidly. Side overturns occur even on a level surface because the centrifical force will cause the tractor's center of gravity to shift from the tractor's center to the outside wheel causing the inside wheel to lift.**

- **Operating a tractor equipped with a front end loader raised too high with a heavy load. The higher the bucket, the higher the center of gravity, making the tractor unstable especially when turning.**
- **Towing loads (implements, wagons, etc.) too heavy or loads that are unstable can cause side overturns. The whipping action of the load or failure of the tractor to control the load downhill can cause the load to push the tractor resulting in loss of control.**
- **Operating a tractor too close to a road or ditch bank. An unstable bank will give way causing the tractor to roll into the ditch.**



- **Hitting holes, logs, stumps, or bumps, particularly at high speeds.**
- **Improper loading of tractor on transport vehicles. Tractors have slipped off the bed causing serious accidents.**

Rear Overturns

Rear overturns happen very quickly (1 1/2 seconds). In a rear overturn the tractor reaches the critical point of no return in three-fourths of a second, which means you cannot prevent the overturn. Human reaction time to respond varies from one half to 1 1/2 seconds, or usually not fast enough to prevent an overturn or to escape.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Causes of Rear Overturns

- **Attempting to free a tractor that is stuck or frozen in the ground can result in a rear overturn. If the ground doesn't give, the torque forced on the rear wheels will transfer to the tractor body causing the front of the tractor to raise.**

REMEMBER: IF SAFETY IS NOT PRACTICED IT WON'T BE USED.
SAFETY DOES NOT COST; IT PAYS!

- **Improper hitching, such as hitching a chain or cable to a point above the drawbar when attempting to pull stuck vehicles or stumps.**

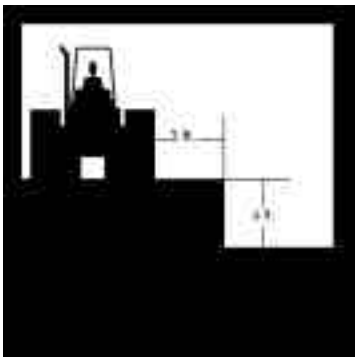
Prevention of Overturns

Following are several ways to prevent overturns and to keep the operator and others safe.

1. Tractors should be equipped with rollover protective equipment such as ROPS (Roll Over Protective Structure) and seat belts. To be completely protected always fasten seatbelts. If the tractor is not equipped with ROPS, the farm management should install one or talk to an implement dealer about installing ROPS equipment.

2. Hitch loads correctly. Always attach loads to the tractor drawbar, not to the axle or any area above the drawbar.
3. When working in an unfamiliar field or one that you have not been in for a while, stop the tractor, and walk over potential problem areas of the field. Note ruts, rocks, stumps, logs, holes and debris, etc. Moveable debris should be removed from the field before you start work. In areas of tall grass or brush, mark problem areas to warn or remind you or others of the hazard.
4. Reduce speed on rough ground, on slopes, when turning, or when driving onto roads. Operate at speeds appropriate to operating conditions.

5. Avoid sudden turns, especially on sloping ground. Avoid uphill turns, and turning too fast with a load.
6. Operate front end loaders with the bucket as low as possible. Raise only when necessary to dump the load or to clear obstacles.
7. Familiarize yourself with the tractor by reading the manual and going over the procedures thoroughly before operating. Management should train workers and family members in safe operating procedures.
8. If the tractor has ROPS and the tractor starts to roll, do ***not*** jump off of the tractor. Stay with it until the machine comes to rest.
9. When loading a tractor for transport, keep other workers out of the way until the tractor has been adequately secured to the transport. Use the right equipment for the job, such as a wide enough bed for loading and transport, proper load tie downs, and a secure ramp, not a roadbed.



10. Operate the tractor at least as far away from the edge of a ditch as the ditch is deep (e.g. 3 feet deep, then 3 feet away).
11. If the tractor is traversing a slope or traveling on the shoulder of the road with a sharp pavement incline, do not turn up slope. Always turn down slope.
12. When working on sloping land, add weight to the front and widen the wheel base of the tractor. This adds stability to the machine.
13. Do not "pop" the clutch or give a sudden jerk when pulling out stuck vehicles or stumps, or when pulling any machinery. Instead, start out slowly taking up slack in the rope or chain, and continue with a steady pull. Try to loosen the object before pulling.
14. Keep the tractor in control at all times. Don't let your tractor bounce.
15. Use the tractor only for what it was designed to be used.
16. Lock brake pedals together before driving on roadways so that you won't press a side brake and cause the tractor to suddenly swerve.
17. Get plenty of rest before operating tractors. Take periodic rest breaks when operating the tractor for long hours.

Safety Reminders

- **Slow down when turning or when working rough ground.**
- **Always hitch to the draw bar.**
- **Make sure tractors are equipped with ROPS.**
- **Keep the loader bucket low and go slow.**
- **Stay far away from the edge of a ditch.**
- **Watch out for holes, rocks, and stumps.**
- **Ease the tractor in gear when pulling. Don't "pop" the clutch.**

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Preventing Overturns Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Tractor Operation Safety: Preventing Falls and Runovers

Falling off the tractor and being runover, either by the tractor or the implement being pulled, is a common cause of fatal and serious agricultural injuries. Falls and runovers account for about a third of fatal and serious injuries involving tractors.

Causes of Falls and Runovers

- **Being thrown off the operator seat when the tractor hits a hole, stump, or ditch.**
- **Extra riders. Allowing extra riders on tractors is asking for trouble since sudden stops and starts or hitting holes, bumps, low branches, or other obstacles can cause the extra rider to fall off and be runover. Small children have even been known to fall from tractors with cabs when they accidentally bump against the door handle, thus opening the door.**
- **"Jump" starting the tractor when standing beside it. If the tractor is in gear when started it will lunge forward or backward and could run over nearby workers before they can get out of the way.**
- **Trying to mount or dismount when the tractor is moving, especially when the deck or railing is wet.**
- **Slipping on the steps or platform when mounting or dismounting. Steps or shoes with grease or mud on them or that are wet can cause operators to slip and fall.**
- **Leaving the deck of the machine cluttered with tools and other items. Loose tools can cause trips. They can also become flying objects and strike workers nearby.**

- **Riding on the tongue or any part of the implement being towed. A bump or sudden jerk can cause the rider to lose balance and fall off.**
- **The operator not aware of where others are when the machine is started and put in motion.**
- **Leaving the parking brake off when parking the tractor especially on a slope. The tractor can slip out of gear and roll forward or backward.**
- **Poor maintenance of brakes and clutches.**
- **An operator's foot slipping off the clutch when hitching implements or working on the machine.**
- **Poorly trained and physically unfit operators. They may not be able to effectively operate the controls to avoid an accident.**

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Preventing Falls and Runovers

1. Most new tractors have safety start systems that do not allow the tractor to start in gear without depressing the clutch. ***Never*** bypass these systems. When jump starting a tractor, ***always*** connect cables to the battery and not the starter. Jumping through the starter bypasses the safety start system, resulting in the operator being run over if the tractor is in gear.
2. ***Do not*** allow extra riders. The ***ONLY*** time extra riders should be allowed is for training purposes. Tractors are designed to carry only one person—the operator.
3. Slow down on rough ground or where hidden obstacles might be encountered.
4. When going into a strange field or one that you have not been in for a while, stop and shut off the tractor and walk over potential problem areas. Note hazards and debris. Mark these in areas of poor visibility, such as obstacles hidden in tall grass or brush. If you are able, remove debris before starting any tractor operations. Operators must be familiar with the area they are working!

5. Never try to mount or dismount a tractor or machine when it is moving. Keep decks uncluttered. Keep platforms clean and dry. Wear shoes that are in good condition with a slip-resistant sole.
6. Always shut off the engine and apply the parking brake before dismounting the tractor. This will prevent the tractor from moving or rolling while parked.
7. Operators should take frequent rest breaks to maintain alertness.
8. Always start the tractor from the operator's seat. When people are around, always make sure bystanders are clear of the machine before starting.

9. Train all operators thoroughly. The operators must be alert at all times and be aware of bystanders and potential hazards. They must be trained not only how to safely operate the machine, but also be familiar with the machine's mechanical capabilities and maintenance.
10. Maintain the equipment in top operating condition.
11. Install ROPS (Roll Over Protective Structure), and wear seat belts! Seat belts prevent operators from being thrown from the seat and under the tractor should an overturn occur. However, if your tractor does not have ROPS, do not wear a seat belt!

12. Never ride on the implements, especially on the tongue.

REMEMBER: IF SAFETY IS NOT PRACTICED, IT WON'T BE USED. SAFETY DOES NOT COST; IT PAYS!

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Preventing Falls and Runovers Farm Safety Series PNW 512

A Pacific Northwest Extension Publication

Idaho • Oregon • Washington

Safe Agricultural Implement Operation

Almost all agricultural operations involve implements of some kind. Safe use of these implements is of prime importance. Most injuries can be prevented simply by paying attention to the job at hand. Trouble comes from taking shortcuts because you are in a hurry or too impatient to do the job correctly. Slowing down and taking a few seconds more to do the job correctly and safely is more important and less costly than having to do the job over again or being injured in the process.

Causes of Injury from Usage of Implements

- **Failure to turn off the tractor and implement's power and to wait for the machine to stop moving completely before repairing or adjusting the machine. You risk the possibility of getting hands or clothing caught in or on the PTO or in a moving pulley, belt, or chain while attempting to work on a machine while it is running. Likewise, bystanders or others working on the machine can get entangled in it.**

- **Failing to block raised implements when working on them.**
- **Riders on the implement. Riders can be thrown from or slip off. They can be either run over by the implement or fall into it.**
- **Not paying attention when working with the machine. Operators need to react to changing conditions as the implement does its work.**
- **Exposed moving parts (pulleys, PTO's, cutter bars, shafts, belts, chains, etc.).**

Preventing Injury from Implement Usage

1. Keep all safety shields in place and in good repair. Rotating shafts cause severe injury in a matter of seconds by entangling loose or dangling clothing. Certain types of farm machinery cannot be completely guarded due to the nature of their work. Keep a safe distance from all cutting or moving parts. Mowing equipment will cut people as well as hay or weeds. Do not allow anyone to lean, push, or stand on diggers to aid in penetration.
2. Implements are not a safe place for riders. Do not allow riders on implements for any reason unless that implement is designed specifically for a person to ride and perform an operation on that implement. Riders could slip off and fall under the implement resulting in serious injury or death. Likewise, tractor riders can fall off and be run over by the implement before the operator can stop.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

3. When repairing or working on an implement, make sure it is lowered to the ground. It should be braced or blocked securely if you have to work on it in the raised position, don't depend on hydraulic cylinders to support the implement alone. When making repairs on a slope, block the wheels.
4. Always turn off power source and wait for all moving parts to stop before working on the implement. Take the key with you before working on the machine to prevent others from starting the machine while you are working on it. Select proper speeds for harvesting that will prevent clogging thus reducing the need to unclog the implement.
5. Make sure the operator knows how to operate the machine. The operator needs to know how the machine will respond in any given situation. The operator's manual is a good source of information and should be reviewed thoroughly. If the implement requires wider turns, the operator needs to slow down on turns and avoid tight places.
6. Wear proper clothing when working on implements. Loose fit clothing can get caught in rotating shafts and PTOs and cause serious injury. Make sure all moving parts are stopped and turned off before approaching. Keep a safe distance away from all moving parts.

7. Cutting equipment is very hazardous. Keep a safe distance from all cutting implements.
8. Make sure all equipment is in good working order. All pins should be in place, all bolts and screws should be tight, and all other parts should be secure and properly adjusted.
9. Know how high and wide your equipment is. Look up when moving equipment in the yard. Know where power lines are and avoid them. Be aware, also, of buildings, fences, and other obstacles when moving equipment through yards. When turning in fields slow down and allow room to clear obstacles.

10. When parking equipment, block the wheels so that the machine will not roll. Hydraulically raised equipment should be lowered and should have the transport lock engaged when parked or blocked. If this is not possible or the equipment needs to be raised, then block the equipment with jack stands or other suitable means.
11. Match the proper tractor for the implement. The tractor should be properly weighted and able to control the implement, especially when going up or down inclines.

REMEMBER: IF SAFETY IS NOT PRACTICED, IT WON'T BE USED. SAFETY DOES NOT COST; IT PAYS!

Safety Reminders

- **Turn power off the tractor or implement before making repairs.**
- **No riders on implements.**
- **Work smart by being thorough and not hurried.**
- **Block raised implements before making repairs.**
- **Be cautious around moving parts.**
- **Make sure equipment is in good working order.**

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Safe Ag Implement Operation Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Highway Transport of Agricultural Equipment: Preventing Public Road Accidents

Transporting agricultural machinery from one field to the next by way of public roads is a necessity for many in agriculture. Motorists unfamiliar with slow moving agricultural machinery can make this a dangerous situation. The potential for an accident is high. Equipment operators must be aware of the hazard their use of public roads causes and take necessary precautions.

Causes of Accidents on Public Roads

- **Difference in Speed**—Most farm machinery is transported at speeds of 25 mph or slower while other vehicles often are traveling at much faster speeds. This difference causes motorists to miscalculate how fast they are approaching farm machinery. Motorists sometimes do not even see farm equipment because they are traveling too fast.
- **Farm Size and Location**—As today's farms and ranches increase in size, land farmed is often separated by long distances, necessitating the need to transport of farm machinery on public roads.

- **Size of the Machinery**—Today's large equipment sometimes overlaps into other lanes, creating a hazardous situation.
- **Poor Visibility**—Corners, hills, and other blind spots reduce a motorist's ability to see farm and ranch equipment either traveling on the roadway or pulling onto a roadway. Dirty windshields on equipment also reduces operator visibility.
- **Unskilled Operators**—Because of today's large and complicated equipment, skillful operators are a must! The operator must be attentive and react quickly if needed when moving along roadways.
- **Motorists Unfamiliar with Slow-Moving-Vehicle (SMV) Signs**—Motorists may not slow down when approaching a slow-moving farm machine. Because of this accidents frequently occur between farm equipment and motorists traveling in the same direction.

- **Improper Transport Techniques**—Failure to securely tie down equipment on truck beds or transport trailers can cause equipment to slide off when going around a curve or when turning, especially when traveling at high speeds.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

- **Outdated Equipment**—Some older equipment may only have minimal lighting or markings or the lights may not be working.
- **Towing Equipment Too Fast**—The equipment may start to sway, causing the operator to lose control. Towing implements only with a chain can be extremely hazardous, especially if there is no means to provide tension other than applying brakes.

- **Poor Road Conditions**—Potholes, ditches, rough roads, and wash-outs can throw the operator off the machine, or cause the operator to lose control.
- **Extra Riders**—Riders on equipment can fall off and be run over by oncoming traffic, or by the farm machine itself. Dogs and other animals falling out of transport vehicles also create hazards to motorists.

- **Poor Maintenance of Machinery**—Tractors in poor repair, with no brakes or bald tires, are extremely hazardous.
- **Time of the Year**—Heavy seasonal use by equipment and other vehicles such as during planting, haying, and harvesting increases the potential for an accident.

Prevention of Road Accidents

1. Train equipment operators about proper machinery operation and use. The operators should be licensed drivers and should know and obey the laws and rules of safe driving and of farm machinery operation on public roads. The operators must obey the same laws as motor vehicles: stopping at stop signs, signaling direction, obeying speed limits, etc.
2. Maintain equipment properly: check brakes, tires, lights, and steering to make sure they are working properly.
3. Each tractor and piece of equipment must have the proper lighting to be transported or driven on public roads. Make sure these lights can be seen. The American Society of Agricultural Engineers recommends that:
   a. Install two white headlights on front, as far apart as possible, and at the same level.
   b. Mount two flashing amber lights at least 42 inches high in both front and rear. These can be used as signal lights as well.
   c. Place on rear left at least one red taillight. If two red lights are used, mount the other as far right as possible.
   d. Mount two red reflectors that are visible from the rear. If towed or mounted equipment obscures the rear lights, mount two flashing amber lights on the equipment as far apart as possible. Modify older machines to conform to state lighting laws.
4. If a public road crosses your farm yard, install warning signs and/or flashing amber lights at points down the road that can be activated from the house, machine shed, or barn to warn motorists that farm equipment is crossing the road ahead.

5. See and be seen. Clean off windshields and lights. Clear away blind spots where machines enter and leave the roadway so that motorists can see the machinery from a distance (this includes intersections that have tall trees or crops along the road). Turn lights on at dusk or in times of poor visibility such as fog, rain, blowing dust, or cloudy conditions. Use flashers when on roadways. Have pilot vehicles ahead and behind wide equipment. Replace damaged or faded SMV signs.

6. Use slow-moving-vehicle (SMV) signs. This is the universal sign to warn motorists that a slow-moving-vehicle is ahead. Remember that SMVs are to be used on vehicles traveling slower than 25 mph.
7. Before entering the roadway, stop and look both directions. Make sure you have enough time to cross the road or enter the road if traffic is coming or is close. It takes a tractor about 10 seconds to cross a road. A car going 55 mph will travel about 800 feet in that time span. If you have a rear light turned to white for field work, turn it off or to red before entering the roadway.
8. Be aware of the road conditions. Know where the hazards exist before you start, such hazards include potholes, ditches, washouts, narrow bridges, blind corners, and sharp curves. Look out for mailboxes and road signs. Trying to avoid these may cause you to drive in the other lane. Be aware of traffic in both directions. Know how wide your equipment is and the route you are planning to take.

9. Slow down when leaving the road. Turning too fast can whip the towed equipment into the path of oncoming traffic or cause a side overturn.
10. Do not allow extra riders at any time for any reason. Extra riders can be easily thrown off and injured by the farm machine or oncoming traffic.
11. Go down a steep hill in the same gear that you used to go up the hill. This will help maintain control of the machine and the load. Equip large trailers or equipment with separate brakes since your tractor or truck may not have the braking power to stop a free-coasting trailer.

12. Securely tie down equipment to transport trailers and truck beds. When transporting equipment on trailers or in trucks, slow down around curves since equipment may shift and break the chains holding it, especially large tractors or implements. Use trucks and trailers with beds wide and heavy enough for the load. Also, use proper sized chains and tie-down clamps.
13. When towing equipment, make sure it is secure by using safety chains on the tow bars. Use the proper size ball and hitch assembly. Lock tractor brake pedals together to ensure adequate braking on both wheels when traveling down roadways.

14. Maintain speeds that are appropriate for the area, the road conditions, and the time of the year.
15. Prepare implements for transport. Raise hydraulic wings and lock them in place. Relocate hitch points, remove headers, and do what is necessary to make equipment narrower for the road. Also, perform a pre-trip road check on the machinery.
16. Assist large machines, such as combines, with pilot vehicles equipped with flashing amber lights and signs warning of an oversized load.
17. Drive slow moving vehicles as far right as possible but stay on the road. Traveling on the shoulder may be hazardous for two reasons:
    a. Motorists may try to pass in hazardous situations.
    b. The shoulder may be soft or may have ruts or potholes causing the operator to lose control. Slow down to let vehicles pass and get as far over as safely possible. Stop until all vehicles pass you.
18. Stay off public roadways with farm machinery after dark unless absolutely necessary and then only when your vehicle and equipment is adequately lighted for night travel.

REMEMBER:
IF SAFETY IS NOT PRACTICED
IT WON'T BE USED.
SAFETY DOES NOT COST; IT PAYS!

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Preventing Public Road Accidents Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Backhoe and Loader Operational Safety

Backhoes and loaders are useful tools on farms and ranches. Accidents involving backhoes and loaders occur and are often tragic. While accidents may be similar to those that happen to tractors the additonal of an attached backhoe and/or loader increases the likelihood of an accident due to increased height and length of the machine. Common accidents with these machines are overturns, falls, runovers and contact with other people and other objects. Because of the size of these machines and added features, increased diligence is needed to prevent accidents.

Causes of Injuries with Backhoes and Loaders

- **Overturns caused by turning uphill on a steep slope. Turning too fast on a downhill slope may also cause an overturn.**
- **Loaders may overturn if the bucket is raised too high when loaded especially on uneven ground and in turns. The higher the bucket is raised, the more unstable that the tractor is.**

- **Poor maintenance and work around machines. Hazards include leaving shields off or wearing loosely secured clothing while working around turning PTO shafts.**
- **Hitting an object such as a ditch, stump, or hole while moving can cause an overturn or cause the operator or an extra rider to fall off and be runover.**

- **Starting the tractor in gear. If a person is either behind or in front of the tractor wheels they could be run over before they can get out of the way should the tractor move after started.**
- **Falls caused by slipping on the platform or steps while mounting or dismounting or by falling out of the bucket as it is being used to transport or lift a another worker.**
- **A common accident when using industrial equipment occurs when the loader falls on another person or when a load falls due to inadequate ropes, chains, or cables to lift objects, or inattentive operators.**

- **Excavating unstable soil, undercutting a bank with a backhoe, or operating too close to a steep bank or excavation can result in an overturn.**
- **Improper equipment transport. Among the hazards are failure to properly tie down backhoes and loaders to trucks or trailers and failure to have proper lights and slow-moving-vehicle signs. Not observing traffic rules when on public roadways also can cause accidents.**

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Preventing Injuries from Backhoes and Loaders

1. Slow down when conditions dictate to do so. Some examples are traveling on rough ground, going up or down a slope when towing or carrying heavy loads, when entering public roadways, and when turning with a load in the bucket.
2. Know the machine that your are operating. Read and review the operator's manual. Get familiar with the controls before working with the backhoe or loader.
3. Know the area where you are operating. Locate ditches, stumps, debris, and undercut banks and avoid these hazards by keeping a safe distance away.
4. When front-end loaders carry high loads, be aware of overhead obstacles such as power lines.
5. Keep the bucket as low as possible to ensure stability and increase your visibility and to become aware of bystanders. Raise the loader only when necessary to dump.
6. When excavating with a backhoe, never undercut the area beneath the backhoe stabilizers. If you suspect the soil is unstable, use a platform under the rear wheels and stabilizers to prevent cave-ins.
7. Do not allow extra riders **PERIOD**.
8. Make sure that the machine is not in gear before starting. Always start from the driver's seat. Make sure no one is in front of the wheels when starting the machine. Do not bypass safety systems that prevent the newer tractors from starting when in gear.

9. Add ballast or rear weight when a heavy load makes this precaution necessary.
10. When excavating with the backhoe on a hill, swing the backhoe uphill to dump the load in order to maintain stability. Dumping downhill may cause the machine to tip.
11. Always shut off the engine, lower the bucket and backhoe, and apply the parking brake before dismounting the machine.
12. Use extreme caution when back filling. The weight of the fill material added to the weight of the loader could cause the edge of a new excavation site to collapse. Before starting to back fill, walk over the area and test the soil for stability.

13. Keep steps and platforms clean and uncluttered of parts, tools and debris. Do not mount or dismount when the machine is moving. Wear proper footwear with good gripping soles.
14. Never use a front end loader as a man lift as the hydraulic system may fail or someone can accidentally touch the controls causing the worker to fall. Use proper lift equipment for the job.

15. Use machines equipped with roll over protective structure (ROPS) and seat belts. Seat belts will prevent the operator from being thrown out and crushed in a rollover.
16. Be sure the area is safe and clear of bystanders before you start excavating or moving the backhoe. Keep rear-view mirrors clean and in good condition. Use back up alarms when in reverse gear.

17. Know you equipment and its capacity. Train all workers in proper, safe operation of the equipment. When lifting objects, use cables and chains in good condition and strong enough for the job. Do not allow a person to walk or work under a raised load.
18. Operate the backhoe or loader only from the operator's seat.
19. When transporting equipment, be alert to potential hazards, caused by poor visibility, adverse ground conditions, excessive speed, unstable loads, or other vehicles in the area. Use slow-moving-vehicle signs on the tractor and have the proper lights: flashing yellow and solid red for the rear and flashing yellow lights for the front as well as headlights. Turn headlights on when transporting on public roadways. **Slow down**. Travel only as fast as conditions allow.
20. Be aware of the environment around you at all times. This includes low hanging power lines, tree limbs, bridges, or other obstacles. Know where gas, power, and phone lines are buried before you start to dig.

21. Be careful when lifting round objects such as bales, poles, etc., in the bucket. Raising the bucket too high or tipping the bucket too far back could result in these objects rolling rearward down the loader arms onto the operator.
22. Visually check for hydraulic leaks or malfunctioning parts.
23. Make sure hydraulic lines are connected properly after repairs, otherwise an accident is likely to occur when a control operates in a direction other than it should.

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Backhoe and Loader Safety Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Safe Harvesting Operations: Preventing Accidents While Harvesting Hay and Forages

Harvesting hay or other forage crops involves many different operations. These range from driving tractors, trucks and hay conditioners; to loading, transporting and unloading crops; as well as transporting equipment; and making repairs in the shop or in the field. Because of the many types of machines used, number of people and different operations involved, accidents can and do occur during this busy season. Producers and managers need be aware of the many hazards involved and stress safety to family members and field workers.

Causes of Accidents While Harvesting

Tractor Overturns

This is the No. 1 cause of injury and death on the farm or ranch. Tractors will overturn in many ways such as traveling too fast around a corner; driving along a steep slope; pulling an unstable load (such as a load of loose bales that shifts when going around a corner); a front-end loader that is carried too high; hitting a hole, rut, or debris in the field; or trying to free a tractor or truck that is stuck.

Improper Use, Hitching, or Maintenance of Implements

Harvesting forage and hay involves mowers, rakes, balers, stackers, harrowbeds, loaders, and other machines. All have moving parts that can easily entangle a person who comes in contact with them. If these are used improperly, such as a platform for standing or riding, the result could be falls and runovers by the tractor or the implement. Improper hitching of the implements could cause the tractor or truck to overturn. Improper maintenance may result in loose parts flying off and striking bystanders or workers. Trying to unclog a machine when it is still running is a major reason for serious accidents.

Working in Unfamiliar Fields

Hitting a hole, rut, or stump may cause an overturn, or throw the operator from the platform of the tractor and cause an accident.

Unsafe Transport of Equipment

Going too fast, not having clear sight when turning onto the road, failure to have the proper signs and lights, and not driving defensively all contribute to accidents. Driving on the shoulder—half on the road and half off—is dangerous since it encourages people to pass in possibly unsafe or dangerous situations.

Lifting Bales onto a Truck or Wagon

Sudden movements by the truck or tractor can throw workers off balance. Workers can fall off the platform and be run over by the machine, or they can lose control of the hay bale causing it to fall off the platform and strike a worker.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Prevention of Accidents While Harvesting (Setting up for a Safe Harvest)

1. Remove stumps, stones, or other debris from the field, or clearly mark them to prevent upsets, turnovers, and damage to equipment. Also mark ditches and banks. Some banks are undercut. You need to be aware that what appears to be the edge may not be solid, but that there may be an open space below it.

2. Slow down when working on hillsides. Plan harvesting so that equipment travels downhill on steep slopes to avoid overturns. Space tractor and equipment wheels as far apart as possible when operating on slopes.
3. Keep equipment well maintained and in good repair. Keep all shields in place, especially the PTO shield. Keep platforms clear of debris. Never mount or dismount a machine when it is moving. Make sure all machines are hooked up correctly—do not hook up a 540 rpm mower to a 1,000 rpm PTO. Operating a mower or forage harvester at excessive speed can cause machine failure and possible injuries from flying debris if parts fail.
4. Never try to unclog a machine when it is still moving or in operation. For that matter, never attempt to work on any machine for any reason while it is still in operation or running. Several machines involved in harvesting forages have cutter bars, augers, reels, crimper rolls, and other moving parts. There are different safety precautions for each of several different machines.

   Cutterbars: Stop the tractor and disengage the PTO. Raise the cutterbar and back up. Shut off the engine and engage the parking brake or shift the transmission into park (or neutral). Pull hay away from cutterbar. Check for broken guards or knife sections. Lower cutterbar. Start engine and engage PTO at low speed. Ease mower into standing hay and resume operation.

   Reels, Crimper Rolls, and Augers: Stop the engine and disengage the PTO before doing any work on them. Wait until the part has stopped moving. Back the material out of the equipment to unclog the unit.
5. Although balers and bale handling systems have different parts, the same techniques apply when working on balers and bale handling systems. Disengage the PTO after shutting off the tractor. Wait for the flywheel and other moving parts to stop. Test the bale-knotter by turning the shut-off system by hand to see in slow motion what is happening with the bale-knotter. Keep hands away and observe. The same safety precautions apply to round balers. Bale ejectors are for throwing bales or rolling them into place. Never allow someone to stand behind or work on the ejector while the PTO and engine are operating.
6. When loading bales manually, be sure that the driver does not start and stop suddenly. This can throw workers off the wagon or truck. Make sure

workers do not ride on top of the stack. They could fall off and be run over. Instruct workers to be aware of the stack condition and where fellow workers are throwing the bales. Bales falling off the stack can strike a worker and result in a serious injury.

7. Block or secure machines such as headers, bars, stackers, when working on them. Block the wheels too. This will keep the machine from falling or rolling on workers as it is being repaired.

8. Many machines have hydraulic systems that can potentially cause serious injury if not kept in good repair and handled properly. Keep fluid clean and check often for damage to the system. Use a piece of cardboard to check for hydraulic leaks, as the high pressure can penetrate the skin. Many machines also have belts and chains. Keep these in good repair and have the right tension on them at all times.
9. Be sure the tractor has front end ballast. This will prevent the tractor from tipping backwards.
10. Big balers form bales weighing as much as 2,000 pounds. Do not eject bales where they might start rolling. Not much will stop a 2,000 pound bale if it starts to roll. Observe all safety precautions regarding to the PTO and the hydraulic systems. Do not let anyone stand near the rear of the baler when a bale is coming out. Again, stop the engine and disengage the PTO before dismounting to work on the baler.

General Safety Reminders

1. **Know your machine! Read the operator's manual before a machine is operated for the first time. If the machine has not been operated for a long time, first get familiar with the machine's operation.**

2. **Wait! Be sure the harvester is completely stopped before hooking up any wagons, doing any repairs, or servicing or unclogging the header or other parts. This is especially true for the cutterhead, auger, rollers, crimpers, and PTO shafts. *These parts may continue to rotate for several minutes, even after the engine stops.* Do not open shields until these parts have completely stopped. Keep all doors and shields tightly latched during operation. Replace or repair all damaged shields.**
3. **Stay out of danger! Never stand under or near the discharge spout of harvesters. Hard objects can become dangerous projectiles.**

4. **Take your time! Do not be in a hurry. Slow down and be safe.**

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Harvesting Hay and Forages Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Preventing Accidents While Harvesting Small Grains

Safety procedures for harvesting small grains have unique concepts that must be learned and followed in order to ensure a safe and productive harvest. Every year new safety devices and procedures are developed to make combines and other equipment safer to operate. However, responsibility for safety remains with the operator. Each operator must be aware of hazards and remain alert to situations that are potentially dangerous.

Safety Procedures for Combines

Safety Before Starting

Before attempting to start the combine the first time each season, study the operator's manual. It has operating information and specific safety recommendations for that particular machine.

Regular maintenance is important. Clean the combine to remove trash around the exhaust system, which can cause fires. Tools and debris on the platform or in the cab can lead to injuries from slipping or tripping and falling. Open the doors of the machine shed if the combine has been stored inside. This will prevent fumes from injuring workers.

Check tire pressure each day. Under-inflation can cause the tire to fail. Over-inflated tires can cause more "bounce to the ounce" resulting in loss of control.

Check the brakes once a week. With hydraulic brakes, make sure the master cylinder is full and not leaking and that no air is in the lines.

Check the cylinder rocking bar to see if it is clear of the cylinder. Make sure all shields are in place. Always use the hand rails for mounting and dismounting.

Starting the Combine

Before mounting the combine, make sure everyone is clear. Even after getting into the operator's seat, open the cab door and shout, "is everyone clear," and wait for a reply if you are working with someone. Do not allow extra riders on the machine with you.

Before starting the combine: sound the horn (if it is equipped with one), disengage the header drive, disengage the separator drive, place the gearshift in neutral and depress the clutch pedal. Because starting fluid is extremely flammable you need to be careful if using starting fluid on diesel engines.

Operating Safety

Combine operation requires constant attention by the operator. Never operate the combine in poor health or if you are sleepy. Keep alert at all times. Wear proper protective equipment and clothing, such as appropriate footwear.

Check the field before harvesting for ditches, debris, fences, bank overhangs, and other obstacles. Be aware of the weather conditions.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Slow down when operating or turning on hillsides, and avoid sharp turns. Slow down when you have a full grain tank. This makes the combine top heavy and more subject to rollovers, especially if grain tank extensions are used.

Always sit down when operating a combine, especially over rough ground. Be careful when activating the leveling devices on a hillside combine. When using the brakes to make sharp turns, slow down and always turn the steering wheel before applying the brakes to assist turning. Failure to do so can cause the combine to swerve and turn dangerously.

Field Repair and Maintenance Safety

Always keep the machine clean to prevent fires and falling. Before doing any repair or servicing on the combine, turn off the engine, disengage all drives, and wait for any moving parts to stop completely. Never try to unclog a machine when it is still operating or moving. Stay clear of all moving parts. Corn headers can pull material 12 feet long through in one second—faster than you can let go.

Wear protective gear and clothing: ear plugs, eye protection, head protection, and proper fitting clothing and footwear.

Use proper lifting techniques when lifting heavy parts.

When working on the header, block it up with supports. Never rely on the hydraulic system alone to hold the header up as it may fail. Use secure supports when working on any part of the combine that can move or fall.

Keep all shields and safety devices in place and in proper operating condition. Keep all belts, chains, and other adjustable items aligned and in good condition.

Install a spark arresting muffler when operating in dry fields. Avoid sparks or flames when working on the battery. The hydrogen gas emitted by the battery may explode.

Refueling and Fluids

Always try to refuel outside of the field. Do not smoke or allow any flames nearby when refueling. Allow the combine to cool before refueling. This includes the engine, the cooling system, and the exhaust system. High-pressure fluid leaks in the hydraulic or diesel fuel system are extremely dangerous. The leaks can be small and not seen and can penetrate the skin. When checking for leaks, use a piece of stiff paper, cardboard, or wood.

If injury does occur, seek medical help immediately. Always carry a first aid kit. Keep at least one 2A 10BC Dry Chemical Fire Extinguisher on the combine at all times.

Stopping the Combine Safely

Disengage all headers, drives, and put gear shift in neutral. Lower the header. Apply the parking brake. Remove the ignition key to prevent accidental starting or to prevent tampering, especially when working on the machine or when it is parked. The hydrostatic drive unit is **not** an effective parking brake.

Transporting the Combine

For long distances, haul the combine on a flatbed truck or trailer. When towing a combine make sure the load is secure. Slow down; be aware of the dangers of driving in towns, narrow roads, bridges, under low bridges, low power, or telephone lines, and adjust for general weather and road conditions. When driving the combine on roads, use the flashing lights, rear tail lights, slow moving vehicle signs, and headlights and have a pilot car in front and back with flashing lights.

Always lock the brake pedals together to ensure adequate, even braking. Be careful when applying brakes if the header is still attached. The added weight of the header could cause the machine to tip forward and even crash into the ground or preceding vehicles. Put the unloading auger in the transport position, making sure it does not interfere with the safety lights.

On *self-propelled* combines, ***never*** use the header safety support when transporting the machine. Raise the header enough for safe ground clearance, but not high enough to reduce visibility. **On *pull-type* combines**, ***always*** use the header support when transporting the machine.

Slow down when making turns, always plan your route and know where there may be dangerous corners or poor visibility. Never coast downhill; go down hill in the same gear with which you used to go up the hill. When the combine is moving, you cannot shift it back into gear. Always maintain control of the machine.

Safe Towing

Never tow the combine at speeds higher than 20 mph. Always keep the transmission in neutral or the "tow" position if the combine is so equipped. Never tow a combine equipped with hydrostatic drive since towing can cause damage to the drive unit.

General Safety Reminders

1. **Know your machine! Take time to review the operator's manual before the harvest season.**
2. **Keep alert! Get plenty of rest at night and take frequent rest breaks during the day.**

3. **Prevent fires! Keep the combine clean and refuel the machine after it has cooled off. Keep a fire extinguisher on hand.**
4. **Wait! Make sure all moving parts are stopped before working in them. Replace all shields.**
5. **Be aware! Know the conditions of the field you are operating in. When on the road turn on the warning lights and be aware of traffic approaching from the front and rear. Before starting or moving the machine make sure everyone is clear.**

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Small Grain Harvesting Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

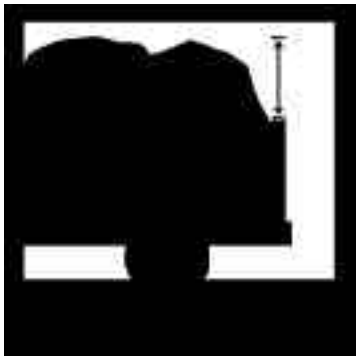
Truck Safety:
Preventing Accidents with Trucks and Trailers

Transporting crops from the field to the storage or processing center is an important part of the farm operation. Farm trucks compete with other drivers on the road and are susceptible to accidents due to infrequent operation, poor roads or driving conditions, inexperienced drivers, and poor equipment maintenance. Proper maintenance and training are important to prevent a potentially serious accident.

Causes of Accidents

- **Truck Overturns**—Major causes of accidents are driving too close to ditches or on soft shoulders, driving on slopes with an uneven load, and raising the truck bed on uneven ground.
- **Crushed by the Bed**—Failure to block a raised bed while working on the hoist can result in the bed coming down on a person.

- **Backing**—About 25 percent of accidents involving trucks are a result of backing over a person or into an object.
- **Vehicle Collisions**—Accidents resulting from poor brakes, nonworking signals, or driver fatigue are common during the harvest season.
- **Transporting Equipment or Other Materials on Trailers**—Failure to load and secure equipment or other materials properly can cause the load to either fall off trailers or cause the towing vehicle to lose control.



- **Overloaded Trucks or Trailers**—Overloading trucks or trailers puts additional strain on the vehicle, particularly the brakes and tires. Towing a trailer with a weight heavier than the towing vehicle will lead to loss of control, especially down hills.
- **Loads That Shift Weight**—Livestock will shift weight when turning corners or when making sudden swerves. Liquids in tanks will slosh back and forth if no baffles are installed in the tank. Maintaining the control of a truck is difficult when weight slips especially on poor road conditions.

Prevention of Truck and Trailer Accidents

Trucks

1. Proper maintenance is important for truck safety. Daily inspection should include checking tire pressure and condition, brake and all other fluids, lights and turn signals, as well as making sure that windshields are clean and mirrors are clean and adjusted properly.
2. Be familiar with the truck operation and driving characteristics before operating the truck (e.g., room needed to make a turn or how high the bed will be raised. New drivers need to have a valid driver's license and be trained before hauling loads. Drivers need to be aware that a loaded truck will take longer to stop than other vehicles.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

3. Follow all traffic laws established for the state.
4. Drivers need to be alert when driving any vehicle especially a truck. A loaded truck takes longer to stop and get up to highway speed than other vehicles. Cars pulling out in front of trucks are common, making it necessary to slow down. Drivers need to take frequent safety breaks such as stretching and breathing deeply. Getting out and walking around the vehicle helps. If feeling drowsy, stop and have some coffee or soup—**don't drive**.

5. Increase the following distance from other vehicles on the road. Use the 4-second rule—count 1001, 1002, 1003, 1004.
6. Keep the same distance away from a ditch as the ditch is deep in fields on unstable roads.
7. Do not drive on soft shoulders of road-ways because the shoulder can give way causing a loaded truck to tip over.
8. Be aware of the conditions of the field. Make sure that drivers are aware of any potential problem areas in a field.
9. On hilly terrain drive trucks on top of hills. Travel as much as possible straight up or down hills. Traversing a hill with a load will cause a problem especially if the load is concentrated on the down-hill side. Keep the load evenly distributed. On extremely hilly ground it is better to bring the combine to the truck than drive the truck to the combine.
10. Make sure that approaches and bridges are adequate to carry the weight of a loaded truck.
11. Regularly inspect brakes on semi trailers.
12. Be aware of the "blind spots" in mirrors, especially when turning and changing lanes.
13. Sound horn when backing to indicate your intentions. Be aware of others in the area. In a congested area either have a spotter direct you or get out of the cab and look over the situation before backing up. Consider installing backup alarms.
14. Be aware of children in the area. Before moving a truck know where the child is at all times.
15. Be aware of the characteristics of the load that is being carried. Livestock will have a tendency to shift during turns while in transport, liquids will slosh if the tank is not full, and high loads may come into contact with power lines or tree branches.
16. Load and unload equipment using a solid loading ramp. Trying to drive onto a trailer or truck from a roadbed is risky and has been a cause of many accidents.
17. Before loading a truck or trailer be sure to use wheel chocks to prevent the truck from moving while being loaded.
18. Do not overload a truck. An overloaded truck is hard to steer and stop. Also, the additional weight puts stress on the tires, suspension, cooling system, and drive train.
19. When parked set the parking brake and move the shift lever to the neutral position if the engine's running and put in gear when engine is stopped.
20. Always block or brace the bed of a truck when working on it in the raised position.
21. Make sure load clears overhead obstacles such as power lines, bridges, and overpasses.

22. Only raise a loaded bed on level ground. A raised bed rises the center of gravity. Side overturns are common on sloped ground or when a truck makes a turn with the bed raised.
23. Maintain conveyer belts and pulleys in beds equipped with them. Make sure electrical connections are in good condition and wired and grounded properly for the site that they will be used.

Trailers

1. Make sure trailers are properly hitched to the towing vehicle. Use safety chains and attach the lighting connector. Make sure signal lights work properly.
2. Inspect tires and wheel bearings before each use. Make sure bearings are properly lubricated. If the trailer has brakes inspect them daily and make sure all connections are in tact.
3. Load and unload on level surfaces. **Always** make sure the brakes are locked before loading.

4. Use tie downs or chain binders to secure loads to the trailer. Check bindings after you traveled some distance to be sure the load has not shifted.
5. Load trailers properly. Put about 60 percent of the load toward the front. Too little weight in the front will cause the trailer to fishtail. Too much weight will cause the hitch to drag and may raise the front of the towing vehicle, which reduces steering control.
6. Keep decks free of dirt, oil, and debris. Steel decks can be slippery when wet, and extra caution is needed when loading and unloading.
7. Do not overload the trailer. Make sure the truck will be able to handle the load. Check the owner's manual of the truck for gross vehicle weight and other information regarding towing capacities.
8. When towing a trailer down a hill use the same gear and speed as when going up the hill.
9. Make sure tilt beds are in the locked position before moving.

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Truck Safety Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Agricultural Machinery Maintenance: Preventing Shop Accidents

Equipment maintenance and repair is necessary to avoid down time and to minimize major repairs. However, maintaining and repairing machines can lead to serious injury. Workers should be trained in shop safety and have the proper equipment to minimize or even eliminate the impact of shop accidents.

Causes of Injuries When Repairing Machines

- **Improper Lifting**—By lifting incorrectly or lifting items that are too heavy or awkward causes back injury that results in lost work time or even permanent disability.
- **Poorly Maintained Tools**—Using tools, such as chisels with mushroomed heads, could result in a piece of metal flinging off and hitting a bystander or the worker. The ragged edge of the tool also can cut workers.
- **Improper Hydraulic System Maintenance**—Hydraulic systems can produce pressures of over 2,000 pounds per square inch. Pinhole leaks in a hydraulic system under this pressure can easily penetrate skin. Always use a piece of paper or cardboard to locate leaks along hydraulic lines.
- **Using the Wrong Tool for the Job**—Sometimes we are tempted to use a wrench as a hammer, but the wrench can glance off the object and cause serious injury.
- **Unsafe Repair in Field**—Many accidents occur when repairing machines in the field without stabilizing them so that the machine will not roll or fall and crush the worker.

- **Dropping Heavy or Sharp Objects**—Heavy or sharp objects that are dropped on hands, feet, head, or other parts of the body can cut, smash, or crush. The worker who fails to wear gloves, hard hats, steel-toed shoes, or other protective gear often suffers the worst injuries.
- **No Safety Shields**—Shop equipment and tools should have the proper shielding in place, such as grinding wheels with the protective aids. Fragments of the wheel or tool being ground can fly off and injure someone.
- **Bad Wiring**—Substandard or obsolete wiring in the shop can cause severe electrical shock and even death. The old two-wire outlet and older power tools do not provide a ground, thus exposing the worker to the potential of an electrical shock.
- **Unsafe Work Areas and Habits**—Examples of unsafe conditions are such things as incorrect use of a ladder, not blocking hydraulically-supported machinery when working on it, working in an elevated position without proper footing, not using the right supports or safety equipment, and cluttered work areas.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

- **Personal Protective Equipment**—Not wearing the necessary protective equipment and clothing for the job results in many injuries each year. Protection may be needed for eyes, ears, head, feet, hands, and the body for certain jobs. Loose, dangling clothing can become entangled in machinery causing severe injury and even death.

- **Repairing Machinery While Running**—Trying to unclog a machine while it is running, tightening a bolt, or doing other repairs is an accident waiting to happen. Serious or even fatal injuries may result in you being crushed, cut, or pulled into machinery at shear points, crush points, pinch points, wrap points, and pull-in points of the machine. Servicing springs is also dangerous because of the stored energy in springs.
- **Poorly Maintained Work Area**—Leaving oil or other fluids or debris on the floors and work benches can cause falls.

Prevention of Injuries When Repairing Machines

1. Develop safe work areas, good habits, and establish good housekeeping practices.
2. Train workers and family members and encourage safe work habits.
3. Maintain machinery properly and promptly when repairs are needed. This eliminates down time and worker exposure to hazards of repairing machines. Read operating and repair manuals and keep them handy. Study manuals to know how to perform the task at hand, and train your workers to study them also.
4. Slow down and take time to think. Visualize what steps need to be taken. Do not rush a job! Accidents happen when the workers hurry to get a machine back into production and they do not take the time to be safe.

5. Turn off the machine when working on it. Prevent others from accidentally starting the machine by removing the keys or the battery cable. Lock the brakes and stabilize the machine as best you can by using blocks in conjunction with the machine's own safety devices. Do not use a jack alone to stabilize a raised machine! If the work can't be done without the proper support, do not work on the machine until you can properly support it.
6. Keep shields and guards in place. Replace them when they are damaged or missing. Remember to put back guards and shields that were removed for repairs.
7. Wear proper clothing and protective gear. Do not wear loose, dangling clothes that can become entangled in moving parts. Wear protection appropriate to the job such as gloves, eye protection, ear protection, hard hats, and steel-toed shoes. Wear welding masks and goggles, gloves, and leather aprons when welding. If working with chemicals, wear the protective equipment specified by the label.

8. Use ladders properly. Firmly place the ladder on the ground with a distance away from the wall no more than 1 foot for every 4 feet of height. Do not use metal ladders near power lines or other areas that may cause electrical shock.

9. Lift objects correctly. An injured back means lost work, pain, and/or disability. Lifting subjects the back to its greatest stress. Train your workers to lift properly. Keep the back straight while using the legs to lift the object. If heavy objects are to be lifted, provide back supports for workers. Better yet—use mechanical lifting devices.
10. Have a hazard-free shop. A well-lit, clean work bench and work area, along with a regular cleaning schedule of the shop area, will go a long way in eliminating hazards. If your shop doesn't have proper wiring, install an up-to-date electrical system in the shop including a grounded 120 volt three- wire outlet system with a ground fault circuit interrupter available for outdoor use or in areas that may be wet.

11. When working on electrically powered equipment, lock out the control box to prevent someone from accidentally turning on the equipment while someone is working on it.
12. Isolate hazardous work areas. Have a proper storage area for paints, pesticides and oily rags. A separate area is needed for welding with a fan to vent gases from welding. Keep compressed gas welding cylinders in a safe area and secured so that no one can accidentally knock cylinders over and accidentally break off the valves, which could cause an explosion. Keep protective clothing and gear on hand for all operations. Know where it is and how much you have!
12. Be aware of common safety hazards. Look around and spot potential accidents and eliminate the hazards as much as possible. Take the time to look where you are going: not only ahead, but behind, to the side and above. Remove a potential hazard. It is much cheaper to take a few extra minutes and remove a hazard than to pay for the hospital bills or worker's compensation if a worker is hurt on the job.

REMEMBER:
IF SAFETY IS NOT PRACTICED
IT WON'T BE USED.
SAFETY DOES NOT COST; IT PAYS!

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Preventing Shop Accidents Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Using Hand Signals to Prevent Accidents

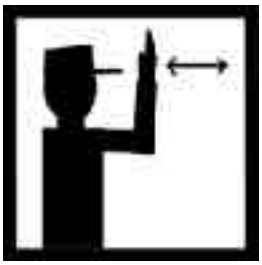
Often noise from tractors and other farm equipment prevent operators from hearing or communicating with others. Hand signals provide an excellent way to inform workers of the operator's intentions or for the supervisor to give instructions to the workers on various operating procedures. The American Society of Agricultural Engineers has established a set of hand signals for farm machinery operators. All family members and workers should learn and use these signals. Hand signals along with radios and other communication devices can be part of a total farm and ranch communication system.

Hand Signals

- **Start the Engine**—Move arm in a circle at waist level, as though you were cranking an engine.

- **Stop the Engine**—Move your right arm across your neck from left to right in a "throat cutting" motion.

- **Move Toward Me/Follow Me**—Look toward vehicle or person you want moved. If more than one person or vehicle is present then point to the one you want to move. Hold one hand in front of you, palm facing you, and move your forearm back and forth.



- **Come To Me** (May mean "Come help me" in an emergency)—Raise arm straight up, palm to the front and rotate the arm in a large circle.

- **Move Out/Take Off**—Face desired direction of movement. Extend arm straight out behind you, then swing it overhead and forward until it's straight out in front of you, with the palm down.

- **Speed It Up**—Clenching your fist, bend your arm so that your hand is at shoulder level. Thrust arm up and down several times.

- **Slow It Down**—Extend arm straight out to the side, palm down. Keeping arm straight, move it up and down several times.

- **This Far to Go**—Raise hands in front of body, palms facing each other. Move hands together or farther apart to indicate how far to go.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

- **Raise Equipment**—Point upward with forefinger, while making a circle at head level with your hand.

- **Lower Equipment**—Point toward the ground with the forefinger of one hand, while moving the hand in a circle.

- **Stop**—Raise arm straight up, palm to the front.

Traffic Signals

Hand signals are widely accepted for traffic movement and direction. Standard traffic signals should be used by tractor operators when driving tractors and when transporting equipment on roadways. This is especially true when operating a tractor without a cab and that does not have turn signals. The operator needs to clearly indicate direction and intentions when on roadways and these signals should be understood by all motorists.

- **Stop**—Lower left hand down to the side, palm to the rear.

- **Left Turn**—Extend left hand and arm straight out.

- **Right Turn**—Raise the left hand up while bending the elbow.

Hand signals provide a means for communicating with workers in a noisy environment and with traffic on roadways. Clear, understandable signals can also prevent workers from being injured when they cannot hear or see the signalling devices on the machine, provide everyone knows and uses them.

Written by Tom Karsky, University of Idaho. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Hand Signals Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Electrical Safety

Electricity serves an important function on farms and ranches. It has proven to be a valuable servant to perform such tasks as lighting, heating, crop processing, and irrigation pumping, as well as many other tasks. Because it is so commonly used, we tend to take it for granted and many times fail to recognize the potential dangers that may be present with electricity. It's this common complacency that often leads to accidents related to electricity.

Causes of Accidents

- **Faulty wiring in buildings is a common cause of injury on farms and ranches. Often the wiring system is outdated or not kept up-to-date for it to handle current loads. Corrosive environments and rodents cause wiring to decay and create a hazardous situation.**
- **Power cords that are frayed or have wires exposed is common. Cords are exposed to heavy foot and vehicle traffic and other abrasive actions that cause wires to be frayed, thus exposing them.**

- **Faulty wiring on irrigation systems and other high voltage sites have the potential to cause serious accidents and electrical burns. Many sites have voltages that range from 430 or more. Corrosion and poor grounding are leading causes of injury.**
- **Poorly grounded tools or tools that have shorts or other electrical malfunctions cause many electrical injuries. Often work is done in wet or dusty environments.**
- **Contact with power lines by loaded trucks, augers, irrigation pipe, and other farm equipment causes many injuries and deaths. Overhead wires are a common fixture in the farm and ranch setting and in fields. Often the location of wires overhead is not realized until it is too late.**

Prevention of Accidents

1. Have the wiring checked by a competent electrician. Proper grounding is important in a farm or ranch work environment. Be sure the wiring system is able to handle the loads that will be used. This includes the outlet boxes and the service entry boxes. Be sure the circuit breakers are in good shape and not corroded. All wires should have the insulation on. Check for mouse nests and damage to wires.
2. Use recommended fuses or circuit breakers for circuits. Do not overload a circuit. If the fuses or circuit breakers continue to "blow" do not replace them with larger ones. Add another circuit.
3. Protect wiring from abrasive and corrosive environments by placing it in conduit or inside of a protective shield. Keep mice out of the electrical components since mice can eat the insulation material.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

4. Use explosion proof fixtures in dusty environments such as a feed grinding area.
5. Check all extension cords for damage and be sure the ground prong is attached. Use an extension cord that is the same size or larger than the cord on the tool or motor being used. Keep cords out of foot and vehicle traffic areas as the constant contact with the cords can cause abrasion and expose wiring. Also, cords can be a tripping hazard.
6. In outdoor or moist environments use a GFCI (Ground Fault Circuit Interrupter) to prevent electrical injury should a short occur in the tools being used.
7. Inspect power tools and cords often. Repair or replace defective power tools, and never use a tool that is known to have a short in it.
8. Do not use metal ladders when working around power lines.

9. Locate overhead power lines away from work areas such as around grain bins where augers will be moved from bin to bin. Consider placing power lines underground that pose potential problems such as in grain storage and other crop storage areas. If a live power line falls on a metal grain bin the whole bin can be electrified creating a hazard to anyone who comes in contact with it.
10. Make a map of all underground power lines and make sure your workers have access to this information.
11. Prune trees away from power lines. The power company may be able to assist you with this.
12. Before opening a high voltage power panel, such as an irrigation system panel to inspect it or to turn on or off the current, always brush the back of the hand against the panel. This will allow you to free yourself from the panel if electrified. If you grasp it and the panel is electrified, then it is possible the current flowing through you will not allow you to let go of the panel.
13. Have a competent electrician check the wiring for irrigation pumps and motors before each irrigation season. Be sure that it is properly grounded.
14. Locate irrigation pipe storage areas away from overhead power lines. Before moving irrigation pipe, always look up.
15. Be aware of power lines during harvesting or haying operations as raised equipment or loaders can come into contact with power lines. Never place bale stacks under power lines.
16. Be aware of clearance of tall equipment such as combines, cultivators, and raised grain augers from power lines. Have an observer watch for clearance when moving under low overhead lines to prevent contact with the wires.
17. Always turn off the electrical power and lock out power boxes when doing repairs or maintenance on an electrically powered device to prevent another person from turning it on and causing an accident.
18. Before using standby generators for emergency power install a transfer switch to prevent power from entering the power utility lines, which will present a hazard to linemen working on the lines. This switch also protects your generator.

19. Before digging with a backhoe or shovel know where the underground power lines are located.

Prevention of Further Injury or Death

1. Make sure family members and workers have training in CPR and First Aid.
2. All family members and workers need to know where the main electrical shut off switch is located.
3. Have fire extinguishers on hand that will handle electrical fires. Use a general purpose dry chemical fire extinguisher on electrical fires. **Never use water.**
4. If another person is electrocuted by a power line or tool or appliance, do not remove the person until the power is turned off or wire removed. Do not remove a live wire with a dry board as paint can conduct electricity. Call the power company. They have the equipment to do it safely.

Written by Tom Karsky, University of Idaho. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Electrical Safety Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Medical Emergencies: Farm and Ranch Emergency Response

Farm and ranch accidents can and do occur. Being prepared for medical emergencies is important. Knowledge of basic first aid is vital to rural residents since rescue personnel have to travel much longer distances in rural areas than in the city. A typical emergency response is a few minutes in a city compared to one-half to several hours in rural areas. Also compounding the issue is that injured persons may not be discovered until hours after the injury because of the remoteness of the work areas.

Knowing what to do in the time before help arrives may make the difference between life or death or how well the victim recovers after the accident. We must make a conscious effort to be prepared for emergencies, however remote the possibility of an injury may seem.

Areas of Basic Knowledge and Preparedness

- Have at least one or two family members and workers trained in basic first aid. Ideally all workers and family members should be trained in first aid. If only one or two people are trained and they are hurt or not around, then the victim is in trouble. Be sure they keep their training updated. (CPR annual, Basic First Aid bi-annual)
- Everyone should know what to do in an emergency. Develop a plan: know what to do in case of an accident, health problem, and a natural disaster. Have this plan on file and update the plan on a regular basis. Practice the training and plans on a regular basis so that workers have these concepts in their minds always. Knowledge and preparedness are the best way to fight fear and panic and help everyone be calm in an emergency situation.
- **Rely on the experts**. When confronted with an emergency, assess the situation carefully and decide what to do and in the correct order. Speed is vital in most cases, but remember, first aid is only temporary, on-the-spot assistance. It is not a substitute for expert medical care.
- **Post all emergency numbers** near the telephone. **Write down exact directions** to the farm or ranch including road numbers and landmarks so that anyone can give the directions to the dispatcher.
- Know what to do at the **scene of an injury**.
  1. **Protect yourself**. Assess the situation. If a dangerous situation exists then do not attempt to assist the victim until the situation is under control. If you are injured then you will not be able to help the victim. Get help if needed.
  2. **Stabilize the scene**. Make sure that the situation does not get worse and cause additional harm to the victim. For example, shut off fuel lines, turn off the engine, or block raised components.
  3. **Stabilize the victim**. Use the ABC's of first aid—Airway, Breathing, Circulation. Make sure the victim is able to breath and that the airway is not obstructed. If the victim is

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

not breathing, perform rescue breathing. If the heart is not working perform CPR. Control bleeding and check for broken bones.

4. **Call for help as soon as possible**. **Do not attempt to move the victim** unless there is a danger to the victim (e.g., fire or explosion). Moving the victim may make the injury worse, especially with spinal cord injuries. Describe to the dispatcher the nature of injuries and situation so that the emergency response team can bring the right equipment.
5. If possible **have someone watch for emergency personnel** and direct them to the injury scene.

Wait for emergency personnel to transport the victim. If a **cellular phone** is available take it to the injury site so you can get assistance over the phone until emergency help arrives or to help rescue personnel to find the site.

Emergency Procedures for Specific Accidents

Tractor Rollovers

1. Fire is a constant threat because of fuel leaks on a hot engine in an overturn situation. Shut off the fuel supply and have an ABC-type extinguisher available.
2. Shut off engine and remove the key—even if it isn't running. Rear wheel movement could restart the tractor. Turn off the fuel supply valve.
3. Block or crib the tractor to prevent further movement and prevent additional injuries from occurring.
4. Unless trained for rescue wait for emergency personnel to extricate the victim.

PTO (Power Take Off) Entanglement

1. Spine and neck injuries are common with accidents involving PTOs if the victim's body is wrapped around the shaft. Proper stabilization by emergency personnel of the victim is necessary to prevent further injury.
2. Turn off the power and block the implement to ensure firm support. Secure the implement to prevent movement. Do not attempt to disengage the PTO as this can release pressure and create additional injury to the victim.
3. Unless trained for rescue, wait for emergency personnel to extricate the victim. Do not attempt to cut away clothing wrapped around the shaft as this may act as a tourniquet and stop bleeding. Remove clothing only if it restricts breathing.
4. Have someone available to assist the rescue personnel to remove or separate the ends of the shaft if needed. If the rescue workers are unfamiliar with the machine, get expert help from the local dealer. This may save time and the victim rather than using trial and error.

Electrocution

1. Always assume that any downed power line is energized. Do not touch it until power company personnel arrive.

2. Do not touch an injured person who is in contact with the power line or you may become a secondary victim.

3. If a power line is on the victim, call the power company for help since they have trained personnel who can handle the situation. Never try to move the wire with a dry board since even old paint can conduct electricity through the board to the rescuer.
4. Administer first-aid immediately, as soon as it is safe and the victim is clear of the power source. Apply the ABC's of rescue and check for bleeding and broken bones. Treat for shock. The victim should be treated by a doctor as soon as possible.

Silo Gas Exposure

1. Silo rescues usually require the victims to be removed by litter, harness, body, or backboard. This requires a skilled team with the proper equipment and not something that should be attempted by untrained people. The victim can be helped by turning off the power to the silo so that the unloader may not be switched on accidentally.
2. The rescue team must have self-contained breathing apparatus (SCBA) and enough rope to lift the victim out of the tallest silo.

Manure Gas Poisoning

1. The gas present in and around liquid manure storage facilities is extremely toxic. Wearing a self-contained breathing apparatus (SCBA) is a must before attempting to rescue the victim. Back-up personnel with life lines are also necessary to provide assistance if needed.
2. Restore ventilation to facilities with below-floor manure storage facilities as rapidly as possible. Open windows and doors and activate ventilation systems or use smoke evacuation equipment.
3. Begin cardiopulmonary resuscitation (CPR) procedures immediately to revive the victim after the victim is moved to fresh air.

Heat Stroke or Heat Exhaustion

Know the symptoms:

Heat exhaustion. Symptoms include excessive fatigue and dizziness, and skin temperature normal but damp and clammy feeling.

***Treatment*:** Get victim to a cool spot and encourage victim to drink cool water and rest.

Heat stroke is serious. Symptoms include mental confusion, collapse, unconsciousness, and fever with dry mottled skin. A heat stroke victim will die quickly if not assisted immediately.

Treatment: Move victim to a cool place out of the sun and begin pouring water over victim and fan the victim to provide good air circulation until help arrives.

Poisoning

When any poisoning occurs always call the poison control center. Do not give the victim anything to drink unless directed to do so by the poison control center or indicated by product label. When taking the victim to the hospital always take the container with you or at least the product label. Products with poisonous vapors should be carried in the car trunk or in back of the pickup.

1. If poison is solid such as pills or other material, remove it from the victim's mouth with a clean cloth or finger.
2. If poison is gas, use an adequate respirator to protect yourself. Reduce the vapors by ventilating the area with fans or opening doors and windows. Move victim to fresh air only after the area is safe to do so.
3. If poison is corrosive to the skin, remove the clothing from the affected area and flush with clean water for at least 30 minutes.
4. If poison is in contact with eyes, flush eyes for 15 minutes with clean water.

Other Concerns

1. **Preserve tissue for reattachment**. It may be gross and horrible to think about, but retrieving a severed hand or finger or foot or other tissue is necessary since medical technology today has made reattachment a very real possibility, with minimal loss of use of the reattached tissue or limb. The severed part should be located, but do not attempt to clean it. **Place it in sterile gauze or cloth, then wrap it in a plastic bag and then place in an ice pack**. This will preserve it so that surgeons can attempt to reattach the part to the body. Never place a body part directly in contact with the ice as this will freeze tissue or cause the body part to shrivel.
2. Be active in your community in securing the equipment and trained personnel for farm rescue. Some communities do not have the proper response teams available. However, good planning, cooperation, wise use of available resources, and working closely with other municipalities could improve many existing services. Implement dealers are excellent resources for working on farm equipment.

Have First Aid Kits Available

Have a good first aid kit available preferably in each work location. By having several kits available you can prevent a minor injury from becoming life threatening. Check the kits often, preferably every 3 months, to make sure that supplies are still there. Kits can be purchased or assembled and placed in durable containers such as fishing tackle boxes. Examples of kits are given below.

A First Aid Kit for a Tractor or Combine

A basic kit used to treat small wounds, stop bleeding or support a fracture or sprain:

- Basic first aid manual
- two triangular bandages (36 inches) to make slings, control bleeding or splint fractures
- antiseptic spray (not pressurized can) to disinfect contaminated wounds (use before dressing)
- 12 large adhesive bandages for small cuts, puncture wounds, abrasions
- 4 safety pins to anchor triangular bandages
- 4 sterile 2x2 inch compress bandages to dress wounds and control bleeding
- 4 sterile 4x4 inch compress bandages to dress wounds and control bleeding
- roll of 2-inch tape to anchor dressing
- 6 pressurized 8x10 inch bandages to control bleeding and splint fractures
- scissors to cut clothing and bandages
- 2 rolls of elastic wrap to anchor dressings
- 5 clean plastic bags (one garbage, two kitchen, two bread-sized) to transport amputated tissue.

Specialty Kit for Poisoning

Prepare a specialty kit to use during pesticide application or to have available near areas where hazardous materials are stored.

- Emergency and poison-control center numbers
- Syrup of Ipecac (use only if advised by a doctor)
- Two one-quart containers of clean water
- Tongue depressors (to stir with or for seizures)
- Two small empty plastic jars with tight-fitting lids
- Can of evaporated milk (attach a can opener with a rubber band)
- Blanket for treatment of shock
- Plastic bandages and tape to cover exposed areas
- Disposable rubber gloves and goggles

Written by Tom Karsky, University of Idaho, and A. K. Jaussi, former graduate assistant, Washington State University. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Medical Emergencies Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Farm and Ranch Child Safety: Give Your Children Appropriate Tasks

Every year we see far too many injuries involving young children on farms and ranches. These injuries are particularly tragic in a family as well as in the community, especially since many of them could have been prevented.

Sometimes as parents, we give our youth tasks that may be beyond their skill level for their particular age. If we expect too much from our children, an injury can be the result. It may be something minor such as a cut finger, or it could have tragic results, such as a serious injury or death.

To prevent tragedy on a farm or ranch one should take into account developmental characteristics of children. By understanding traits of child development we can give children tasks appropriate to their skills and mental, physical, or emotional abilities.

This bulletin does not attempt to completely describe or detail child development ages or stages. However, it does describe typical development characteristics for different age groups.

The table on the following pages identifies growth stages of children, their development characteristics, causes of deaths and injuries, as well as developmentally appropriate work tasks. The information is based on research and experience, however, the work task suggestions for each age group represent the opinions of several child development and farm safety experts. Keep in mind each child is an individual and may not fit all the criteria within any age group.

Parents' Roles

The parents' job is to be good role models. They should show by example the proper methods of performing tasks on the farm or ranch. Parents need to provide the supervision needed for each growth stage. Parents need to be realistic about their child's ability. Since some children develop differently, tasks assigned must take this into account.

Few children under the age of 14 can anticipate or handle danger since they may not possess the cognitive ability to perceive and quickly react to a crisis. Parents need to anticipate potential dangers and make work decisions for their children. In some cases a child may not be able to handle the whole job but the job can be broken into several parts that he or she could handle safely.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Child development and appropriate work tasks.

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
Birth to 4 (infant/ toddler/ preschooler)	• Rapid growth, beginning motor skills development • Has balance problems, slow reaction time • Is curious, exploring • Is fascinated by movement • Has illogical or "magic" thinking • Is very energetic, releases tension by playing, even when exhausted • Is self-centered but interested in group activities	• Falling from tractors or heights, such as ladders • Ingesting poisons • Being kicked or trampled by animals • Drowning in ponds or manure pits • Being run over by tractor 	• Never have a child as an extra rider. • Use strong physical barriers such as locks and fences around ponds and manure pits. Lock up chemicals. • Store ladders out of sight and reach. • Provide a fenced-in play area way from farming activities • Provide maximum supervision at all times because of small children's poor coordination, high energy, and lack of fear. Keep children where you can hear and see them at all times.	• None. Children this age should not be exposed to work hazards.
Ages 5 to 9 (preschooler/ early elementary school age)	• Is learning to use small and large muscles—slow, steady growth stage • Has poor hand-eye coordination • Tries to master more complex skills • Operates with concrete facts, not capable of abstract ideas/thinking • Wishes to appear competent; seeks parent's OK • Wishes to take on tasks without adult supervision • Is discovering that parents make mistakes, are human • Rarely follows through on a task—not yet ready for responsibility	• Sliping and falling from tractors, trucks, or heights • Suffocating in grain • Being kicked or trampled by animals • Becoming entangled in augers, other machines 	• Set rules. • Discuss safe behavior with children. • Assign and closely supervise chores. • Monitor from a close distance; check every 10 to 15 minutes. • Talk openly about types of injuries and consequences. • Never assign intense, physical chores. They can lead to exhaustion.	• Tasks of short duration that do not require hand-eye coordination • Projects with hand tools, not power tools • Help with watering plants and feeding small animals, such as pets or orphaned baby animals

continued

(cont'd) Child development and appropriate work tasks.

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
Ages 10 to 13 (middle school age/ early teen)	• Is growing at a steady rate—approaching puberty; girls grow more quickly than boys • Small muscles are developing rapidly • Has same coordination as adults but lapses of awkwardness are common • Has greater physical and mental skills • Desires peer and social acceptance • Wishes to try new skills without constant adult supervision • Signs of independence emerging • Success important for self-concept	• Becoming entangled with machinery • Hearing loss from exposure to noisy machinery • Injuring head or spine in motorcycle and all-terrain vehicle accidents • Extra rider falling from tractor or other equipment 	• Potentially the most dangerous age because of constant risk taking and ease of distraction and clumsiness. Never mistake a child's size for ability to do work! • Enroll child in bike safety classes, if available. Always require helmets. • Set clear, consistent rules. Discuss consequences and rewards. • Provide specific education on farm hazard prevention. • Plan increased chores and responsibilities. • Start with low-risk tasks such as working with hand tools. Give more responsibility for follow-through with less supervision. • Monitor work frequently.	• Hand raking, digging • Limited power tool use (supervision from a distance and be able to stop child if necessary); hand tools better • Operating lawn mower (push mower, flat surface, under supervision) or garden tractor • Handling and assisting with animals
Ages 13 to 16 (adolescent/young teenagers)	• Is growing rapidly and changing physically; can be an uneasy time • Girls growing faster than boys • Has moved from concrete thinking to abstract; enjoys mental activity • Can find solutions to own problems but still need adult guidance	• Hearing loss from exposure to loud machinery • Head and spine injuries from motorcycle or all-terrain vehicle accidents • Machinery rollover/ roadway accident • Amputation due to PTO entanglement	• Judge size and age to measure maturity for tasks. • Be consistent with rules. • Provide education from peers with farm injuries. • Provide all-terrain vehicle training, protective gear.	• Still needs adult supervision but ready for more adult jobs such as equipment operation and maintenance • Gradually increase tasks as experience is gained

continued

(cont'd) Child development and appropriate work tasks.

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
Ages 13 to 16 (cont'd)	• Feels need to be accepted by peers • Resists adult authority • Feels immortal	     	• Become involved in 4-H and FFA safety projects.	• Manual handling of feed and feeding animals • Can operate a tractor over 20 PTO horsepower or connect/disconnect parts to or from tractor at ages 14 and 15* with proper training, ideally after the completion of a 10-hour tractor or machinery operation training program. • Can carry out routine machine operations after proper training, preferably after a 10-hour tractor or machinery operation training program, if available.*

*The Federal Fair Labor Standards Act requires that youth between ages 14 and 16 be required to take a tractor or machinery operation training program in order to be hired on non-family farms. In Oregon youth up to age 18 must complete the training before being hired on non-family farms.

(cont'd) Child development and appropriate work tasks.

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
Ages 16 to 18 (middle/ older teenage)	• Awkwardness overcome; mastery of small and large muscles basically complete • Knows abilities, moving further away from family and into community as independent person • Feels immortal • May act like child one day, adult the next • Rebellion, risk-taking, aggressiveness typical behaviors • Consistent treatment from adults important • Needs independence and identity • Has increased sense of adult responsibilities, thinking of future • May experiment with drugs or alcohol	• Same as adult tasks: respiratory illness, hearing loss, muscle/bone injuries, rollover from tractor, machinery entanglements • Additional risk if experimenting with or under the influence of drugs and/or alcohol 	• Provide rules regarding drugs and alcohol; open communication. • Reward for accepting adult responsibilities. • Serve as role model—teach younger children farm safety. • Parents may still have cause for concern with recklessness and risk-taking and may work side-by-side with young adult until absolutely ready.	• May be ready to work with tractors, self-propelled machinery, augers, elevators, and other farm equipment, but must earn this responsibility. Should be trained, educated, and supervised at regular intervals.

Information for this publication was adapted with permission from Penn State University, "Children and Safety on the Farm," ps6361, U.Ed.AGR97-25, June 1997. For further information please contact Pennsylvania Safe Kids Coalition, 2578 Interstate Drive, P.O. Box 68525, Harrisburg, PA 17106-8525, phone 717/657-1222, fax 717/657-3796.

Farm and Ranch Machinery Operation

The machinery operation "learning curve" could start with a small lawn tractor about age 13. Train youngsters in controlled situations where their actions can be closely observed. Watch to see how often or how easily they are distracted. The child can gradually move up to small tractors after training and supervision.

Although some children may begin operating some farm machinery by age 13 (under close supervision) age 15 may be a better age to begin to allow children to operate self-propelled equipment. Tractors operated by youngsters should be ROPS (Roll Over Protective Structure) equipped with the seat belt in use. Let the child get the "feel" of the tractor while doing minor jobs (such as towing empty wagons, raking, etc.) around the farmstead. Remember that today's equipment is bigger, faster, and more sophisticated than 20 years ago. Though easier to operate, today's equipment requires additional operating skills because of the speed and size.

Before a young trainee heads to the field, observe and test them verbally to see how they would handle various crisis situations. Choose large, open fields and flat terrain for the child's first experience with tillage or other field work. Keep a close distance and monitor their performance. Be prepared to stop the child to offer suggestions and explain precautions. However, don't "hover" and put too much pressure on the child!

Child Safety Is in Your Hands

Child safety is the responsibility of adults. No matter how careful they are taught, children lack the experience and knowledge to make all the right choices on their own.

While this is a brief discussion of child development and how it relates to farms and ranches, it should be used as a guide to consider when assigning tasks to children. Parents' expectations for their children often exceed the development of their children.

Remember that although a child is large in size, mentally and emotionally he or she is still a child and will react like a child. If the child is not comfortable with the task, they are generally not ready to perform the task.

As Marilyn Adams, founder of Farm Safety For Just Kids, once said, "We need to remember that children are not little adults. We cannot expect them to react like adults when situations occur."

Information for this publication was adapted with permission from Farm Safety Association, "On the Farm, Children Are at Constant Risk," Fact Sheet No. F-018, March 1995. For further information please contact the Farm Safety Association, Unit 22, 340 Woodlawn Road West, Guelph, Ontario, telephone 519/823-5600.

A Child Safety Checklist

The following list covers several of the most important threats to children's health and safety on the farm. It is by no means comprehensive, but can serve as a starting point toward making your farm or ranch a safer place. Discuss the list, point-by-point, with your children. See who can come up with additional safety hazards. This exercise will help boost overall family safety awareness.

- ❑ No riders! NO RIDERS! ***NO RIDERS!***
- ❑ Before moving equipment (especially when backing up), make sure that children are safe.
- ❑ When tractors and self-propelled machines are parked, brakes should be locked and keys removed from the ignition.
- ❑ Do NOT allow children to play with idle machinery.
- ❑ Leave hydraulic equipment (such as front end loaders, 3-point implements, combine heads, etc.) in the "down" position or use the attached hydraulic cylinder locks.
- ❑ Always leave a tractor PTO lever in the "neutral" position.
- ❑ Keep machinery in good repair. Pay particular attention to protective shielding, ROPS, and seat belts.
- ❑ Safety training must be completed before children are allowed to operate machinery. A degree of supervision will continue to be needed until teens become experienced operators.
- ❑ Farm ponds and manure storage structures should be surrounded by child-proof fencing.
- ❑ Place fixed ladders out of reach, or fit them with a special barrier. Store portable ladders away from danger areas.
- ❑ Practice good housekeeping. Do not leave items lying around to create a tripping hazard. Heavy objects should not be left leaning against walls or fences.
- ❑ Livestock facilities and operating machinery should be "off limits" to young children. Adult supervision is required at all times.
- ❑ Shield dangerous machinery components, electrical boxes, and wiring. Place these out of reach of small children or fit with locking devices.
- ❑ Store pesticides and other dangerous chemicals in locked facilities.
- ❑ Place warning decals on all grain bins, silos, wagons, and trucks.
- ❑ Do not start unloading grain from wagons or bins until you have double-checked that no one is inside.
- ❑ At regular intervals, set aside time for family safety instructions.

Written by Tom Karsky, University of Idaho. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Farm and Ranch Child Safety Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

How Does Safety Rate on Your Farm or Ranch?

Each year many people die or are seriously injured in farm and ranch accidents. Most of these accidents are preventable. This checklist can be a guideline for farm and ranch operations in evaluating each particular circumstance. Unsafe acts or conditions, faulty equipment, or human error often cause accidents that may result in injury, death, or property damage.

An inspection of your workplace will help prevent injuries by identifying hazards, recording them, and taking corrective action. You must be committed to correcting the hazards in some manner if you are to succeed in reducing accident potential.

Aspects of Workplace Inspection

Your inspection should not be taken lightly. You may need several family members or workers, or an outside set of eyes to see some hazards that you may pass every day. No work area can be 100 percent free of hazards. Include the questions *"Who, What, Where, When, and How"* for each area examined.

When to Inspect

Many locations on a farm or ranch can be inspected year round. The home buildings and other structures are examples of this. Machinery and equipment can best be inspected when gearing up for work in early spring, or in operation. Static inspection examines the machine itself (shields and guards, decals, wear and tear on parts), while an inspection during equipment operation looks at unsafe acts of the operator or hazards in the field.

How to Complete the Inspection

As you go through the various sections of the following inspection checklist, answer the questions or statements by checking "Yes" or "No". If you have answered "Yes", no action is required. If you have answered "No", then a hazard exists requiring corrective action. You should then determine a priority level for the hazard to indicate the urgency of the corrective action:

Priority level

You should determine a priority level for the hazard to indicate the urgency of the corrective action:

- **A** ***Major***
  Life-threatening or serious injury potential
- **B** ***Serious***
  Injury or property damage corrections in the short term
- **C** ***Minor***
  Long term action can correct the problem

Indicate a realistic target date to correct the hazard on the attached sheets. When a hazard has been corrected, check it off in the last column.

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington

Checklist	Yes	No	Priority level	Target date	Hazard corrected
HOME SAFETY Are some detectors installed in appropriate locations and operating properly? They should be tested periodically.					
Do you keep extra fuses on hand?					
Do small rugs have non-skid backings?					
Do you have a proper step stool or ladder for in-home use?					
Are there covers on electrical outlets where children play?					
Are all firearms safely stored and locked up according to new regulations?					
Do you post emergency numbers at all telephones?					
STAIRWAYS Are stairways clear of all hazards (shoes, toys, etc.)?					
Are there full-length handrails in good repair?					
Can stairways be well lighted?					
Are treads, risers, and carpeting in good condition?					
Are spills and wet surfaces cleaned up immediately?					
BATHROOMS Do you use non-skid mats/surfaces in bathtubs to prevent falls?					
Do you have a proper medicine cabinet?					
Are expired medicines disposed of properly?					
Do you keep electrical appliances away from sinks, tubs etc.?					
Do you have a night-light to prevent tripping?					
Is a ground fault circuit interrupter installed (GFCI) for bathroom circuits?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
KITCHEN					
Do you clean the stove's exhaust hood and duct frequently?					
Are cleaners, disinfectants, poisons, etc., secured out of reach of children and away from foods?					
Do you always use a step stool for climbing?					
Are utensils and knives neatly stored?					
Are handles of pots and pans always turned away from stove fronts?					
Are cracked or chipped dishes and glassware disposed of immediately?					
Are spills wiped up immediately?					
Are cupboard contents kept orderly to prevent falling objects?					
Is a fully charged fire extinguisher available?					
Are matches and lighters kept out of reach of children?					
ENTRANCES					
Is there adequate lighting at entrances?					
Are tripping hazards cleaned-up?					
Are steps well maintained?					
LIVING ROOMS/BEDROOMS					
Is furniture arranged to avoid bumping knees and shins?					
Are electrical cords kept away from carpets?					
Are fireplace screens used effectively?					
Are throw rugs avoided to prevent tripping hazards?					
Is furniture kept away from windows to prevent children from falling out?					
Are screens and windows secured to prevent children from falling?					
Have plans been made for a fire escape route from bedrooms?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
Living Rooms/Bedrooms (cont'd)					
Are lamps located near beds to prevent tripping in the dark?					
Are all chimneys checked for obstructions?					
BUILDING SAFETY					
Are buildings free of litter and debris?					
Are walkways, aisles and traffic areas clear of any obstructions?					
Is there adequate lighting in work and travel areas?					
Are stairs in good condition and equipped with handrails?					
Are stairs kept clear of obstacles on steps and landings?					
Are permanent ladders in good condition and inspected regularly?					
Have defects in concrete floors been repaired?					
Are low ceilings, beams, etc., marked clearly with signs or florescent materials to prevent bumping into them?					
Are stored materials properly stacked to prevent them from falling?					
Are protrusions such as nails removed from walls, railings, etc., to prevent contact?					
Are nails removed from used lumber before stacking?					
Do you wipe up spills immediately?					
Is there ample walking space between stored machines?					
Are keys removed from stored machines?					
Do large doors open smoothly?					
Are floor openings protected to prevent individuals from falling through?					
Do you keep your tractor and/or other fuel burning equipment in an outbuilding separate from the barn or other buildings?					
Do you avoid storing flammable liquids in barns or other structures?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
FIRE PREVENTION In hazardous areas, are NO SMOKING signs place in prominent locations?					
Are light bulbs and heat lamps protected with wire guards?					
Are roofs checked for leaks where hay or straw are stored? (Wet hay or straw could lead to spontaneous combustion.)					
Are lightning rods checked for proper installation and grounding?					
Do all telephones prominently display fire department numbers and farm location?					
Are appropriate fire extinguishers located strategically for easy access in case of fire?					
Are fire extinguishers inspected regularly?					
Do livestock buildings have at least two exits for animals?					
Are doors and gate latches easy to open?					
Are faulty wiring and electrical equipment repaired or replaced immediately?					
Does your family periodically review how to operate fire extinguishers and discuss emergency plans?					
Do you regularly dispose of garbage and other combustibles?					
Are flammable liquids properly stored away from any ignition sources?					
Do you take care not to damage concealed electrical wiring when drilling hole or driving nails into walls?					
Are matches and lighters stored safely and out of reach of children?					
Is there a water source that can be quickly and easily accessed in all kinds of weather for fire fighting?					
Are chimneys and heater pipes clean and in good condition?					
Do you obtain an outdoor burning permit where required?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
ELECTRICAL SAFETY Have you discussed the various types of insulation in buildings with your insurance company?					
Are power lines, poles and other electrical hardware coming into the farm in a state of repair?					
Have trees been trimmed away from conductors?					
Have you had overhead lines relocated underground to avoid contact with high vehicles in the farmyard?					
Do all outlets have three-pronged receptacles to provide proper grounding of electrical tools and appliances?					
Are there sufficient outlets to eliminate the continued use of extension cords?					
Are bare light bulbs protected from being hit by objects?					
Are outside outlets weatherproof and installed with ground fault circuit interrupters?					
Is your TV antenna located far enough from wires in case it falls during a storm?					
Do you have warning systems to indicate the failure of vital equipment?					
Do livestock ever act wary or refuse to drink?					
Do you unplug tools and equipment that are not being used?					
Do your tools and appliances carry UL listing?					
Are checks always made for underground wiring before digging?					
Is the correct sized fuse always used in circuits?					
Are proper fuses used in circuits where furnaces, dryers, ranges, air conditioners, etc. are connected?					
Are fuses and switches all labeled properly to prevent confusion in an emergency?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
WORKSHOP					
Are all electrical outlets in the shop properly grounded with ground fault circuit interrupters?					
Are floors kept dry at all times?					
Is personal protective equipment available (e.g., goggles, face shields, hard hats, etc.)?					
Is a stocked first-aid kit available?					
Are work areas debris-free and uncluttered?					
Is there adequate lighting to prevent working in shadows?					
Are suitable receptacles available for oily rags, used oil, etc.?					
Are there at least two exits available?					
Is adequate, well-organized storage available for tools and equipment?					
Are extension cords used only for temporary work?					
Are portable lights properly shielded to prevent breakage?					
Are portable tools unplugged when not in use?					
Are benches tidy and drawers kept shut?					
FIELDS, WOODLOTS, LANES DRIVES, AND YARDS					
Do you leave a sufficient turning area for machinery along ditches and embankments?					
Are washouts repaired and filled so vehicles will not be stuck?					
Do you trim low tree branches that could hit equipment?					
If underground utilities (e.g., gas lines, power lines, etc.) cross your farm, are they well marked?					
Do you keep your drive/lane in good condition, free of ruts and bumps or stones?					
Are all gates (yard and field) wide enough for machinery and trucks to enter and exit easily?					
Are workers made aware of overhead powerlines when moving tall equipment, ladders, etc.?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
FIELDS, WOODLOTS, LANES DRIVES, AND YARDS (cont'd)					
Are lanes and drives marked before winter snows to indicate ditches, etc. for snow removal?					
Are all obstacles that can be snow covered removed from yard and work areas before winter?					
Is equipment kept off steep slopes where stability can be uncertain?					
Are sidewalks and walkways in good repair?					
Are lawn and garden tools put away after use?					
Is the yard clear of rubbish, dead vegetation, waste, mislaid tools, etc.?					
Is there protection from the danger of uncovered water tanks, wells cisterns, etc.?					
Do you inspect trees after storms and in spring for broke limbs that could come down?					
Do you have an assigned play area for childre (e.g., a fenced area)?					
Do you kill or remove hazardous plants such as poison ivy?					
Do you check for nests of stinging insects and take appropriate action for their removal?					
Are clotheslines high enough for pedestrians to walk under?					
FARM TRACTOR SAFETY					
Do you read the operator's manual for you farm tractor, and follow the operating, maintenance and safety recommendations found therein?					
Before operating, do you walk around the tractor making a visual check for bystanders and other objects?					
Is the tractor equipped with a rollover protective structure (ROPS) and seatbelts?					
Do you always wear seatbelts with ROPS?					
Do you enforce the rule "NO RIDERS ON THE TRACTOR AT ANY TIME?"					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
FARM TRACTOR SAFETY (cont'd)					
Is there a SMV (slow moving vehicle) sign on the rear of the tractor or towed equipment for roadway travel?					
When towing equipment, do you use safety hitch pins and chains?					
Is there a first-aid kit mounted on the tractor?					
Is a fire extinguisher located on the tractor?					
When operating a tractor in buildings, do you open doors and windows or start ventilation fans?					
Are steps free of mud, tools or debris that could cause slips?					
Are keys removed from the tractor when not in use, to prevent theft or unauthorized people from using the equipment?					
Do you always avoid hazards such as ditches, steep hills and other areas where tractors can tip?					
When using front-end loaders, do you travel with the bucket low to avoid tipping sideways?					
Have all tractor operators on your farm received training on their equipment and reviewed the operator's manual?					
Do your tractor operators always do a proportional check, which includes a walk around the equipment to check lights, visibility, tires, brakes, etc?					
Is mounted equipment always lowered before the operator leaves the tractor?					
Are towed loads always hitched to the drawber, and never higher?					
When towing high loads, are clearances from overhead powerlines always checked?					
Is the exhaust system on each tractor in good condition and leak-free?					
If the tractor does not have a sound proof cab, does the operator always wear hearing protection?					
Are brakes adjusted regularly?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
PTO DRIVEN EQUIPMENT					
Do all PTO's have shields and guards in place?					
Is there a master shield in place where the PTO meets the tractor?					
Are shields on PTO's checked periodically to ensure that they rotate freely? (Check only with power off.)					
Before leaving the tractor seat, is the PTO always disengaged?					
When working with PTO driven equipment, is clothing close-fitting, long hair covered, and no laces, etc. exposed?					
Do you always avoid stepping over a PTO shaft?					
Are worn or defective parts replaced as soon as possible?					
GENERAL FARM MACHINERY					
Are key warning decals on machines readable?					
Are all shields and guards in place?					
Are all machines free of jagged metal or protrusions that could injure workers?					
Are hydraulic lines free of excessive wear or leaks? (Do not check hydraulic hoses for leaks with your hands, as fluid under pressure can be injected into human tissue. Use cardboard or wood to detect leaks.)					
Are defective and worn parts replaced as soon as possible on all machinery?					
Are tires inspected regularly and properly inflated?					
Are children and bystanders kept away from operating machinery?					
Is the power turned off before adjusting or servicing machinery?					
Are farm equipment manuals readily available to the operator?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
GENERAL FARM MACHINERY (cont'd)					
Is any equipment that is likely to be towed on roadways equipped with a slow moving vehicle sign, safety chains and safety hitch pin?					
Are SMV signs in good condition (clean and not faded)?					
Are moveable components properly blocked before repair or adjustments?					
Do you always observe the "NO RIDERS" rule on machines or drawbars?					
Are brakes adjusted regularly?					
PESTICIDES STORAGE					
Is your pesticide storage area used exclusively for the storage of pesticides?					
Is this storage area kept neat and orderly?					
Is the storage area vented to the outside?					
Is the storage area secure?					
Have you posted a chemical warning sign on all entrances to the storage area?					
Do you have adequate safety equipment (respirator, rubber gloves, boots, etc.)?					
Have you posted emergency telephone numbers?					
Is the storage area free of floor drains?					
When storing chemicals out-of-doors, do you keep them in a secure area?					
When chemicals are being stored in a vehicle, are they inaccessible to the public?					
Does your storage vehicle have a chemical warning sign prominently displayed?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
ANIMAL HANDLING FACILITIES					
Are steps and walkways roughened in facilities to prevent slips and falls?					
Are walkways and aisles kept free of debris, manure, feed, etc.?					
Are outside ramps, steps and entranceways protected from rain or spilled liquids that could freeze?					
Are animal drugs and barn chemicals kept in a secure area in original containers?					
Are pens, gates and fences in good condition, without protrusions?					
Are ventilation fans and vents operative and in good condition?					
Are heaters kept away from combustible materials?					
Do you use special care in handling animals with newborn young?					
Do you make animals aware of your approach so as not to frighten them?					
Do you have cattle dehorned?					
Do you forbid anyone to excite, tease or abuse animals?					
Are icy areas in feedlots sanded?					
Do you wear protective footwear and head protection when handling animals?					
Do you leave yourself an "out" when working in close quarters with animals?					
Are pets and animals immunized as required?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
LADDER SAFETY					
Are ladders inspected before each use? Are they replaced or repaired immediately if found faulty?					
Are wooden ladders coated with clear preservatives so that faults or cracks are visible?					
Are metal ladders free of weld cracks, missing rivets, etc?					
Are ropes on extension ladders in good condition?					
Are the feet of the ladder in good condition?					
Do you face the ladder when climbing up or down or when working from the ladder?					
Are areas around the top and bottom of the ladder clear of obstruction or debris?					
Are straight ladders placed at a four to one angle (the base set one foot out for every four feet up)?					
Are metal ladders avoided where electrical contact is possible from overhead wires?					
When using a ladder, does it extend at least three feet above the landing level?					
Have you replaced any missing or damaged rungs on the ladder?					
Are two people involved with moving or erecting long ladders?					
Do you store ladders where they cannot be damaged?					
Do you always put a ladder on firm footing or compacted soil?					
Is work with ladders avoided in windy or stormy conditions?					
When working from a ladder, do you always keep the trunk of your body centered within the ladder rails?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
SAFE LIFTING AND MATERIAL HANDLING					
Has everyone on your farm received instructions on safe lifting techniques?					
Is the "bend your knees" rule always followed?					
Is appropriate protective equipment worn when lifting and handling materials (steel-toed boots, gloves)?					
Are two people or mechanical means used to move heavy loads?					
Do you check for a clear pathway before lifting and moving objects?					
FIRST AID/EMERGENCY ACTION					
Do you maintain first-aid kits in the following locations:					
Home?					
Workshop?					
Tractors?					
Vehicles?					
Are first-aid kits periodically checked, replenished and updated?					
Has anyone on your farm or ranch received first-aid training in the last three years?					
Do you have a good first-aid manual for reference?					
Do all family members know how to shut off all machinery if someone is caught or pinned?					
Do you act on issued weather warning?					
Are you prepared for blizzards, floods, lightening, tornadoes, etc., should they strike?					
Do you know what to do for accidental poisonings?					
Are emergency telephone numbers posted by all telephones along with farm location and directions?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
SPECIAL STRUCTURES: SILOS, GRAIN BINS, ETC.					
Are entrances to silos and grain bins secured against entry by children?					
Are fixed ladders sound and in good condition?					
Are there safety cages around ladders on silos?					
Are warning signs posted to warn of silo gas or oxygen deficiency?					
Do you use appropriate self-contained breathing equipment when entering silos where gas may be present, or where an oxygen deficiency may exist?					
Are workers made aware of hazards of flowing grain entrapment and crusted grains?					
Can power be locked out so that unloading mechanisms cannot start by accident?					
Are all shields and guards in place on unloading mechanisms?					
Do you always avoid entering a manure pit for any reason?					
Are dust respirators used when handling moldy hay and grains, or when grain dust is present?					
Is your silo free of cracks and structural problems, corrosion, etc.?					
TRANSPORT VEHICLES: TRUCKS, ETC.					
Are keys removed from motorized equipment to prevent starting by children?					
When entering the roadway from your driveway, is there clear vision in both directions?					
Do you check your vehicle before going on highways (e.g., tires, lighting, visability, security of load, etc.)?					
Do you always wear seatbelts on the roadways?					
Are hoist-equipped trucks stored with boxes down when not in use?					

Checklist	Yes	No	Priority level	Target date	Hazard corrected
LAWN MOWER HAZARDS					
Does the person who uses the lawn mower always wear heavy shoes?					
Does the person who mows the lawn always pickup trash etc., first?					
Does the lawn mower have safety shields?					
Is a grass catcher used to help prevent objects from being "thrown" by the rotary mower?					
Do you always turn the lawn mower off (or disengage the blade) before crossing gravel drives or walkways?					
Do you always refill the lawn mower and other gas tanks outdoors?					
Is extra gasoline stored in a safety gas can?					
Do you always disconnect the spark plug wire before tipping the lawn mower up to do any servicing under the mower deck?					
Do you keep good mufflers on all gasoline-powered lawn mowers, leaf mulchers or snow throwers?					
Do you insist that everyone leave the area of lawn you are mowing?					
Do you work across the slope with a hand lawn mower?					
Do you mow up and down the slope with a riding mower?					
Do you always look behind you before backing up a riding mower?					
Do you make it a practice to never pull a hand mower toward yourself?					
Do you always wear hearing protection when operatin power lawn equipment?					

Written by Tom Karsky, University of Idaho. For more information about farm safety, please contact:

Tom Karsky, Extension Farm Safety Specialist, Department of Biological and Agricultural Engineering, University of Idaho, Moscow, ID 83844-0904, phone 208/885-7627, fax 208/885-7908, email (tkarsky@uidaho.edu).

Myron Shenk, Integrated Plant Protection Center, Oregon State University, 2040 Cordley Hall, Corvallis, OR 97331-2915, phone 541/737-6274, fax 541/737-3080, email (shenkm@bcc.orst.edu).

Bill Symons, Extension Safety Specialist, Biological Systems Engineering Department, Washington State University, 204 L. J. Smith Hall, Pullman, WA 99164-6120, phone 509/335-2902, fax 509/335-2722, email (symons@mail.wsu.edu).

This series is supported, in part, by funds provided by the Pacific Northwest Agricultural Safety and Health Center (PNASH), Department of Environmental Health, Box 357234, University of Washington, Seattle, Washington 98195-7234 (phone: 800/330-0827, email: pnash@u.washington.edu). PNASH is funded by CDC/NIOSH Award #U07/CCU012926-02.

Published December 1998 Farm and Ranch Safety Rating Farm Safety Series PNW 512

A Pacific Northwest Extension Publication
Idaho • Oregon • Washington