

## University of Missouri Extension

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# Large Round Bales: Management

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The large round bale, as used in forage production, is a highly mechanized, labor-efficient system for harvesting and handling your forage. The large round bale system is basically a one-man operation. Large round bales will weigh 500 to 3,000 pounds with dimensions varying with the baler manufacturer and model. Usually the bales are 5 to 7 feet long and 5 to 7 feet in diameter. Bale weight depends not only on dimensions but also on the type and quality of hay baled.

Properly made and stored, large round bales are weather-resistant and suffer a minimum loss of quality. Improperly made and stored large round bales can lose up to 50 percent of their feeding quality. Large round bales can remain in the field until it is convenient to move them. You can buy inexpensive equipment to move the bales.

## Moisture Percentage

The best moisture percentage for haling large round bales is the same as for baling conventional rectangular bales. An exact recommendation for baling is difficult to make due to different crops and different individual preferences. One good rule is to bale at a moisture content that has been successful for you in producing conventional bales. A moisture content too low for good round haling will cause excessive leaf shatter and high field losses. Also, dry hay will not compact sufficiently to form an all-weather bale.

Generally, harvesting hay during early stages of maturity produces bales that have lower storage losses than late-cut material. Large round bales are usually baled at too high a moisture content; this leads to higher incidence of spoilage and higher risk of fire. If the hay wraps, around the belt rolls, moisture content is too high.

## The Windrow

A windrow that is uniform in width and depth is essential for producing cylindrical large round bales of uniform density. Windrows just over half the width or just under the total width of the baler pickup produce well-shaped bales. In most cases this width will be just less than 3 1/2 feet or just more than 5 1/2 feet. Avoid windrow widths between 3 1/2 and 5 1/2 feet, because they will cause barrel- or cone-shaped bales. Remember, a heavy windrow improves feeding of material, reduces field losses, puts less wear and tear on the baler and tractor, and permits the production of more bales per hour.

You can rake light crops into heavier windrows by combining two or more windrows. You can use twin rakes to make one or two windrows. Under ideal crop conditions a mower conditioner-windrower works best with the windrowing shields set for ideal windrow width. Rake the same direction you mowed and rake just prior to excessive leaf shatter to reduce your field losses.

## Baling

### Tractor

Most large round balers will require a tractor of 50 or more PTO horsepower. Hydraulic connections will be required, with the number depending on the baler being used. For the best pickup operation the tractor wheels (front and rear) should be spaced far enough apart to straddle the windrow. In most cases this would be 66 to 72 inches between the tires. In heavy windrows you may need to attach a shield under the drawbar to prevent bunching of the material.

### Baler work rate

Research on different large round balers computes work rate as total tons of hay baled per hour. Work rate for a large round baler was found to be limited more by baler pickup performance than by bale chamber capacity.

### Leaf loss

Leaf losses occur at the windrow pickup and the bale chamber. Average leaf loss has been reported at 11 percent at the pickup and 16 percent from the bale chamber.

## Reducing Losses

### Pickup losses

To reduce pickup losses, follow these guidelines:

- Match baler pickup width to mower-conditioner or windrower.
- Set windrow width either slightly more than one-half the length of the bale or slightly less than the length of the bale.
- Leave windrows as heavy as possible.

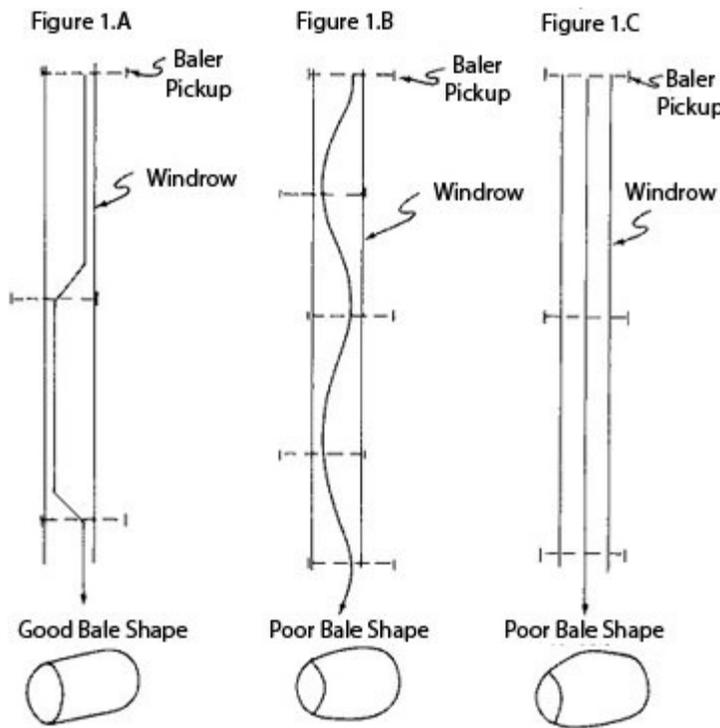
### Bale chamber losses

The length of time required to form the bale in the chamber determines bale chamber losses. Since hay is in constant agitation while the bale is being formed, some hay works its way out of the chamber. Bale chamber leaf losses range from 16-40 percent and should be 16 percent or less. Bale chamber losses from conventional square bales average 2 to 5 percent. To reduce bale chamber losses follow these guidelines:

- Make windrows as heavy as possible.
- Make sure hay is conditioned.
- Bale hay when moisture is at the maximum level that permits safe storage (20 to 25 percent).
- Shorten time in the baling chamber by keeping feed rate as high as possible.
- In light crop conditions, reduce power take-off speed and run tractor in higher gear to maintain ground speed. This results in fewer turns per bale. Although it does increase pickup loss, total leaf loss is reduced.

## Narrow Windrows (less than 3 1/2 feet wide)

You end up with undesirable barrel-shaped bales when you follow a smooth weaving pattern as you move back and forth on narrow windrows (Figure 1B) or when you drive straight down the windrow (Figure 1C). For more uniform bales, make sharper turns as shown in Figure 1A. First, crowd material into one side of the pickup for 10-12 seconds; then cross quickly to the other side and crowd material into the opposite side of the pickup for 10-12 seconds. Stay on each side more than 10-12 seconds for lighter crops and less than 10-12 seconds for heavier crops.

**Figure 1**

Pickup pattern for narrow windrows. Crossover the row and hold for 10-12 seconds. Then cross sharply back to the other side and hold for 10-12 seconds (Figure 1A). Do not weave smoothly from side to side (Figure 1B) or drive straight down the windrow (Figure 1C).

## Operating the Baler

Baler operation varies among different makes, and it is absolutely necessary to correctly follow the baler operator's manual. Forming weather-resistant bales that will store properly depends upon the operator's skill.

Follow these guidelines to improve your skill as a baler operator:

- Review the operator's manual.
- Attend training sessions conducted by baler dealer and/or company.
- Talk any problems over with dealer.
- Check with other baler operators.
- Continually study results and mistakes of other farmers.
- Learn the best operating techniques for the baler you are using.

### Twine

Twine (binder and baler sisal) can rot on the underside of bales where the bales contact the ground. If this presents a problem, use plastic twine.

### Wraps

The more you have to move a bale, the more wraps it needs. The appropriate number of wraps depends on such factors as crop, wind, moving, outdoor storage, indoor storage and stacking. Make the original wrap without moving the twine tube, then allow 6 to 10 inches between each succeeding wrap. Also, remember that excessive twine tension will cause the bale to absorb more moisture than bales with proper twine tension.

### Chemical preservatives

Research is being conducted on chemicals for treating high-moisture hay. At this time, it appears there is no economic advantage for using chemical preservatives on large round bales. Manufacturers have not made attachments available for large round bale machines to add preservatives while baling.

## Related MU Extension publications

- G1250, Large Round Balers  
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G1250>
- G1957, Large Round Bales: Safety  
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G1957>

Order publications online at <http://extension.missouri.edu/explore/shop/> or call toll-free 800-292-0969.



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