

Forage Harvest Management

Conservation Practice Specification Guide

RI-511



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General Specifications

Specific forage harvest management requirements are prepared in accordance with the NRCS Field Office Technical Guide. Refer to Massachusetts NRCS "Forage Harvest Management" (511) conservation practice standard.

Criteria

Stage of Maturity

Harvest forage at the stage of maturity that provides the desired quality and quantity (Table 2).

Delay harvest if prolonged or heavy precipitation is forecast that would seriously damage cut forage. Where weather conditions make it difficult to harvest the desired quality of forage, use mechanical or chemical conditioners and/or ensile.

Moisture Content

Store hay or silage/haylage crops at the ideal moisture range for the type of storage structure(s) being utilized (Table 1). For optimal forage quality, rake, ted, or invert swaths, and bale when hay has sufficient moisture to prevent leaf loss. Forage shall be baled at optimum moisture levels to preserve forage quality and quantity. Approximate percent moisture should be as follows:

- Bale field cured hay at 15 to 20 percent moisture.
- Bale forced air dried hay or hay treated with a preservative at 20 to 35 percent moisture.
- Rake hay at 30 to 40 percent moisture.
- Ted or invert swaths when moisture is above 40 percent moisture.

Harvest ensilage at optimum levels to preserve forage quality and quantity. Approximate optimum moisture should be as follows:

- Top unload upright (tower), bunker and horizontal bag silos at 60 to 68 percent moisture.
- Bottom unload upright silos at 45 to 55 percent moisture.
- All corn silage regardless of storage structure at 63 to 68 percent moisture.

Critical components for any silage system (to avoid toxic organisms and chemicals) are to ensure air tight forage containment and proper moisture content. Making baleage requires high levels of moisture management. Moisture content and the quality of the air tight bale containment are critical.

Stubble height

Cut forage plants at a height that will promote the vigor and health of the desired species (Table 2). Cutting heights will provide adequate residual leaf area; adequate numbers of terminal, basal or auxiliary tillers or buds; insulation from extreme heat or cold, and/or unsevered stem bases that store food reserves needed for full, vigorous recovery.

Operation and Maintenance

- Before forage harvest, clear fields of debris that could damage machinery, or if ingested by livestock, lead to sickness (for example, hardware disease) or death.
- Monitor weather conditions and take action accordingly before and after cutting to optimize forage wilting or curing time to preserve feed quality and prevent forage swaths or windrows from smothering underlying plants.
- Inspect and repair harvesting equipment following manufacturer's preventative maintenance procedures.
- All shields shall be in place during machine operation to prevent injury or death. Shut off machinery before working on or unplugging moving parts.
- Select equipment sizes and capacities that will in a timely and economically feasible manner handle the acreage normally harvested.
- Operate all forage harvesting equipment at the optimum settings and speeds to minimize loss of leaves.
- Set shear-plate on forage chopper to the proper theoretical cut for the crop being harvested. Keep knives well sharpened. Do not use recutters or screens unless forage moisture levels fall below recommended levels for optimum chopping action.
- If ensiling, ensure good compaction and/or an air-tight seal to exclude oxygen and mold formation.

References

- Griffin, Tim. Alfalfa Winterkill and Forage Options. 1992. University of Maine Cooperative Extension Fact Sheet. Orono, ME.
- Griffin, Tim. Growing Forage Grasses in Maine. 1995. University of Maine Cooperative Extension Bulletin 2262. Orono, ME.
- Griffin, Tim . Growing Forage Legumes in Maine. 1995. University of Maine Cooperative Extension Bulletin 2261. Orono, ME.
- Kersbergen, Rick. This Old Hayfield. 2004. University of Maine Cooperative Extension Bulletin 2491. Orono, ME.
- Pitt, R. E. Silage and Hay Preservation. 1990. Northeast Regional Agricultural Engineering Service, Cornell Cooperative Extension. NRAES - 5. Ithaca, NY.
- USDA NRCS GLCI-PA. Haylage. 2000. East Region Technology Web Page.
- Vokey, Frans. 2004. Comparison of Baleage Quality Over Time and With Use of Additives. Cornell Cooperative Extension of Lewis County.
<http://www.cce.cornell.edu/lewis/PDFs/Research%20Reports/NNY%20Baleage%20Additives%20Report%204-1-04.pdf>

Table 1. Summary of Good Hay-Making Practices from “Silage and Hay Preservation” (NRAES-5)

Practice	Reasons	Benefits
Mow forage early in the day.	Allow full day’s drying time.	Faster drop in moisture. Less respiration loss. Less likelihood of rain damage. High quantity, high quality.
Form into spread swath.	Increase drying rate.	Faster drop in moisture. Less respiration loss. Less likelihood of rain damage. High quantity, high quality.
Rake or ted at 40-50% moisture.	Increase drying rate.	Faster drop in moisture. Less respiration loss. Less likelihood of rain damage. Less leaf shatter. High quantity, high quality.
Bale hay at 18-20% moisture.	Optimize preservation.	Less leaf shatter. Inhibition of molds, browning. Low chance of fire/spontaneous combustion. High quantity. High quality.
Store hay under cover.	Protect from rain and sun.	Inhibition of molds, browning. Less loss from rain damage. High quantity. High quality.

Table 2. University of Maine Cooperative Extension’s Summary of Good Hay-Making Practices

Species	Harvest Period	Growth Stage	Minimum Stubble Height After Cutting
Orchardgrass	First	Boot to early head stage.	2-3”
	Second	After 8-10” recovery regrowth.	2-3”
Smooth Bromegrass	First	Full head.	2-3”
	Second	When basal sprouts appear at soil surface.	2-3”
Timothy	First	Late boot to early head.	2-3”
	Second	When basal sprouts appear at soil surface.	2-3”
Alfalfa	First, Second, and Third	Full bud, ¼ bloom or after 5-6 week recovery period.	1-2”
Ladino and Red Clover	First and Second	¼ to ½ bloom or 8-10”	2”