Getting Started with Baled Silage

Baled silage (baleage) is forage baled at **40–60% moisture**, wrapped airtight in plastic to promote fermentation and preserve quality. It can be made from any forage suitable for conventional silage, including grasses, legumes, and crops like corn.

Advantages of Baled Silage

- **Uses Existing Equipment:** Same machinery as dry hay baling—no need for specialized harvesters.
- **Lower Labour and Energy:** Requires less time and fuel than chopped silage systems.
- **Flexible and Scalable:** Easy to expand production; bale wrapping is not a limiting factor.
- **Faster Drying:** Requires only **13–20 hours** of wilting versus **40+ hours** for dry hay.
- **Harvest at Optimum Stage:** Ensures high-quality forage and better nutrient retention.
- **Small Batch Capability:** Allows handling of small amounts efficiently.
- **Producer-Controlled Schedule:** Enables timely first cut and subsequent cuts for maximum quality.
- **Utilizes Diverse Forage:** Suitable for weeds, green feed, or late-cut forage difficult to dry.
- **Reduced Leaf Loss:**
    - Field loss: **5–10%** vs. **25–30%** for dry hay.
    - Less leaf loss during feeding.
- **Improved Palatability:** Reduces feed waste compared to dry hay.
- **Better Appearance:** Retains natural green color due to lower fermentation temperatures—ideal for horse feed markets.
- **Health Benefits for Horses:** Lower dust reduces respiratory issues associated with dry hay.

Disadvantages of Baled Silage

While baled silage offers many benefits, producers should consider the following limitations and management challenges.

- **Higher Annual Costs:**
    - Plastic wrap adds expense compared to chopped silage.
    - However, overall capital cost may be similar since no additional harvesting system is required.

- **Equipment Investment:**
  - Tube and bale-wrapping equipment require extra capital.
  - Smaller operators may opt for custom wrapping services.
- **Plastic Disposal:**
  - Used plastic must be hauled to landfills; burning is prohibited due to toxic fumes.
  - Recycling programs are emerging in some regions.
- **Heavy Bale Weights:**
  - Bale weight increases significantly with moisture (e.g., 6-ft bale at 65% moisture = 2,800 lb).
  - May exceed handling capacity of smaller equipment; adjust bale size accordingly.
- **Risk of Spoilage:**
  - Plastic punctures allow air entry, causing mold.
  - Rodents, birds, wildlife, pets, wind, and hail can damage wrap.
- **Moisture Challenges:**
  - **Low moisture (<40%)**: Poor fermentation, high mold risk.
  - **High moisture (>70%)**: Sour silage, harmful by-products.
- **Shorter Storage Life:**
  - Compared to chopped silage; use within recommended time frame.
- **Freezing Risk:**
  - High-moisture or poorly fermented bales may freeze in cold weather.
- **Feeding Limitations:**
  - Open bales fed outdoors must be consumed within **3 days** in cold conditions to prevent freezing.

Moisture: The Critical Factor

- **Target moisture: 50%** (acceptable range: 40–60%).
- Below **40%:** Less dense bales - poor fermentation, higher mold risk; use before spring.
- Above **60%:** Heavy bales, risk of freezing, increased effluent (liquid waste) losses.
- **Wilting:** Bale when crop drops from ~80% (standing) to 50–55%.
- Avoid moisture from **dew or rain**—produces poor-quality silage.

Bale Weight by Moisture Level

Diameter	20%	40%	55%	65%
4 ft	800 lb	1,060 lb	1,400 lb	1,800 lb
5 ft	1,000 lb	1,300 lb	1,700 lb	2,300 lb
6 ft	1,250 lb	1,600 lb	2,200 lb	2,800 lb

Proper Sealing

- Make **firm, dense bales** and wrap airtight immediately.
    - It is very important to reduce respiration (use of oxygen by the plant to produce carbon dioxide) and complete the aerobic phase as soon as possible
- Tears or loose wrapping allow air entry, causing mold.
- Crops high in carbohydrates (corn, grasses) ferment easily; legumes ferment slower and may need inoculants.

The Fermentation Process

- Requires **adequate moisture** and an **oxygen-limited environment**.
- Microbial activity produces **organic acids** (lactic, acetic, propionic) that inhibit spoilage and stabilize forage.
- Fermentation typically completes in **2–4 weeks**, followed by a stable storage phase.

Fermentation Guidelines:

- **Dense, Airtight Bales:**
    - Pack bales firmly and seal immediately to minimize oxygen and prevent mold.
- **Harvest and Seal Promptly:**
    - Only cut what can be wrapped the same day.
    - In hot weather, unwrapped forage can begin fermenting within hours, causing heat damage and reduced digestibility.
- **Prevent Contamination:**
    - Avoid manure contact and minimize soil contamination by limiting raking.
    - Do not use forage that has been rained on—lower sugar content reduces fermentation quality.
- **Harvest at Correct Stage:**
    - Avoid overly mature forage; low sugar and stiff stems hinder fermentation and may puncture plastic.
- **Use Inoculants:**
    - Apply **lactobacillus bacteria inoculant**, especially for alfalfa.
    - Research shows improvements of **+5% intake** and **+11.6% daily weight gain**.
- **Manage Low-Moisture Forage:**
    - For forage at **25–35% moisture**, apply **buffered propionic acid or anhydrous ammonia** at **1–2% of dry matter** to prevent mold.

Storage and Quality Indicators

- **pH:**
  - Below 5 = good storage life
  - Above 5 = use before spring
- Request pH analysis when testing feed.

Key Takeaways

- Target moisture: **40–60%** for optimal fermentation.
- Seal bales immediately after baling.
- Use inoculants and preservatives when conditions are less than ideal.
- Avoid rained-on or mature forage for best results.
- Monitor pH and feed quality before use.

Contact Us

This fact sheet was developed by the Manitoba Agriculture Livestock Specialist.

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