

## ROUND BALER SAFETY

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**August 17, 1994.** A 68-year-old farmer died of injuries he sustained when he became trapped in the rollers of a large round hay baler. A motorist investigating the incident found the tractor engine running at full throttle and the power take-off (PTO) engaged, but the baler was not operating. The motorist noticed that the farmer had been pulled into the front of the baler and was trapped between two steel rollers above the baler pickup mechanism. *Source: Minnesota FACE*

Except for some small farm and ranch operations, small 40-to-60-pound square bales are being replaced by large round bales that can weigh more than 1,500 pounds. This shift is due to the increased number of round balers, transport equipment, and time and labor savings. In fact, with today's tractors and machinery, one person can cut, bale, transport, stack, and feed hay without the need for additional labor.

Despite the relative ease of producing hay, round balers are responsible for numerous serious injuries and deaths to farmers. Round balers require more horsepower to operate, and present more wrap, pinch, and shear hazards, when compared to conventional square balers. Inexperienced operators working alone often overlook potential hazards or take unnecessary risks without proper training. The physical nature of round bales is also responsible for many injuries. Round bales weighing more than 1,500 pounds must be handled carefully and with proper equipment.

### BALER PREPARATION

Round baler safety depends in part on how well the baler is prepared for use before the season starts. Comprehensive, pre-season maintenance can minimize downtime in the field, reduce the potential for injuries during field maintenance, and improve

harvest efficiency. As part of a pre-season checkup, you should:

- Clean the baler thoroughly, removing crop residues and other debris.
- Lubricate all parts according to the maintenance guide.
- Check for missing, loose, and damaged pickup mechanism teeth.
- Replace all missing guards and shields.
- Inspect all belts and chains for wear or damage. Adjust belt tension to prevent slippage.
- Check hydraulic hoses for evidence of leaks.
- Test the twine feeding and cutting mechanism for proper operation.
- Check the slip clutch, roll scraper, and rear gate latch for proper function.
- Check all lights, replace damaged reflectors, and clean or replace the slow-moving vehicle emblem.
- Make sure tires are in good condition, especially if you will be pulling the baler on a public roadway.
- Affix a new 10-pound ABC fire extinguisher to the baler.

Pre-season preparation will also allow necessary lead-time to get needed replacement parts. This is also a good time to train new employees on baler operation, field maintenance, and safety.

### BALER OPERATION

#### Ready ...

The hay has been cut and is now curing. This is a good time to double-check and mark the location of hidden stumps, holes, ditches, abandoned equipment, and any other obstructions in the field. Be sure to inform workers who are unfamiliar with the layout of the pasture.

Make sure the hay is sufficiently cured to 20 percent moisture or less to prevent excessive plugging of hay as it enters the pickup mechanism. The less time you spend off the tractor unplugging the baler, the safer you will be.

### Set ...

Adjust the pickup mechanism for adequate ground clearance. If the pickup mechanism teeth are set too low and contact the ground, rocks, soil, and other debris can be thrown toward the operator. Setting the pickup mechanism too high will leave hay on the ground.

Make sure chains are properly lubed and hydraulic hoses are secured in the correct ports. Engage the PTO and look for signs of any trouble. Open and close the baler gate, and move the twine feeding arm to ensure all tractor control levers work adequately.

### Go!

When starting a bale, drive slowly until it is obvious the bale has started forming. Starting off too fast will increase the likelihood of plugging the pickup mechanism. Once a bale has started, drive at a consistent speed. Ground speed should be adjusted with crop conditions and the size of the windrow. Watch for signs that the pickup teeth are contacting the ground or that hay is being left on the ground.

Once a bale is formed, slowly back the baler to a suitable unloading point. Don't unload a bale on a steep slope where the bale is likely to roll downhill. Also, be careful not to back into holes or get too close to ditches.

Listen for signs of excessive baler clatter. This could signal that the drive chain(s) and sprockets need to be lubricated. Operating the baler with a dry chain will cause the chain to overheat and break, and could start a fire.

If the baler becomes plugged with hay, immediately turn off the PTO, put the tractor in neutral, and set the parking brake. Wait until all machine motion has stopped before approaching the baler. Never try to clean, unplug, or adjust a baler while it is turning. Also, never try to feed hay into a baler by hand—the hay will be taken in faster than you can release it.

## **REMOVING BALES FROM THE FIELD**

Large round bales should only be handled by appropriately sized tractors and properly designed lifting equipment. Set tractor wheels at maximum width to increase stability. Front-end attachments such as hay forks, spears, grapples, and rear lift equipment should be in good working condition and capable of moving heavy loads.

Never move round bales in a front-end loader bucket. Numerous cases, like the one discussed below, occur when an unstable bale rolls off the front-end loader, down the front-end loader arms, and onto the tractor operator.

Tractors used to handle round bales should be fitted with roll-over protective structures (ROPS). ROPS will help cushion the blow should a bale roll down the loader arms.

**February 28, 1995.** A 70-year-old, part-time farmer died when he was crushed by a large round bale he had been transporting. The farmer used a tractor and front-end loader bucket to move a hay bale into a feeding lot. The tractor was not equipped with a general purpose cab or roll-over protection structure. The loader bucket was not equipped with a large round bale clamp or bale fork specifically designed to secure the bale. The farmer tied the bale into the bucket with a 5/8-inch-diameter rope. As he raised the loader bucket and backed up a slight incline, the rear wheels began to spin. The rope broke and the bale tumbled down the loader arms, pinning the farmer in the driver's seat. *Source: Minnesota FACE report.*

Never travel with bales in the raised position. This raises the tractor's center of gravity, making it more likely to turn over on uneven terrain, or during sudden stops and turns. Instead, lower the bale just above ground level and use counterweights or carry an additional bale on the opposite end of the tractor to stabilize the load. Watch out for obstructions, other hay bales, holes, and ditches that could upset your load.

## **LOADING BALES ONTO TRAILERS**

Round bales are often loaded onto trailers for transport to a central stacking area or to another field. To ensure your safety as well as the safety of

other motorists, make sure the trailer is capable of handling the load. Park the trailer on level ground, away from trees, overhead power lines, and ditches. Remember to set the parking brake on the vehicle or tractor pulling the trailer.

Approach the trailer with the bale lowered just above the ground. When you reach the trailer, raise the bale to the appropriate height. Be careful when maneuvering the tractor with the raised bale, especially if the ground is uneven or wet. Avoid sudden stops, starts or changes of direction. Be very cautious, and travel at low speed when carrying a bale.

## TRANSPORT

Heavy-duty vehicles and trailers often transport round bales on public highways. Bales are sometimes positioned two-wide down the length of a trailer, with an additional row of hay stacked along the top-center. This load can extend 12 feet wide and reach more than 15 feet high, depending on the height of the trailer. These loads must be secured by chains or safety straps to keep the bales from rolling off into oncoming traffic.

The Texas Transportation Code has established the maximum allowable vehicle width on public highways to be 102 inches (or 8'6"). However, the Texas Department of Transportation issues an annual permit to transport bales of hay up to 12 feet in width. To apply for a permit, call the Texas Department of Transportation at (800) 299-1700 or by visiting their web site at [www.dot.state.tx.us](http://www.dot.state.tx.us).

All trailers used to transport round bales should be equipped with trailer brakes. Otherwise, the pulling vehicle's steering, brake system and overall drivability will be limited by the heavy weight and momentum of the loaded trailer. Safety chains should be attached from the trailer to the back of the vehicle to prevent the trailer from veering into oncoming traffic if the trailer comes detached from the vehicle.

Vehicle drivers should allow extra time for braking and turning, and shift to a low gear when traveling down hills. This will use the vehicle's transmission to control downhill speed. Never coast down hills when pulling heavy loads; this will increase speed.

Use an escort on narrow roads with bridges and low-hanging electric lines. This will warn oncoming motorists of a wide load. Only move hay during the day, when visibility is greatest.

When pulling the trailer with a tractor, mount a SMV emblem on the back of the trailer near the center of the hay stack to warn motorists of your slow speed. Many accidents occur as motorists traveling at high speed approach a slow-moving vehicle with little time to react.

Texas traffic law requires that farm tractors with a maximum speed of 25 miles per hour be equipped with a slow-moving vehicle (SMV) emblem on the rear of the tractor. When towing a trailer or other equipment that blocks the SMV emblem, another SMV emblem must be attached at the rear of the towed load.

**Never allow anyone to ride on top of the hay stack when pulling a load on a highway.**

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