



**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**FORAGE AND BIOMASS PLANTING**

(Ac.)

**CODE 512**

**DEFINITION**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.

**PURPOSE**

- Improve or maintain livestock nutrition and/or health.
- Provide or increase forage supply during periods of low forage production.

Reduce soil erosion.

Improve soil and water quality.

Produce feedstock for biofuel or energy production

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies all lands suitable to the establishment of annual, biennial or perennial species for forage or biomass production. This practice does not apply to the establishment of annually planted and harvested food, fiber, or oilseed crops.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Select plant species and their cultivars based on:

- Climatic conditions, such as annual precipitation and its distribution, growing season length, temperature extremes and the USDA Plant Hardiness Zone.
- Soil condition and landscape position attributes such as; pH, available water holding capacity, aspect, slope, drainage class, fertility level, salinity, depth, flooding and ponding, and levels of phytotoxic elements that may be present.
- Resistance to disease and insects common to the site or location.

Follow recommendations for planting rates, methods and dates obtained from the plant materials program, land grant and research institutions, extension agencies, or agency field trials [such as "Cornell Guide for Integrated Field Crop Management"](#) or [VT Forages Home page \(see references\)](#).

Seeding rates will be calculated on a pure live seed (PLS) basis.

Plant at a depth appropriate for the seed size or plant material, while assuring uniform contact with soil.

Prepare the site to provide a medium that does not restrict plant emergence.

Plant when soil moisture is adequate for germination and establishment.

All seed and planting materials will meet [or exceed](#) state quality standards.

Do not plant federal, state, or local noxious species.

Apply all plant nutrients and/or soil amendments for establishment purposes according to a current soil test. Application rates, methods and dates are obtained from the plant materials program, land grant and research institutions, extension agencies, or agency field trials. [Required lime should be applied and incorporated at least six months prior to seeding. \(Allow longer than six months if no-till is planned\). Subsequent nutrient management will be according to a Nutrient Management Plan.](#)

When planting legumes, use pre-inoculated seed or inoculate with the proper viable strain of Rhizobia immediately before planting.

Exclude livestock until the plants are well established.

Select forage species based on the intended use, level of management, realistic yield estimates, maturity stage, and compatibility with other species. Verify plant adaptation to the area prior to planting.

Use conservation and no-till planting methods to establish forage plants on land subject to erosion, and/or to conserve soil moisture and organic matter.

For pesticide and herbicide use with planting (and for operation and maintenance) contact the Extension Service for current information and recommendations.

#### **Additional Criteria for Improving or Maintaining Livestock Nutrition and/or Health**

Use forage species that will meet the desired level of nutrition (quantity and quality) for the kind and class of the livestock to be fed.

Forage species planted as mixtures will exhibit similar palatability to avoid selective grazing.

#### **Additional Criteria for Providing or Increasing Forage Supply During Periods of Low Forage Production**

Select plants that will help meet livestock forage demand during times that normal farm/ranch forage production are not adequate.

#### **Additional Criteria for Reducing Erosion and Improving Water Quality.**

Ground cover and root mass need to be sufficient to protect the soil from wind and water erosion.

#### **Additional Criteria for Producing Feedstocks for Biofuel or Energy Production**

Select plants that provide adequate kinds and amount of plant materials needed.

### **CONSIDERATIONS**

In areas where animals congregate consider establishing persistent species that can tolerate close grazing and trampling.

Where wildlife and pollinator concerns exist, consider plant selection by using an approved habitat evaluation procedure.

Where air quality concerns exist consider using site preparation and planting techniques that will minimize airborne particulate matter generation and transport.

Where carbon sequestration is a goal, select deep-rooted perennial species that will increase underground carbon storage.



During and upon stand establishment planning and application of the following conservation practices should be considered as applicable; Forage and Biomass Harvest (511), Herbaceous Weed Control (315), Nutrient Management (590), and Prescribed Grazing (528).

Generally, pasture mixtures containing perennial legumes will produce higher yields and better forage quality than will pure stands of grass.

Bloat is a potential hazard when legumes are included in pasture mixes.

In most cases, pasture production will be increased more by proper management of existing stands of forage than by interseeding or reseeded. Longevity and persistence will be increased by rotational grazing systems that provide plant recovery periods and discourage selective grazing.

### **PLANS AND SPECIFICATIONS**

Prepare plans and specifications for the establishment planting for each site or management unit according to the Criteria, Considerations, and Operations and Maintenance described in this standard. Record them on a site specific job sheet or in the narrative of a conservation plan.

The following elements will be addressed in the plan to meet the intended purpose:

Site Preparation

Fertilizer Application (if applicable)

Seedbed/Planting Bed Preparation

Methods of Seeding/Planting

Time of Seeding/Planting

Selection of Species

Type of legume inoculant used (if applicable)

Seed/Plant Source

Seed Analysis

Rates of Seeding/Planting

Supplemental Water for Plant Establishment (if applicable)

Protection of Plantings (if applicable)

### **OPERATION AND MAINTENANCE**

Inspect and calibrate equipment prior to use. Continually monitor during planting to insure proper rate, distribution and depth of planting material is maintained.

Monitor new plantings for water stress. Depending on the severity of drought, water stress may require reducing weeds, early harvest of any companion crops, irrigating when possible, or replanting failed stands.

### **REFERENCES**

Ball, D.M., C.S. Hoveland, and G.D.Lacefield, 2007. Southern Forages, 4<sup>th</sup> Ed. International Plant Nutrition Institute, Norcross, GA.

Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages, The Science of Grassland Agriculture, 5<sup>th</sup> Ed. Iowa State University Press, Ames



United States Department of Agriculture, Natural Resources Conservation Service. 1997. National Range and Pasture handbook. Washington, DC.

USDA, NRCS. 2008. The PLANTS Database (<http://plants.usda.gov>, 08October 2008). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, NRCS. 2009. Technical Note 3. Planting and Managing Switchgrass as a Biomass Energy Crop.

<http://pss.uvm.edu/vtcrops>

<http://store.cornell.edu/c-875-pmep-guidelines.aspx> for "Cornell Guide for Integrated Field Crop Management".

<http://www.hort.purdue.edu/newcrop/afcm/index.html> Alternative field crops manual.