

**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.

capacity, aspect, slope, drainage class, fertility level, salinity, depth, flooding and ponding, and levels of elements present that may be toxic to either plants or animals.

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.

- Resistance to disease and insects common to the site or location.

Specified seeding/plant material rates, methods of planting, and date of planting shall be consistent with Missouri NRCS Agronomy Specification for Vegetation Establishment, Herbaceous Seeding 723 and documented guidance cited by NRCS plant materials program, land grant and research institutions and extension, or agency field trials for achieving satisfactory establishment.

Seeding rates will be calculated on a pure live seed (PLS) basis using JS-AGRON-25 or the current Missouri SeedRate Program.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on all lands suitable for 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.

Livestock shall be excluded until the plants are well established except that livestock, using a prescribed stock density and carefully controlled access, may be used to suppress undesired competition. Overgrazing of young plants is a danger; length of grazing periods must be limited to reduce selectivity.

CRITERIA

General Criteria Applicable to All Purposes

Plant species and cultivars shall be selected based upon:

- Climatic conditions, such as annual rainfall, seasonal rainfall patterns, growing season length, temperature extremes and USDA Plant Hardiness Zones.
- Soil condition and landscape position attributes such as Forage Suitability Group (FSG), pH, available water holding

To maintain legumes in a grazed pasture, plantings including legumes must be managed to provide adequate rest—40 to 45 days during summer. The grazing period must not exceed seven days during times of rapid growth and 14 days during periods of slow growth. A rotation system that provides the minimum period of rest and keeps grazing periods below the maximum is required.

Bermudagrass may not be planted north of I-70. Many seeded varieties lack sufficient cold tolerance, even for South Missouri; cold-tolerant sprigged varieties are usually the

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service or download the standard from the electronic Field Office Technical Guide for Missouri.

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better choice. Cold tolerance shall be a primary factor in variety selection. Bermudagrass will not yield well unless high rates of nitrogen fertilizer are applied; it should only be planted where there is access to large quantities of organic nitrogen (livestock manure for example) or where a thorough economic analysis supports long-term application of high rates of commercial nitrogen.

Old World bluestems are not recommended for planting north of I-70.

Southern crabgrass and annual lespedeza have very poor erosion control qualities, and they may not grow well in some years in response to adverse conditions. Reseeding annuals such as crabgrass and lespedeza may be planted in a mix with perennial species. The portion of such a mix made up of reseeding annuals may not exceed 35 percent.

Perennial ryegrass does not tolerate heat and drought well; it tends to be very short-lived in Missouri, even shorter-lived in South Missouri. It shall only be planted where forage of very high quality is essential for the intended purpose. Perennial ryegrass shall not exceed 35 percent of a mixture. Plans for frequent reseeding are typically wise.

Kura Clover is better adapted to North Missouri. It is slow to establish; including one pound of red clover in the mix will increase yields the first two years.

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

Establish forage species *and cultivars* 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.

Manage stock density to reduce selective grazing, or select forage species that have similar palatability for planting in mixtures.

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 when on-farm/ranch forage production are not adequate.

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

Plants shall provide adequate ground cover, canopy cover, root mass and vegetative retardance to protect 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. For switchgrass refer to Agronomy Technical Note MO-37, "Switchgrass for Biomass Production by Variety Selection and Establishment Methods for Missouri, Illinois, and Iowa."

CONSIDERATIONS

Establish persistent species that can tolerate close grazing and trampling in areas frequented by a high density of animals such as around water sources, loafing areas, and mineral or feeding locations.

Where wildlife and pollinator management is an objective, consider plant selection by using the Missouri Wildlife Habitat Appraisal Guide (MO-WHAG) or other approved habitat evaluation procedure. Refer to the practice standard for Upland Wildlife Habitat Management (645).

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 soil carbon storage.

Consider applying the following conservation practices during and after stand establishment: Forage and Biomass Harvest Management (511), Nutrient Management (590), and Prescribed Grazing (528).

PLANS AND SPECIFICATIONS

Specifications for the establishment of pasture and hay planting shall be prepared for each site or management unit according to the

Criteria and Considerations described in this standard and Missouri NRCS Agronomy Specification for Vegetation Establishment, Herbaceous Seeding 723, and shall be recorded on specification sheets, job sheets, in narrative statements in the conservation plan, or other acceptable documentation.

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

- Site Preparation
- Lime and Fertilizer Application (if applicable)
- Seedbed/Planting Bed Preparation
- Methods of Seeding/Planting
- Time of Seeding/Planting
- Selection of Species
- Type of legume inoculant (if applicable)
- Seed/Plant Source (if applicable)
- Seed Analysis
- Seeding/Planting Rates
- Protection of Plantings (if applicable)

OPERATION AND MAINTENANCE

Growth of seedlings or sprigs shall be monitored for water stress. Depending on severity, water stress may require reducing weeds, removal of livestock, early harvest of any companion crops, irrigating when possible, or replanting failed stands.

Invasion by undesirable plants shall be controlled by one or more of the following: cutting, using a selective herbicide, biological control methods, prescribed burning, or by grazing management including 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).

For post-establishment management follow criteria in the Prescribed Grazing (528) standard for grazed land and the Forage and Biomass Harvest Management (511) standard for land that is mechanically harvested.

Follow the criteria in the NUTRIENT MANAGEMENT (590) practice standard to apply fertilizer and lime for stand maintenance.

REFERENCES

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

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