

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

FORAGE HARVEST MANAGEMENT

(Ac.)

CODE 511

DEFINITION

The timely cutting and removal of forages from the field as hay, green-chop or ensilage.

PURPOSE

- Optimize yield and quality of forage at the desired levels
- Promote vigorous plant re-growth
- Maintain stand life
- Manage for the desired species composition
- Use forage plant biomass as a soil nutrient uptake tool
- Control insects, diseases and weeds
- Maintain and/or improve wildlife habitat

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where machine harvested forage crops are grown.

CRITERIA

General Criteria Applicable to All Purposes

Forage will be harvested at a frequency and height that will maintain a desired healthy plant community through its life expectancy.

Stage of Maturity. Harvest forage at the stage of maturity that provides the desired quality and quantity. Early cutting produces higher quality but lower quantities. Delayed harvest increases the yield but lowers the quality.

Delay harvest if prolonged or heavy precipitation is forecast that would seriously damage cut forage. Where rainfall and/or humidity levels cause unacceptable forage quality, use mechanical or chemical conditioners and/or ensile.

Moisture Content. Harvest silage/haylage crops within the optimum moisture range for the type of storage structure(s) being utilized.

Treat direct cut hay crop silage (moisture content >70%) with chemical preservatives or add dry feedstuffs to avoid fermentation and seepage losses of digestible dry matter.

For optimal dry hay quality, rake hay at 30 to 40 percent moisture and ted or invert swaths when moisture is above 40 percent.

To preserve forage quality and quantity, bale field cured hay at 15 – 20 percent moisture and bale force-air-dried hay and 20 – 35 percent moisture.

Length of Cut. When harvested for ensilage forage will be chopped to a size appropriate for type of storage structure (high moisture wrapped or tubed bales) that allows adequate packing to produce the anaerobic conditions necessary to ensure the proper ensiling process.

Contaminants. Forage shall not contain contaminants that can cause illness or death to the animal being fed or rejection of the offered forage.

Additional Criteria to Improve or Maintain Stand Life, Plant Vigor and Forage Species Mix

Stage of Maturity and Harvest Interval. Cut forage plants at a stage of maturity or harvest

interval range that will provide adequate food reserves and/or basal or auxiliary tillers or buds for regrowth and/or reproduction to occur without loss of plant vigor.

When grasses and legumes are grown together, the legume stage of maturity is used to time the harvest except in the case of birdsfoot trefoil, Ladino clover, and white clover. These two clovers and birdsfoot trefoil tend to maintain their quality because they are indeterminate in their growth habit.

Cut reseeding annuals at a stage of maturity and frequency that ensures the production of viable seed or ample carryover of hard seed to maintain desired stand density.

If plants show signs of short-term environmental stress, management will be applied in a manner that encourages the continued health and vigor of the stand.

Stubble Height. Cut forage plants at a height that will promote the vigor and health of the desired species. 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.

Manipulate timing and cutting heights of harvest to ensure germination and establishment of reseeding or seeded annuals.

End of Season Harvest and Regrowth Interval. At least 40 days for legumes and 30 days for grasses should be allowed between the last harvest and a killing frost.

Soil Fertility. Adequate amounts of lime, nitrogen, phosphate and potash and certain minor elements are needed for yield, quality and to maintain stand life. Soil test should be followed for determining the amount of fertilizer and lime needed for sustainable hay production

Additional Criteria for Use as a Nutrient Uptake Tool

Employ a harvest regime that utilizes the maximum amount of available or targeted nutrients.

Additional Criteria to Control Disease, Insect, Weed and Invasive Plant Infestations

Schedule harvest periods to control disease, insect, and weed infestations. When a pesticide is used to control disease, insects or weeds, adhere to the specified days to harvest period stated on the pesticide label. Evaluate pest management options by planning conservation practice standard Pest Management (595).

Lessen incidence of disease, insect damage, and weed infestation by managing for desirable plant vigor. Plan and schedule removal of invasive plants.

Additional Criteria to Improve Wildlife Habitat Values

If client objectives include providing suitable habitat for desired wildlife species then appropriate harvest schedule(s), cover patterns, and plant height to provide suitable habitat for the desired specie(s) should be maintained. Harvest pattern shall be adjusted to benefit wildlife.

CONSIDERATIONS

Where applicable coordinate this practice with the current NRCS practice standard for Prescribed Grazing (528).

When nutrients or other soil amendments are applied coordinate this practice with the current NRCS conservation practice standard for Nutrient Management (590) or Waste Utilization (633) as appropriate. An excess or improper balance of nutrients such as nitrogen can produce plant material that causes toxicity in some animals.

To control forage plant diseases, insects, and movement of weeds, clean harvesting equipment after harvest and before storing. Cut forages after dew, rain, or irrigation water on leaves has evaporated.

Care should be taken to produce stored forages of the quality needed for optimum performance of the animal being fed. For instance, immature legume forages can be too low in fiber and lead to metabolic disorders in ruminants and an economic loss to the producer due to lowered animal performance.

Direct cut grass and legume silage can create silage leachate (seepage). Consider the collection, storage, and disposal of this leachate as part of an agricultural waste management system.

In conjunction with harvest options, explore storage and feeding options that will retain acceptable forage quality and minimize digestible dry matter loss. Also consider storage location for large square or round bales/balage with regards to inside vs. outside, along hedgerows, winter/mud considerations etc.

Where weather conditions make it difficult to harvest the desired quality of forage, use mechanical or chemical conditioners and/or ensile.

To reduce safety hazards, avoid operating harvesting and hauling equipment on field slopes over 25 percent, particularly on cross slope traffic patterns.

A forage test is the most reliable method to determine forage quality and insure that livestock nutrient needs are met.

PLANS AND SPECIFICATIONS

Forage Harvest Management (511) Job Sheet will be included with the plan to provide forage management and harvest guidelines.

These plans and specifications shall be consistent with this standard and shall describe the requirement for applying the practice to achieve its intended purpose.

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.

Operate all forage harvesting equipment at the optimum settings and speeds to minimize loss of leaves.

Keep forage chopper knives well sharpened. Do not use re-cutters or screens unless forage moisture levels fall below recommended levels for optimum chopping action.

Regardless of silage/haylage storage method, ensure good compaction and an airtight seal to exclude oxygen and mold formation.

REFERENCES:

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- Serotkin, N., Ed. The Penn State Agronomy Guide, 1995-1996. Pennsylvania State University. 1994. University Park, PA.
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