

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.

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 state quality standards.

Do not plant federal, state, or local noxious species. As part of the routine stand maintenance plan to scout for noxious species and implement appropriate treatments.

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.

Exclude livestock until the plants are well

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [Field Office Technical Guide](#).

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.

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/AMSV1.0/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

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 minimize selective grazing or will be selected to allow foraging animals to self medicate to remediate nutritional deficiencies or internal parasite issues.

Plant materials will be selected for compatibility with other forage species and their selected cultivar(s) in rate of establishment, maturity, and growth habit when seeded together as a forage mixture.

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.

Plants shall have the ability to provide adequate ground cover, canopy cover, root mass, and vegetal retardance to wind forces and water flows either alone or in combination

with other forage species when site conditions require erosion protection.

Grazing and/or harvest management plans must be developed to assure adequate ground cover and root mass are available in the critical erosion periods.

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. non-removal or removal only during the dormant period may also adversely affect fungal biomass due to lack of carbon exchange between plant roots and mycorrhizal communities – Wardle. 2004. 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. These factors will include Soil Aggregate Stability, Soil Respiration, Soil Bulk Density and Infiltration rate on at least an annual basis. 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 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).

To ensure successful stands, chemical or mechanical weed control may be required.

Fall planting of cool season species is preferred.

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.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management by manipulating livestock stocking rates, density, and duration of stay.

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

REFERENCES

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