



Promoting Agricultural Health & Safety

Evaluate equipment for dangers

The most serious injuries and fatalities on the farm involve machinery and equipment. In 1993, nearly half of 51 Iowa farm deaths resulted from working with or around agricultural equipment.

Farm operators depend on powerful equipment to effectively handle commodities. Although some injuries occur in recognized danger areas, such as around power take-offs, many others occur in areas where hazards are not readily apparent.

For example, more Iowans were injured while operating skid steer loaders than balers in 1992-1993. Farm operators who work with balers know the dangers of getting caught in the windrow pick-up area and take appropriate precautions, while operators of skid steer loaders often fail to recognize the hazard of being crushed by the hydraulic loader arm. Unlike seasonal equipment, loaders are used frequently in some operations, which increases exposure to danger. Side screens on an operator's cab can help prevent this hazard.

The key is to recognize hazards while working or living on a farm. Then you can avoid dangerous situations or at least minimize your exposure to them.

This publication deals with danger points on agricultural equipment, those areas which can entangle, pinch, crush, or shear clothing and limbs. Possible danger points could be the belt, chain, or gear drives on many types of equipment. Rotary or auger intake areas on grain handling equipment, grinder mixers and grain heads also are

dangerous. Consider feed rolls, gathering chains and similar equipment used to pull crops into a machine as areas where extra caution is required. A slow-moving hydraulic arm can be as hazardous as a rapidly rotating power take-off shaft.

Recognize the dangers

The first step to avoiding danger is to recognize that hazards exist. Carefully read the safety section in operator manuals. Identify specific hazards associated with equipment you frequently use.

Then consider how you use equipment. Are you using it for tasks it was meant to perform? Are you following all safety precautions recommended by the manufacturer?

Most machinery accidents result from human error. The operator either forgot something, took a shortcut, ignored a warning, wasn't paying close attention, or failed to follow safety rules. Be familiar with the operator manual so you know the limitations of your equipment and can follow safety measures automatically.

Carefully evaluate the operation of each implement for safety before starting work. For example, a skid steer loader bucket is a poor choice for a human lift because the bucket is designed to dump its contents. It has no guard rails and no way to prevent the bucket from dropping if hydraulic power fails.

Check equipment guards

Equipment guards cannot eliminate all

Farm machinery safety

How much do you know ?

Test your skill with this quick quiz.

1. Which equipment is involved in more agricultural injuries?
a) balers
b) skid steer loaders
2. Guards on augers eliminate all auger entanglement hazards. True or false?
3. An alert operator of a skid steer loader can get out from under the hydraulic arm if the bucket accidentally falls. True or false?
4. Which is a hazardous situation:
a) spilled grain around auger intake area
b) a rotating power take-off shaft
c) children in the work area
d) all of the above

See answers on back.

IOWA STATE UNIVERSITY

University Extension

Ames, Iowa

Pm-1265c | Reprint | September 1994

accidents. The best auger intake shield won't work if it's not in place, or if the operator gets too close to the auger.

Check guards on all equipment as part of your routine maintenance schedule. During seasons when equipment is used heavily, check guards more often.

It may be possible to retrofit older equipment with shields. Check with your local implement dealer or the manufacturer to order specific retrofit parts.

Recognize secondary hazards

Many accident victims recognize hazardous situations, but they misjudge the seriousness of the hazard because of secondary factors.

For example, spilled grain or debris in an unloading area could cause you to slip and fall into the intake auger. Icy, muddy or manure-covered surfaces make the work area slick and increase the risk of injury. Bystanders or children in the work area can distract the operator, or limit operator vision.

You can't eliminate the hazard of working around grain augers, but you can reduce the hazard. Remove or eliminate secondary factors that are under your control. Keep the work area clean and uncluttered. Control access and shut down operations when others enter the work area.

Consider human factors

Farm operators can overestimate their ability to stop or avoid a dangerous situation. This is common when operators work around powerful

equipment every day and become comfortable with their ability to control the machinery.

However, operators are limited by their reaction time. The human reaction time to a stimulus commonly ranges from one-fourth to three-fourths of a second. Time varies by individual, and with age and physical condition. Human reaction time is not quick enough to avoid accidents with machinery.

Gravity also is faster than human reaction. For example, it is very dangerous to reach underneath the hydraulic loader arm of a skid steer loader. If the hydraulic line breaks, gravity could pull the loader bucket to the ground at a rate of about 9 feet in three-fourths of a second, and crush the extended arm of the operator.

Manufacturers have built safeguards into equipment but all hazards cannot be removed. Take a realistic approach to equipment safety and think about these principles for the operation of all machinery.

- Be aware of the dangers. Read the operator manuals and think about how you use the equipment.
- Regularly repair and replace protective guards or shields on all implements.
- Look for and remove secondary hazards, such as spilled grain or debris.
- Recognize the limitations of you and your equipment.

Prepared by Mark Hanna, extension agricultural engineer, Charles V. Schwab, extension safety specialist; and Laura Miller, extension communications. Design by Valerie King.

For more information

■ *Shielding Agricultural Equipment*, Catalog #699.41-0016, National Safety Council, 1121 Spring Lake Dr., Itasca, Illinois 60143-3201. Fee for publication.

■ *Beware of Machine Hazards*, OSHA-2281, Occupational Safety and Health Administration, OSHA Publications Office, 200 Constitution Ave. N.W., Room N-3101, Washington, D.C. 20210.

■ *Fundamentals of Machine Operations: Agricultural Machinery Safety*, available from John Deere Service Publications, Dept. F, John Deere Road, Moline, Illinois 61265. Fee for publication.

■ Other Safe Farm publications, including *Reduce Risks Around Big Round Bales*, Pm-1518g, and *Harvest Safety Yields Big Dividends*, Pm-1265h.

... and justice for all

The Iowa Cooperative Extension Service's programs and policies are consistent with pertinent federal and state laws and regulations on nondiscrimination regarding race, color, national origin, religion, sex, age and disability.

Cooperative Extension Service, Iowa State University of Science and Technology and the United States Department of Agriculture cooperating. Robert M. Anderson, Jr., director, Ames, Iowa. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

Farm machinery safety

What can you do?

A few simple actions can reduce your risk of danger around farm machinery.

- Collect operator manuals for all farm equipment and place in a central location. Read the safety section in each manual.
- Evaluate how you anticipate using each implement and identify potential safety hazards not mentioned in the manual.
- Check condition of intake guards and shields on grain augers and other implements. Order and install retrofit guards for older equipment.
- Remove debris from grain unloading areas. Shut down equipment when other people enter the area.

Answers to quiz: 1-b; 2-False; 3-False; 4-d



Safe Farm promotes health and safety in agriculture. It is funded by the National Institute for Occupational Safety & Health, Iowa State University, and a network of groups that serve Iowa farm workers and their families.

File: Health and Safety 1
NIOSH #UO5/CCU706051-03



Printed on recycled paper with soy ink