

## DESIGN AND INSTALLATION GUIDE

### Forage Harvest Management - 511

#### Specifications

##### 1. Harvesting

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

a. Harvest forage at the stage of maturity that provides the desired quality and quantity. For optimizing the stage of maturity, refer to Table 1 and/or North Dakota State University Cooperative Extension Publication AS-1117 (Quality Forage for Maximum Production and Return) at <http://www.ext.nodak.edu/extpubs/ansci/range/as1117w.htm#>.

b. Harvest silage/haylage crops at the ideal moisture range for the type of storage structure(s) being utilized. Contact your local North Dakota State University Cooperative Extension Office for a copy of publication AS-995 "Making Quality Silage" for further details.

c. Bale at optimum moisture levels to preserve forage quality and quantity. According to North Dakota State University Cooperative Extension Publication AS-1190 (Minimizing Hay Losses and Waste), hay moisture content is the largest single factor contributing to leaf loss. Refer to this bulletin for recommendations on hay moisture limits found at <http://www.ext.nodak.edu/extpubs/ansci/range/as1190w.htm>.

d. The optimum time to cut various grasses and legumes depends on growth habits of the species involved. See Table 1 - Forage Harvest Management for preferred growth stage for harvesting.

##### 2. Weed control

a. On properly managed hayland, weeds are generally not a problem. When weeds are uncontrollable by forage harvest management alone, pest management (practice code 595) should be planned and applied. Refer to North Dakota State University, Agricultural Weed Control Guide (Circular W-253 Rev.) for specific herbicide recommendations on forage crops in North Dakota at <http://www.ag.ndsu.nodak.edu/cropprod.htm>.

##### 3. Fertilizing

a. For higher quality and quantity of forage, fertilize according to soil test or use recommendations in the North Dakota State University Cooperative Extension Service Circulars SF-721 (Fertilizing Established Grass, Native Grass, Irrigated Grass and New Seedlings of Grass) and SF-728 (Fertilizing Alfalfa, Sweet Clover, Alsike Clover, Birdsfoot Trefoil, Red Clover and Grass-Legume) found at <http://www.ext.nodak.edu/extpubs/soilfert.htm>.

b. Removal of biomass from the field will usually result in decreased amounts of available phosphorus. Fields short in phosphorus and potassium will require fertilization to maintain the legume component.

#### 4. Alfalfa management

- a. For information on alfalfa management, see North Dakota State University Cooperative Extension Service Circular R-571 (Alfalfa Management in North Dakota) at <http://www.ext.nodak.edu/extpubs/plantsci/hay/r571-1.htm>.

#### 5. Rangeland (native hayland)

Rangeland may be harvested for hay when the proper management techniques are applied. Normally weed control and fertilizer are not needed.

- a. Rangeland occurring on ecological (range) sites that have a water table throughout the growing season or receive additional moisture throughout a major portion of the growing season may be harvested once a year. Plant regrowth shall not be grazed until after complete dormancy in the fall.
- b. On ecological (range) sites that do not have a water table or do not receive additional run-on moisture, harvesting hay should be limited to one harvest every two years. Plant regrowth after harvest shall not be grazed until after complete dormancy in the fall.
- c. Time of harvest should be when the major species harvested is in the late boot to early heading stage.

#### **Planning Considerations**

- a. Other practices, such as Prescribed Grazing (528), Nutrient Management (590), Pasture and Hayland Planting (512), and Pest Management (595) may be used may be used to implement or facilitate forage harvest management.
- b. Consideration should be given to wildlife species. Delaying haying until after July 15 allows for most species to fledge their young. Consider planting species with later maturity to allow for harvesting after nests have fledged. Avoid mowing around the field. Mow back and forth or from the inside to the outside of the field. Consider using flushing bars on cutting equipment.
- c. Consider storage and feeding options that will retain acceptable forage quality and minimize digestible dry matter loss.
- d. Consideration should be given to the use of annual forages as needed to balance forage needs. Additional information on annual forages can be found at:  
<http://www.ext.nodak.edu/extpubs/plantsci/hay/r1016w.htm>  
<http://www.ext.nodak.edu/extpubs/ansci/livestoc/as1182.htm>

#### **Documentation**

Use ND-CPA-511e Forage Harvest Management Design and Documentation or equivalent, for documentation of this practice.

**Table 1. Forage Harvest Management**

SPECIES <sup>1</sup>	WHEN TO CUT <sup>4</sup>	MINIMUM STUBBLE HEIGHT	OPTIMUM REGROWTH BEFORE KILLING FROST <sup>5</sup>
Creeping Foxtail Intermediate wheatgrass Kentucky bluegrass Meadow brome Pubescent wheatgrass Smooth brome Tall wheatgrass Western wheatgrass	1 <sup>st</sup> cutting - Medium to full head  Later cuttings - when new basal sprouts appear or regrowth reaches appropriate cutting heights (12"-15")	3 inches	6 inches
Slender wheatgrass	Early head	3 inches	6 inches
Crested wheatgrass Green needlegrass	Boot to early heading or when regrowth is 14 to 20 inches	3 inches	6 inches
Reed Canarygrass	1 <sup>st</sup> cutting - early boot  Later cuttings: when basal sprouts appear or regrowth reaches appropriate cutting heights (12"-15")	3 inches	6 inches
Prairie cordgrass	18 to 24 inch plant height	6 inches	10 inches
Big and Sand bluestem <sup>2</sup> Indian grass <sup>2</sup> Switchgrass <sup>2</sup>	Early boot to boot stage	6 inches	10 inches
Alfalfa	1 <sup>st</sup> cutting - late bud early flower Later cuttings: 1/4 bloom	2 inches	8 inches
Clovers (alsike, ladino, red, White)	All cuttings: 1/4 bloom	4 inches	6 inches
Sainfoin	All cuttings: 1/2 to full bloom	4 inches	6 inches
Birdsfoot Trefoil	All cuttings: 1/10 bloom	3 inches	5 inches
Cicer milkvetch	All cuttings: 1/10 bloom	3 inches	5 inches

<sup>1</sup> For stand maintenance no grazing until after complete dormancy in the fall should be practiced.

<sup>2</sup> On late maturing warm season grasses, harvest a minimum of 6 weeks prior to killing frost.

<sup>3</sup> Do not cut alfalfa/clovers later than 4 weeks before average killing frost date.

<sup>4</sup> Definition of grass growth stages:

- a. Boot - most heads in upper leaf sheath but prior to emergence
- b. Early head - tips of head emerging on not more than 10 percent of the stems.
- c. Medium head - about 50 percent of the heads emerged or emerging.
- d. Full head - most heads emerged but prior to any flowering.

<sup>5</sup> A killing frost can be defined as when temperatures drop below 32 degrees F for an extended period of time (usually several hours) such that will kill vegetation. Temperature and duration will vary with plant species, as some plant species are more frost tolerant.