

## 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 and demand during periods of low forage production.
- Reduce soil erosion and improve soil and water quality.
- Produce feedstock for biofuel or energy production.

#### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to 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

Plant species and their cultivars shall be selected based upon:

- Climatic conditions, such as annual rainfall, seasonal rainfall patterns, growing season length, humidity levels, temperature extremes, and the USDA Plant Hardiness Zones.

- 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.

Recommended seeding/planting rates, methods of planting, and date of planting shall be consistent with documented guidance cited by plant materials program, research institutions, or agency demonstration trials.

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

Plant to proper depth ensuring seed or planting material will contact soil moisture uniformly.

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

Planting dates shall be scheduled during periods when soil moisture is adequate for germination and establishment.

All seed and planting materials shall meet 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.

When planting legumes, use pre-inoculated seed or inoculate with the proper viable strain

of Rhizobia immediately before planting.

Livestock shall be excluded 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 the planting.

If this practice has the potential to effect land managed under the USDA standards for organic production, then treatment alternatives must be included that meet standards for the National Organic Program (NOP).

<http://www.ams.usda.gov/AMSV1.nop>

Ultimately each cooperator is responsible for selecting and implementing an alternative that meets management objectives, including adherence to NOP standards or other guidelines that may apply.

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

Establish forage species that are most capable of meeting 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 Periods**

Select plants that will produce forage for use during periods when other on-farm/ranch forage does not meet livestock needs. Forage species selected shall balance or help balance the dry-matter demand of the animals for the desired period of time.

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

Plants shall provide adequate ground cover, canopy cover, root mass, and vegetative retardance to protect soil against 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. Manage plant material removal timing and intensity to favor plant health and soil quality factors.

Biomass removal can result in detrimental changes in many biological soil quality indicators including soil carbon, microbial activity, fungal biomass, and earthworm populations, indicating reduced soil function. Some disease-producing organisms are enhanced by biomass removal, others by retention, depending on crop and region. A routine monitoring system of soil quality factors must be a part of feedstock production. Mitigating measures will be implemented if a downward trend in soil quality indicators is detected.

To address the range of on-site environmental issues that can result from implementing this criterion, the NRCS Practice Code 590 Nutrient Management must also be fully adhered to on all lands where feedstocks are produced.

<http://efotg.nrcs.usda.gov/references/public/NM/590.pdf>

**CONSIDERATIONS**

In areas frequented by high density of animals, establish 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 such as the Kansas Wildlife Habitat Assessment Guide (KWHAG) or the Prairie Chicken Habitat Assessment.

Where air quality concerns exist, site preparation techniques should be utilized 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: 511, Forage and Biomass Harvest; 315,

Herbaceous Weed Control; 338, Prescribed Burning; 528, Prescribed Grazing; and 314, Brush Management. Conservation Practice 511, Forage and Biomass Harvest, may be used in combination with 512, Forage and Biomass Planting.

### **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 Inoculants 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**

The operator will inspect and calibrate equipment prior to use to ensure proper rate, distribution, and depth of planting material.

Growth of seedlings or sprigs shall be monitored 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.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management by

manipulating livestock type, stocking rates, density, and duration of stay.

Insects and diseases shall be controlled when an infestation threatens stand survival.

Evaluate forage stands each season or as needed to determine management inputs needed to achieve the desired purpose(s).

### **REFERENCES**

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