FORAGE HARVEST MANAGEMENT
Job Sheet

Natural Resources Conservation Service (NRCS) September, 1997

Cooperator Name: _____ **County:** _____

Applicable Program: _____ **FSN:** _____

Contract Number: _____ **OPID No:** _____ **Tract No:** _____

Scheduled Completion Date(s): _____ **Contract Item No:** _____

Planned by: _____ **Date Planned:** _____

Information on this job sheet is considered to be part of the contract and/or conservation management system that has been developed with the cooperator.

Definition

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

Purpose (Enter the number of the primary purpose in table 1, on page 3).

1. Optimize the economic yield of forage at the desired quality and quantity.
2. Promote vigorous plant regrowth.
3. Maintain the desired species composition of the stand.
4. Use forage plant biomass as a nutrient utilization tool.
5. Control insects, diseases, and weeds.
6. Maintain and /or improve wildlife habitat.

Conditions Where Practice Applies

This practice applies to all lands where mechanically harvested forage crops are grown.

General Specifications

This forage harvest management job sheet is developed according to the technical criteria for Forage Harvest Management (Code 511) as contained in the local NRCS Field Office Technical Guide (FOTG).

1. Forage will be harvested at a frequency and height that will maintain a desired healthy plant community through its life expectancy.
2. Forage will be harvested at the appropriate stage of maturity to provide the desired quality and quantity of harvested forage, while maintaining the optimum regrowth conditions.
3. Forage will be harvested at as near to optimum moisture levels as possible to preserve forage quality and quantity.
4. Fields will be regularly inspected to determine the level of insects, weeds and other infestations.
5. Pesticides applications will be in accordance with NRCS Conservation Practice Standard 595 (Pest Management). All pesticides will be applied according to label directions to control pest infestations.
6. Nutrients will be applied according NRCS Conservation Practice Standard 590 (Nutrient Management).
7. Fields maintained in forage crops shall be protected from soil erosion during production and harvest intervals**.**

Specifications for Using Forage as a Nutrient Utilization Tool

- Forage will be managed to remove the highest quantity of forage from the land while maintaining an acceptable level of quality.
- Forage harvest will be managed to preserve the longevity of the stand.

Specifications for Wildlife Habitat

- Timing and method of harvest shall consider wildlife populations present within the forage area.
- Special care is needed during the primary nesting season.
- Pesticides should be selected and applied with consideration to their effect on wildlife populations.
- Avoid harvesting forage in a circular manner. Instead, harvest forage in a back and forth manner working from one side of the field to the other. This allows the wildlife an escape route.

Specifications for Maintaining or Improving Wildlife Habitat

- Leave 20 to 30% of the forage un-harvested for nesting, foraging and escape cover.
- Schedule harvests to maintain the highest quality nesting, foraging, or escape cover.

Operation and Maintenance

- Clear fields of debris that could damage machinery, cause injury to humans, or cause sickness or death to animals if ingested.
- Monitor weather conditions and take appropriate action to optimize forage quality and prevent damage to forage plants by harvesting activities or delayed regrowth.
- Inspect and maintain equipment following manufacturer's preventative maintenance procedures.
- Maintain all safety shields and equipment in place and in good working order during machine operation to prevent injury to humans. Shut off machinery before working on or unplugging moving parts.
- Select equipment sizes and capacities that will allow timely and economically feasible harvesting of the forage crops.

Additional Notes:

Site-Specific Specifications

The fields/acreage planned for forage harvest management are indicated in Table 1:

TABLE 1 **Site-Specific Specifications**[1]

Tract/ Field Number	Primary Purpose[2]	Forage Species	Recommended Stage of Maturity or Forage Height to Begin Cutting	Recommended Minimum Cutting Height	Recommended Regrowth Period
Example	1	Bahiagrass	6 inches	2 inches	28 Days

[1] (This table will be completed by NRCS representatives and the cooperator. Use additional sheets as necessary. Refer to Table 2 for guidance.)

[2] Enter the number of the primary purpose identified on page 1 in this column.

Specifications for Stage of Maturity, Cutting Heights, Stubble Heights and Regrowth Period.

Table 2 Specifications for Stage of Maturity, Cutting Heights, Stubble Heights and Regrowth Period.[3]

Forage Species	Stage of Maturity to Harvest for Highest Quality	Plant Height to Begin Harvest	Minimum Cutting Height	Estimated Regrowth Period
Aeschynomene	Very early bloom	12 inches	8 inches	NA*
Alfalfa 77	Early to full bloom	12 inches	3-4 inches	30-35 days
Alyceclover	Early to full bloom	8 inches	3-4 inches	NA
Bahiagrass	NA	6-12 inches	2 inches	28-35 days
Bermudagrass	NA	14-16 inches	3-4 inches	28-35 days
Carpon desmodium	Early to full bloom	NA	3-4 inches	NA
Clovers	Early to full bloom	NA	3-4 inches	35-42 days
Grasses, perennial	NA	14-16 inches	3-4 inches	5-7 weeks
Hemarthria (Limpograss)	NA	14-16 inches	3-4 inches	28-35 days
Indigo, hairy	Very early bloom	14-16 inches	4 inches	NA
Millet	Early Boot	NA	6-8 inches	
Oats	Milk to soft dough	NA	2-3 inches	NA
Pangolagrass	NA	12-18 inches	3-4 inches	35 days
Pearl Millet	Early Boot	NA	6-8 inches	NA
P. Peanut	Early to full bloom	10-12 inches	2-3 inches	6 weeks
Rhodesgrass	NA	14-16 inches	3-4 inches	28-35 days
Rye	Boot to early head	NA	2-3 inches	NA
Ryegrass	Early to full bloom	NA	2-3 inches	NA
Stargrass	NA	14-16 inches	3-4 inches	28-35 days
Sorghum	Boot to soft dough	NA	6-8 inches	NA
Sudangrass	Early Boot	NA	6-8 inches	NA
Wheat	Early head to soft dough	NA	2-3 inches	NA

* NA-Not Applicable

[3] Note: the information provided in Table 2 is based on reference material. Successful forage harvest management requires expertise to be applied by the producer on a site specific basis. *Information for this table was compiled from Institute of Food and Agricultural Sciences publications, Southern Forages by Ball, Hoveland and Lacefield, and other sources and publications.*

Additional Information

Stage of Growth

All forage plants tend to produce higher quality forage when harvested before they mature. Young plants have thinner cell walls and consequently are easier for animals to digest. Plants that are early in their growth cycle usually contain higher levels of nitrogen. The higher levels of nitrogen result in higher levels of crude protein. If the goal is to maintain grazing animals on a high nutritional plane or to use forage in a waste utilization plan, it is necessary to harvest plants near their peak quality. Table 2 indicates the appropriate growth stage to harvest various forage plants for their highest quality. Descriptions of the various growth stages for grasses and legumes are listed below.

Grasses

- Vegetative--from seedling to boot stage.
- Boot stage-- seed head has not emerged but has begun to swell the top of the plant.
- Head-- Head has emerged but plant has not flowered.
- Flower-- Head has flowered and pollen is being distributed.
- Mature-- the flower has developed into seed and the plant has reached maximum maturity.

Legumes

- Vegetative-- from seedling stage until stem elongation and/or prebud stage.
- Prebud-- full stem elongation is initiated and some buds are showing.
- Bud-- full stem elongation and some buds are showing.
- Bloom-- plant is in full flower.
- Mature-- Manufacture of food by the plant has ceased and the seeds are mature, usually about 30 days after full bloom.

Plant Height to Begin Harvest

Forage height has an effect on quality. As plants grow taller the amount of Crude Protein (CP) and Total Digestible Nutrients (TDN) they contain declines. This is caused by the thickening of the cell wall and increased allocation of nutrients to the flowering parts of the plant. Although a person may harvest more forage by allowing it to grow taller they may harvest a lower amount of nutrients. For example, a sorghum-sudangrass hybrid will have a decline of 5% in crude protein, if it is cut at 40 inches instead of 20 inches. This would reduce Crude Protein production approximately 216 pounds of Crude Protein per acre, or approximately 35 pounds less nitrogen per acre.

Minimum Cutting Height

Stubble height or the minimum cutting height is very important. The goal of harvesting forage is to capture the maximum amount of nutrients as possible. This is accomplished by harvesting the forage as close to the soil surface as possible while maintaining adequate stubble height. If plants are harvested to close to the soil surface much of the leaf area is removed. This may result in an insufficient amount of leaf area remaining to assimilate the needed material for regrowth from the atmosphere (carbon dioxide, oxygen and sunlight). It is important to leave enough leaf area on the plant, so it capable of rapid regrowth. In addition cutting forages below the recommended minimum stubble height will remove basal, and axillary tillers and buds needed to provide rapid regrowth. If a forage plant is harvested below the recommended minimum cutting height;

- regrowth will be slowed,
- opportunities for weed encroachment will increase,
- the amount of harvested forage will decline and,
- the plant may die.

Regrowth Period

An important component of forage harvest management is the amount of time forage is allowed to re-grow before it is harvested again. If this period is to short, the plant will not have enough time to restore the necessary carbohydrate reserves in the plant crown and roots. An inadequate regrowth period will also lead to stand declines and weed infestations. The recommended regrowth periods are shown in Table 2.