

511- Forage Harvest Management
Job sheet

Producer: _____ **Date:** _____
Location: _____ **Contract:** _____
Farm Name: _____ **Farm/Tract Number:** _____

Definition

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

Purposes

This practice may be applied as part of a conservation management system to accomplish one or more of the following purposes:

- Optimize the quality and quantity of harvested forage to meet the producer's management objectives
- Maintain forage crop stand life for the desired time period.
- Promote vigorous plant regrowth.
- Maintain desired forage species composition of the stand.
- Use forage plant biomass as a nutrient uptake tool.
- Control insects, diseases, and weeds.
- Maintain and/or improve wildlife habitat.
- Prevent soil erosion.

Conditions where this practice applies:

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

Criteria:

General criteria applicable to all purposes stated above

- This 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)
- Forage shall be harvested at a frequency and height that will maintain a desired healthy plant community through its life expectancy.
- 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.
- Forage will be harvested at as near to optimum moisture levels as possible to preserve forage quality and quantity.
- Fields will be regularly inspected to determine the level of insects, weeds, and other infestations.

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- Pesticide applications will be in accordance with NRCS Conservation Practice Standard 595 (Pest Management).
- Nutrients will be applied according to NRCS Conservation Practice Standard 590 (Nutrient Management).
- 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 quality 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 Maintenance or Improvement

- Timing and method of harvest shall consider wildlife populations present within the forage area.
- Special care is needed during the primary nesting season.
- Chemicals should be selected and applied with consideration to their effect on wildlife populations. All chemicals will be applied in accordance with the label instructions.
- Avoid harvesting forage in a circular manner. Instead, harvest forage in a back and forth manner. This allows wildlife an escape route.
- Leave 20-30% of the forage un-harvested for nesting, foraging, and escape cover.
- Schedule harvests to maintain the highest quality nesting, foraging, and/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.

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Purpose(s):

Site-Specific Specifications: Table 1

Tract or Field Number	Primary Purpose	Forage Species	Stage of Maturity to Harvest for Highest Quality	Plant Height To begin Harvest	Min Cut Height	Estimated Regrowth Period

Additional comments:

This practice will be planned and applied as part of a management system in conjunction with the following FL NRCS Conservation Practice Standards:

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Client Statement:

The client has:

- a. Received a copy of the specifications and understand the contents and requirements.
- b. It is the responsibility of the client to obtain all necessary permits and/or rights, and to comply with all ordinances, laws and regulations pertaining to the application of this practice.

Client Signature: _____ Date: _____

I have completed a review of the information provided by the client and certify this practice has been applied in accordance with NRCS Standards and Specifications.

Certification by: _____ Date: _____

Job Title: _____ Date: _____

Additional Information to Consider

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 plant or to use or to use a forage 1 waste utilization plan, it is necessary to harvest plants near their peak quality. Table 1 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 state - 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 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 ceases and 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 CP production approximately 216 lbs CP/ac, 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 too 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 is capable of rapid regrowth. In addition, cutting forages below the recommended minimum stubble height will remove basal, axillary tiller and buds necessary for rapid regrowth. If a forage plant is harvested below the recommended minimum cutting height:
 - Regrowth will be slowed
 - Opportunities for weed encroachment will increase

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- The amount of harvested forage will decline
- 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 too 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. Recommended regrowth periods are shown in Table 1.

Wildlife Considerations:

- Maintain appropriate harvest schedule(s), cover patters, and plant height to provide suitable habitat for the desired wildlife species.
- Avoid harvesting in a circular manner. Harvest forage in a back and forth manner working from one side of the field to the other. This allows wildlife an escape route.
- If harvest will occur on multiple fields on the same farm, time cuttings to ensure some habitat and cover is available at all times.
- Schedule forage harvests to avoid critical periods in the life cycle of local wildlife species.

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.*