

# 12 - Identify Hazards and Prevent Accidents

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Injury and death rates in almost every survey published are higher from April to September for agricultural work. Obviously, these months coincide with grain sorghum production. What can be done on your farm to prevent the trauma and cost of severe injury or death? Top managers maintain timely crop practices and also place a consistent emphasis on reducing field, traffic and shop hazards in day-to-day management.

## Have a Plan to Reduce Hazards

One approach is to set long-range goals to eliminate hazards while finding safer ways to complete routine tasks. Assess the potential kinds of severe accidents and how frequently a person is exposed to that hazard. Develop a simple plan that you can follow to minimize these exposures. Serious concern should be given to the risks of road collision, tractor overturn and a person being run over or crushed by farm equipment. Consider all aspects of your farming operation to identify weaknesses, and then seek remedies.

If a person must work alone, make sure another person knows where the lone worker is and that regular contact is made. If a lone operator sees a hazardous situation, getting help to resolve it is essential. Everyone should be trained to contact the manager immediately about any serious safety concern.

## Field

A few field dangers cause many Arkansas fatalities. These are tractor overturns, equipment running over victims and crushing them, jump-starting tractors, hitching equipment or folding equipment for road travel.

Most tractors used for grain sorghum production have a Roll-Over Protective Structure (ROPS). It has been well documented that the risk of serious

Tractors	37%
All other agricultural machinery	17%
Farm trucks or other vehicles	11%
Animals	6%
All other fatalities	29%

injury from an overturn is essentially zero if the operator fastens his seat belt on a tractor equipped with ROPS! Practicing this safety habit may also reduce injury from a traffic collision. Operating a tractor, sprayer or combine too fast for conditions causes many overturns. Turning too short can cause an overturn. Misjudging your distance from an embankment can be serious, because the bank may crumble under the weight of the tractor or implement. FSA-1026, *Safe Tractor Operation*, available from your county Extension office or Extension web site [www.aragriculture.org/agengineering/farmsafety](http://www.aragriculture.org/agengineering/farmsafety), has more suggestions that may be useful for training farm help.

Whether calibrating a planter or sprayer or moving a combine, don't move equipment until you **see** that everyone is out of danger. Starting a tractor in gear from the starter terminal (jump-starting) is one of the two most common reasons Arkansans have been run over. Transmission interlocks prevent tractors from starting in gear, unless the safety is bypassed. A victim doesn't have enough time to jump away from a tractor left in gear before the engine builds hydraulic pressure and the tractor rolls over him.

Whenever noise prevents you from hearing someone, stop the engine and what you're doing and move where you can talk to clear up any confusion. Hand signals are easily misunderstood, unless both of you understand the meaning of a hand movement in advance. It takes good communication and

cooperation for two people to safely hitch heavy toolbars or towed implements. Make sure signals aren't confusing before moving the tractor to align the connection. Never stand between an implement and the tractor when hitching or unhitching. Quick hitches and well-constructed implement stands eliminate the need for a person between the implement and tractor.

Using a proper hitch support may prevent a dangerous hitching incident. If the hitch or lift pins do not align, movement may knock the support from under equipment; the toolbar or hitch may spring out of control or drop and crush someone's foot. Two severe accidents in 2002 may be instructive: One employee was killed trying to remove a pin when the hitch broke free and smashed his face. Another victim removed a latch pin and was crushed by a folding cultivator; the hydraulic cylinder didn't support the weight. If supports aren't sturdy, stable and at the proper height when disconnecting an implement, difficulty is likely when hitching the next time. Set the safety locks on the lift cylinders before working under a combine header. Never work under hydraulic lifts, raised truck beds, mowers or toolbars without **sturdy** supports.

Combine entanglements don't usually happen the first time it malfunctions. It's the fourth or fifth time, or later, when you're tired or irritated, in a hurry and your judgment lapses. Vibration and excessive noise dull an alert person's senses to hazards. Fatigue also slows your reaction, so take breaks for refreshment. Falls from combines, trucks, grain bins, etc., may be prevented with proper work platforms or sturdy ladders. Keep work areas neat and free of hose or electric cord loops, etc., which could pose trip hazards.

Professionals mount large implement tires with a protective cage. Mishaps while inflating tires can maim or kill. If you don't have equipment to handle tires safely, it is wiser to call a tire service company. Tires removed for repair or storage should be laid flat on the ground, leaned or secured against a post or placed in racks where they cannot fall.

Irrigation risers, discharge pipes and holes where water discharges may become hazards if they are not clearly visible. If field equipment hits a riser or washout, it could cause temporary loss of control in addition to damaging the equipment and/or the

riser. Placing some type of readily visible marker at each riser and controlling weeds so they don't hide the marker should alert drivers. Anchors and guy wires to power poles located in or near fields should also be permanently marked. Putting some type of solid protection around guy wires from power poles is a good idea to help avoid clipping or dislodging them with field equipment. Fill washouts and use some erosion control structure or method to prevent large washouts under discharge pipes.

Agricultural aviators have little reaction time to dodge hazards as they apply fertilizer and pesticides. Always warn the pilot of any risks that you're aware of to help him be better prepared. If a field has aerial hazards, consider whether it would be more appropriate to use ground equipment.

## Traffic and Road Transport

The National Highway Traffic Safety Association recently reported that approximately **40 percent more fatal crashes and fatalities occur in rural compared to urban areas**. Experience over the last four years in crop areas of Arkansas seems to reinforce national statistics. Changes like wider road shoulders, adding warning signs for curves with poor visibility, updating narrow bridges and, possibly, adding crossbars at railroad crossings should reduce rural traffic accidents. In some situations it may be possible to convince the town, county, state or railroad to maintain a clear right-of-way to obtain better traffic visibility.

Modern toolbars, combines and wide equipment typically require almost two normal traffic lanes. Motorists are often poor judges of the slow speed, width or weight of your implement, regardless of what you're transporting. Using an escort with flashing lights is probably the best way to alert a motorist. Being diligent to keep SMV signs, reflectors and taillights on and bright, cleaning them before entering a road, will improve their visibility during night and day.

Lock both of your brakes together and start onto a road slowly, even when traffic is heavy. Go slowly enough to manage the momentum of a tractor with a full grain cart, planter or toolbar, especially those that raise overhead. Dump all of the grain from your combine bin into a grain cart or truck prior to road travel to lower the center of gravity and gain control

in a sudden emergency. Always check traffic from both directions before making a turn off a road, especially a left turn, to prevent a collision and extensive damage, if not injury.

Railroad crossings are increasingly dangerous for growers on farm equipment. Some tractor engines and cabs may tune out the diesel train noise. In order to hear better, reduce the speed of the cab fan and turn off the radio as you approach a crossing. If you gear down well in advance, you can control the load, either to stop or to proceed when the track is clear. In some cases, either historical evidence and/or community effort may help to get the railroad to add crossing bars.

## General Precautions

Work can be done safely on equipment powered by electricity with a lock-out, tag-out approach. Anyone working with equipment powered by electricity should carry a lock with his personal key and tag. These are readily available from local electrical suppliers. Before starting work, always disconnect the power supply and lock the switch off. If you're interrupted by a phone call, or are not visible from the switchbox, no one else can reconnect the electricity. You can remove the lock from the switch lever after completing the work. Always use the heel of your left hand to throw lever switches and turn your face away as you move the control to minimize bad flash-fire burns.

A federal regulation intended for your personal safety prohibits anyone or any equipment from



**Figure 12-1. Proper method to safely bump or switch a disconnect lever on an electrical box.**

coming within 10 feet of an overhead power line. If field equipment or other traffic cannot maintain a 10-foot gap under the power line, request that your power supplier raise the power lines.

Diesel-powered generators, electric-powered pressure washers and hand tools (drill, angle grinder, etc.) and welders should all be adequately grounded. Grinders, drills and other electric tools bouncing around in a truck tool box can develop shorts. If the electric service entrance at the shop is grounded with an 8-foot ground rod (National Electric Code standard), all ground wire leads, including the extra grounding plug on power cords, should be connected to reduce the risk of electrocution when a short occurs. Use electric tools on dry soil, concrete, etc., to reduce the potential of a fatal current surge passing through your body.

Someone, maybe several people on your farm, should keep current on CPR rescue techniques. The local EMT, ambulance and fire department numbers should be posted by every permanent phone and programmed on speed dials. Each one on the farm should be prepared to call emergency rescue, should an accident occur.

Observe pesticide labels for proper use, mixing and disposal. Appropriate personal protective equipment is specified on the label. The label and the Material Safety Data Sheet (MSDS) should have specific inhalation, dermal, ingestion and emergency information. If a mishap occurs, use the label to help your physician and the poison center to start the proper treatment.

Fire extinguishers on tractors and combines may also protect your safety and equipment investment. Dry chemical all-purpose 3A-40B:C or 4A-80B:C extinguishers are good choices for tractors and combines. Once a fire extinguisher is 10 years old, it is generally wise to replace it unless it exceeds requirements in a thorough test.

## Irrigation

A qualified electrician should routinely check electrical circuits on irrigation pumps and center-pivot systems. Items to review are damaged wiring, proper grounding and adequate circuit protection, including immediate replacement of circuit boxes

damaged by electrical storms or circuit overheating. If a box has overheated or shorted, switching the disconnect may cause arcing and severe flash burns that may take months for merely partial recuperation. Always use the heel of your left hand to throw switch levers and turn your face away to minimize your hazard exposure as you move the control.

Be cautious when working around electrical circuits, especially when opening electric control boxes and around any circuits that are hot. Wasps commonly nest in and around electric control boxes and may also appear from electric motor shrouds, gear head covers, power unit platforms, irrigation well sheds and irrigation pipe openings. In order to prevent an injury, it may be wise to keep wasp and hornet spray handy when working on irrigation wells. Stings are not only painful; they can be fatal for one who is severely allergic to insect stings. Further injury can also occur if a wasp startles you and causes you to jump back. A sudden reaction that puts you in contact with an unguarded drive or an energized electric circuit may cause permanent disability.

Entanglements may occur with irrigation well power shafts, if safety shields aren't replaced. In general, power-take-off (PTO) hazards are respected, but more emphasis needs to be placed on shielding

unguarded power shafts on irrigation wells. Power shaft covers can be obtained from suppliers, including Menard Mfg. in DeWitt, AR (1-888-764-3130) to protect those doing maintenance around diesel, propane or electric power units. Power shafts for relifts or well pumps should be shielded; any concentric sleeves that don't spin free should be repaired or replaced.

If a power unit is not securely mounted and anchored, vibration may misalign the drive or break it loose from the supports. A loose power unit may cause a dangerous flailing power shaft or other hazards due to broken electrical wires, fuel lines or battery cables. Power units and battery mounts should be securely anchored to a substantial support platform and routinely checked for stability. A secure latch to keep the clutch of the power unit in neutral is a good safety device. This can help prevent accidentally bumping and engaging the clutch when working close to the power unit.

Typically, weather is very hot when irrigation is needed, and physical stresses may bring on heat stress. Anyone working in these conditions should drink plenty of fluids such as water and nutrient-replenishing drinks. Breaks and rest periods should be taken as needed to avoid heat stress, fatigue and exhaustion. Fatigue and exhaustion, of themselves, are health hazards, but they may also contribute to poor judgment, causing other accidents and injuries.

Reservoirs and open irrigation distribution ditches may present concerns. Normally, a clear warning on a sign about the water hazard, unusual currents around culverts, etc., and potential bank washouts will caution outdoorsmen or others who may enter. Evaluate a location with respect to residences or public access to determine whether it may attract youngsters. Gates and fencing may be used around accessible areas to prevent ATV riders or children from getting into danger. Posting no trespassing signs or a drowning warning is primarily useful only for adults.

## Grain Drying

The primary grain-handling hazard is entanglement, but the potential for both suffocation under flowing grain and electrocution should also be reviewed. Certainly, all auger covers should be in place **every** time the power is engaged. In addition,



**Figure 12-2. Install shields to protect anyone working around well power shafts.**

don't reach across belt drives or power shafts; take the time needed to walk around your tractor or power unit. Fans and drives should be shielded to prevent anyone from getting caught. Children shouldn't be around grain handling facilities; fencing the area may be a practical choice.

A qualified electrician should routinely check electric circuits to confirm proper grounding and adequate circuit protection, including making immediate repairs of faulty wiring, conduits or control panels. Disconnect electric power and use the lock-out, tag-out procedure every time before beginning work around an auger, fan, motor or powered component. Lock out (Off) all power to the facility when it is not being used. Before tilting a truck bed, moving an auger or tall equipment, check for overhead power lines; too many times an auger is raised or pulled into a bare overhead wire. When grain bins are built or facilities are remodeled, power lines should be routed well away from any work areas so accidental contact with wires isn't possible.

When entering a grain bin, wear a NIOSH-approved toxic dust respirator for molds and dust to prevent a reaction called farmer's lung or toxic organic dust syndrome. Turn off all unloading equipment and lock out switches with a padlock before entering a bin so that someone doesn't unwittingly engage the power. This applies to all loading auger, sweep auger, stirring auger and unloading auger circuits. Don't enter a grain bin without a safety harness and tether manned by at least one adult outside the bin whose sole responsibility is aiding the entrant. Crusted grain has been a factor in a number of deaths to growers. Spoiled or caked soybeans, corn, rice or grain sorghum may bridge over a cavity and cave in onto a man if the crust suddenly fractures. If some grain is removed from a bin with a crusted surface, the undermined surface may suddenly collapse under your foot, releasing an avalanche of grain. More than 500 pounds of pull are required to move a man who is covered with grain to his shoulders. If you're covered, you can't get yourself out and you're likely to suffocate if no one is watching. More details are included in FSA-1010, *Suffocation Hazards in Grain Bins*, available from the county Extension office or on the web site listed previously.

## OSHA

Only farms with 11 or more employees are required to meet all OSHA labor regulations. All growers who employ a worker, however, are to comply with these standards:

- 1) Roll-over protective structure (ROPS)
- 2) Slow moving vehicle emblem (SMV)
- 3) Agricultural machinery guarding (of moving parts, i.e., PTOs, combine safety shields, auger inlet covers and other moving machinery guards)
- 4) Anhydrous ammonia standards
- 5) Temporary labor camps standards
- 6) Pulpwood logging standards
- 7) Hazard communication (right to know). If you are an employer and store farm diesel fuel, pesticides, etc., then labels, MSDS information, training and a written Hazard Communication Program are required.
- 8) Worker protection standards for handling and applying pesticides.

If your farm is under OSHA jurisdiction, OSHA requires reporting an accident within 8 hours. They define a reportable incident as hospitalization of three or more employees in one accident or a death of one or more employees. A Washington, D.C., phone number, 1-800-321-6742, is available 24 hours a day. You can report to the federal OSHA office in Little Rock during working hours at 501-324-6291, extension 235.

If an OSHA officer requests admittance to a workplace, an employer may deny it. The officer can, however, obtain a search warrant. The inspection should include only the immediate accident scene. Inspections may result in setting a penalty or formal warnings, with penalties enforced later (often 30 days), if the hazard isn't remedied. Inspectors can ask that employees be removed from areas of imminent danger. An owner can appeal to the federal OSHA office in Little Rock, phone 501-324-6291, extension 235.

Other considerations that may be important:

- 1) When is a CDL operator's license required?
- 2) What training should be provided for all employees and others? Training at the time of employment, as tasks are assigned, and at minimum, every year, instructs every employee on farm hazards and on safe operation. Keeping signed records is the best way to document training and record your progress removing farm hazards, should a major injury or death occur on your farm.
- 3) Are 14-15 year-olds employed? Training for hazardous machinery operation is specified and work criteria apply to those under 18 who are employed in agriculture.
- 4) Are your insurance policy liability limits and deductibles appropriate for your present farm?
- 5) Have you considered whether workmen's compensation is feasible?
- 6) Are employment procedures for non-citizens applicable?

## Summary

**These suggestions are a start to help you manage hazards and find ways to avoid them. These hazards are only highlights. Review your techniques and farm work sites in order to reduce potential hazards.**

A grower's leadership is the key to influencing employees and others on the farm. Employees must know that working safely is expected, for their welfare, as well as that of their employer. During the non-crop season, it is wise to make a careful hazard audit. Review the previous season's activities and field records to bring to mind hazards or incidents, especially considering situations when someone narrowly avoided serious injury. Evaluate equipment for proper repair and that shields and guards are in good condition and in place. Making changes may save someone's life the next season.

In most situations, **equipment isn't the underlying cause of an accident.** A single thoughtless reaction can make you a victim. Never get in a hurry. Plan ahead to ensure there is enough time to do the job properly and safely.

### Contacts that May Prove Helpful

Emergency Rescue	911 or _____
Poisoning	1-800-222-1222
Family Physician	_____
Local Electric Power Supplier	_____
County Sheriff	_____
Local Implement Dealer (assist with extrication)	_____
Local Implement Dealer (assist with extrication)	_____
Arkansas State Highway and Transportation Dept. (Police: Oversize and over-weight permits, etc.)	501-569-2381
Commercial Driver's License (CDL) info.	501-682-1400
State Fire Marshal, Arkansas State Police	501-618-8624 (Fuel storage questions)
Arkansas State Plant Board	501-225-1598
Arkansas Department of Environmental Quality	501-372-0688
Arkansas Department of Labor-Wage and Hour	501-682- 4501
OSHA Consultation	501-682- 4523
LPG (Liquefied Petroleum Gas) Board	501-324-9228