Safe Farm
Promoting Agricultural Health & Safety

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Reduce Risks Around Big Round Bales[1]

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Equipment that produces large round bales provides an efficient and economical way to harvest hay. However, it also poses unique safety problems for the operator.

Large round bales often weigh 1,500-2,000 lb., the same as a small car. Sometimes hay is harvested at wetter than optimum moisture content, which causes the hay to clump and the baler to clog. It's also harvested during uncomfortably hot conditions, which causes operator fatigue and frustration. Add to these factors the human tendency to misjudge reaction time around aggressive equipment. The result is a potentially dangerous situation often overlooked by many farm operators.

According to the Iowa Department of Public Health, four Iowa tractor operators were fatally crushed in a three-year period when a bale rolled down raised front-end loader arms. Other injuries are reported in which the weight of the bale causes the tractor to overturn. Injuries also occur when the operator gets caught in the pick-up mechanism while trying to unplug the machine or hand-feed twine or hay into the baler.

This publication will review common hazards posed by the harvest and handling of large round bales, and operational and maintenance procedures that can reduce those hazards.

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LARGE ROUND BALE HAZARDS

Large round bales are bulky as well as heavy. Bales are compact and dense, and usually reach a diameter of 5 to 6 feet. They are designed to repel rain and prevent spoilage, however, they also easily roll down inclines or off raised loaders.

Due to their large size and weight, round bales affect the stability of equipment used to handle them. Check the baler owner's manual for charts regarding the size of the tractor and loader required to safely lift and transport large round bales. Always adjust the tractor wheel tread to the suggested setting to assure that the tractor can maintain balance and avoid rollover.

Always use a grapple hook with a front-end loader to transport large round bales. A grapple hook will prevent the bale from rolling back onto the loader arms. Use a tractor with a cab or a four-post rollover protective structure for additional security.

A rear-mounted loading spike is ideal because it eliminates the danger of roll-back and it does not block the operator's forward vision. Insert the spike into the center of the bale for maximum control.

Never try to stop a rolling bale, even with a tractor. A bale gains momentum as it moves. You wouldn't try to stop a car free-wheeling down a hill, likewise, don't

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try to stop a large round bale. During baling, drive on a contour so that released bales do not roll down a slope.

When transporting large round bales, try to keep the bale on the up-slope side of the tractor. This will provide the best stability for the tractor to prevent an overturn. This may mean that you put the transmission in reverse and back up a hill when using a rear-mounted spike, and that you back down a hill when using a front-end loader. Avoid driving across a slope while transporting a large round bale.

Remember low and slow when moving large round bales. Drive slowly to avoid sudden movements and turns, which are exaggerated by a heavy load and can cause the tractor to tip. Keep the bale low to maintain balance. Traveling over rough ground, stumps, or ruts can cause a tractor carrying a large round bale to overturn.

BALER HAZARDS

Implements that produce large round bales save labor because they require only one operator. However, they pose many of the same hazards as conventional square balers that required a crew of workers. On both balers, the intake area is the most dangerous place because operators fail to perceive the speed and power of the machine.

For example, a baler traveling at an average speed of 3 miles per hour pulls in crops at a rate of 4.4 feet per second. This is faster than an operator can react if he or she is trying to adjust or unclog the area while the equipment is running. In the .5 second it would take to let go of loose hay or pull a sleeve from a moving pick-up tine, an operator ┌s hand and arm can be pulled into the machine. The power take-off unit and moving belts on the baler pose similar dangers for the operator.

Always disengage the power take-off and shut off the tractor engine before getting off the tractor. If a problem must be diagnosed while equipment is running, check it from a distance. Be sure you have stable footing and that you do not get close to moving belts and other parts.

Never feed twine by hand into the baler. Make sure the twine is properly threaded and the twine arm is adjusted and in good working condition.

Maintain proper settings and speed. Harvest is a manufacturing process. To avoid problems, set the baler pick-up at the manufacturer's suggested height and operate the power take-off at the suggested speed. Travel at a speed at which the machine can handle the width and size of the windrow to avoid clogging and other equipment problems.

Replace broken or worn parts. A baler with broken or missing pick-up tines, loose belts, and other damaged parts will not feed material properly into the bale chamber. Always lubricate sprockets and chains when the machine is turned off. Make sure guards and shields are in place, and that the hydraulic system is in working order.

Always lock and block the rear gate if you must be underneath it. This will prevent the gate from falling on top of you if the hydraulic system fails. Make sure the rear area is clear before discharging a bale.

Be prepared for fire. Hot, dry weather conditions, friction from belts and chains, and readily combustible hay can lead to fire. Carry a Class ABC fire extinguisher on your tractor.

Poor weather conditions cause many of the problems experienced during production and transportation of large round bales. However, some things are within your control. A professional attitude, well-maintained equipment, and use of proper operating procedures can reduce your exposure to many of the risks associated with large round bales.

BIG BALE SAFETY

How Much Do You Know?

1. A rolling bale has the same momentum as a subcompact car traveling at the same speed. True or false?

2. When you make large round bales on an incline, which way should you drive in relation to the slope?
   a. across the slope
   b. up the slope
   c. down the slope

3. When you transport large round bales on an incline, where should you keep the bale?
   a. on the uphill side of the tractor
   b. on the downhill side of the tractor
   c. neither; you should drive across the slope

4. How fast can a baler moving at 4 miles per hour pull in hay?
   a. 52 inches per second

b. 24 inches per second
c. 12 inches per second

5. When carrying large round bales on a loader, always keep the bucket up to not block your vision. True or false?

See answers at the end of "What Can You Do?".

What Can You Do?

Large round bales require special care in handling. You can be safe around this hazard by following these tips:

- Obtain and use a grapple hook if a front-end loader will be used for bale transport.
- For sloping fields, plan to make windrows parallel to contours.
- Plan a safe route out of the field when you transport bales. Avoid rough terrain.
- Always turn off the engine before you get off the tractor.
- Replace broken or worn pick-up tines and belts.
- Keep the twine feeder in good repair.

Answers to quiz:

1-True; 2-a; 3-a; 4-a; 5-False

FOR MORE INFORMATION

For more information about large round bale safety, contact the National Safety Council (NSC) for *Hay and Forage Harvest Safety*, Catalog #69941-0027. You can write the NSC at 444 N. Michigan Avenue, Chicago, Illinois 60611. Cost is about $1.

Another good source is *Hay and Forage Harvesting*, Deere FM014, available from John Deere Service Publications, Dept. F, John Deere Road, Moline, Illinois 61265. Cost is about $25-$30.