

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

FORAGE HARVEST MANAGEMENT

(Acre)
CODE 511

DEFINITION

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

PURPOSES

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

CONDITIONS WHERE PRACTICE APPLIES

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

CRITERIA

1. General Criteria Applicable To All Purposes

Forage will be harvested at a frequency and height that will maintain a healthy plant community for the desired species throughout its life expectancy. Cutting and harvesting should be based on the species and the species needs for adequate food reserves, basal or axillary tillers or buds for re-growth, and for the forage quality needed for the animals being fed. See Table 1 --Harvesting Guide.

**If harvested at a later stage of maturity, use for livestock that have lower nutritional needs, or balance feed ration using supplements.

**If a foliar disease or insect infestation will lower forage quality, harvest before excessive leaf loss or other damage.

***Dry Matter Content**

**Guidelines in Table 2 will be used to determine the ideal dry matter content for various harvest/storage methods.

**Direct cut hay crop silage may need to be treated with chemical preservatives to avoid dry matter losses from fermentation and/or seepage.

2. Criteria To Optimize The Economic Yield of Forage

Fertility Management

Use standard 528-A Appendix 4 Prescribed Grazing and standard 590 Nutrient Management to determine fertility needs and nutrient application rates.

Harvest State of Maturity and Harvest Interval

Utilize forage analysis to determine nutrient contents and digestible dry matter.

3. Additional Criteria To Use Plant Biomass For Nutrient Uptake

*For fields with one or more nutrients testing in high or excessive amounts, harvest as needed to bring accumulated soil nutrients within the agronomic optimum soil test range. Also, when practical and in line with the producer's objectives, consider introducing species that require high levels of particular nutrients.

*It is recommended that forage testing be done on forages that are harvested from over-fertilized fields. When needed, balance feed ration by using the actual nutrient content of the forage in lieu of "assumed" or "average" values.

4. Additional Criteria To Maintain Or Improve Wildlife Habitat

*Maintain appropriate harvest schedules, desired plant variety, cover patterns, plant stem density, and plant height to provide suitable habitat for the desired animal population. (See Upland Wildlife Habitat Standard 645.)

CONSIDERATIONS

Insects and Diseases

When insect and disease outbreaks exceed economic thresholds, and are uncontrollable by harvest management, pesticide applications may be needed. The producer should be advised to contact the local WVU extension agent or private consulting firm to determine economic threshold limits and to provide pesticide recommendations.

Leachate Control

Where forages are ensiled, silage leachate (see page) may occur. Provisions for control of this leachate need to be considered. Refer to Waste Management Standard and Specification.

Delays in Harvesting

Where rainfall and humidity levels cause unacceptable forage quality loss in at least one harvest during the year, consider ensiling the forage to reduce or eliminate field drying time. Other options are: the use of desiccants, preservatives, conditioners, barn curing, baleage, green chopping, or grazing. If grazing is used as a quality control method, follow recommendations in Standard 528A, Prescribed Grazing.

Miscellaneous Considerations:

When pastures produce forage in excess of livestock demand, consider preserving forage quality by machine harvesting a portion of the standing crop. Coordinate this with Standard 528A.

Well fertilized plants withstand more intense harvest schedules and may produce a higher

quantity and quality of forage. However, it is important to balance fertility levels with economic considerations. Coordinate this practice with Standard 590.

Select cultivars that are suitable for the harvest regime, species mix, geographic location, soils, and forage quality desired.

Specifications

All detailed planning information will be prepared in a format that is easily understood by the producer, and in accordance with current technology and policy. Information can be obtained from any reliable source with approval from the State Resource Conservationist as long as it is defensible.

Specify the following by forage crop:

Purpose of forage production

Stage of maturity for harvest

Harvest intervals

Stubble height

Number of harvests per year

Storage method

Use of existing job sheets, fact sheets, or other information sheets is encouraged. The conservation plan narrative should reference these sheets.

Operation and Maintenance

Maintenance

To insure the plant species remain productive for the expected life span, the following measures should be used:

*Grazing will be regulated to limit damage to the forage plant. This is especially critical during periods where the field is wet (compaction), in the early fall, and in early spring.

*To insure adequate root reserve, the plants will be allowed to reach the heights shown in Table 1 prior to first killing frost.

*All livestock will be removed from the fields before plants begin spring growth. Although this varies across the state, a general guideline is removal by mid February for elevations less than 2000 feet and by mid March for all other areas.

*When the desired quantity and quality of the forage decreases to unacceptable levels,

renovation may be necessary. Although not usually needed, a complete seedbed preparation may be the best economic and environmental alternative. Other options to consider include interseeding by no-till methods, tromp seeding, and frost seeding. Refer to Standard 512, Hayland Planting for recommendations.

References

1. WV FOTG, SECTION IV
2. Penn State Agronomy Guide

TABLE I – HARVESTING GUIDE

General

Harvest **new** seedlings when sufficient growth is present and the plant roots are established well enough to assure adequate food reserve storage for overwintering and vigorous spring growth. It is usually desirable to allow a new seeding to go to seed before first harvest. Fall harvest of late season seedlings should be discouraged unless adequate re-growth will occur before first killing frost.

Harvest **established** stands according to the following general guidelines. For grass-legume mixtures, harvest at the time to favor the desired species.

SPECIES	PERIOD	GROWTH STAGE	HEIGHT AT FIRST
			KILLING FROST
Alfalfa or Birdsfoot	1 st cut	Alfalfa – full bloom Birdsfoot – ¼ bloom	Final harvest of legumes should have at least 45 days of re-growth and be harvested just prior to or after the first killing frost
Trefoil	2 nd and successive	¼ bloom	
Ladino	all cuts	¼ to ½ bloom	
Red or Alsike	all cuts	¼ bloom	
Orchardgrass Fescue, and Other non- jointed grasses	1 st cut successive cuts	boot to early head after 8-10 inch recovery	5 - 6 inches
Smooth brome, Timothy, Reed Canary-grass, and other jointed grasses	1 st cut successive cuts	Smooth Brome-med. to full head. All others - early to full head When basal sprouts appear at soil surface	5 - 6 inches
Switchgrass, big bluestem, Caucasian bluestem	usually only one cutting per season	Late boot stage. CAUTION: Leave 4 – 6 inch stubble	8 inches
Summer annual Grasses (Sudan Grass or Sudan Sorghum Crosses	all cuts	For hay-typically 24 – 30 inches. Leave 4 – 6 inch stubble for fast recovery. CAUTION: Delay green chopping until grass is 18 inches or taller in height to avoid effects of prussic acid	Frosted forage should not be grazed for a week after frosting to allow prussic acid content to dissipate.

For other hay harvest recommendations, refer to agronomy guides (such as Penn State, Ohio State, VPI) or other recognized references.

TABLE II – Optimal Forage Dry Matter (%) Levels

STORAGE METHOD	HAYLAGE	CORN
Upright or tower, conventional	35 - 40 %	32 - 37 %
Upright or tower, oxygen limit	45 - 60 %	40 - 45 %
Bunker or horizontal	30 - 35 %	30 - 35 %
Bag Silo (plastic tubes)	40 - 50 %	30 - 35 %
Baleage (plastic wrapped round Bales)	40 - 50 %	n/a
Field cured hay	80 - 85 %	n/a
Forced air dried baled hay	65 - 80 %	n/a