



Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
FORAGE AND BIOMASS PLANTING

CODE 512

(ac)

DEFINITION

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

PURPOSE

This practice is used to accomplish one or more of the following purposes—

- 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.

Use grass and legume species adapted to the soil conditions and adequate for the planned use. Guidelines and reference materials are available from the University of Connecticut (New England Perennial Forage Mixtures), Cornell University, and The Pennsylvania State University.

Specified seeding/plant material rates, methods of planting and date of planting shall be consistent with documented guidance cited by the University of Connecticut Cooperative Extension System (CES), Connecticut Agricultural Experiment (CAES), plant materials program, research institutions or agency demonstration trials for achieving satisfactory establishment. Retain copies of reference materials used.

No-till direct seedings may be used on all fields, however on sloping fields, use no-till methods of seeding to minimize soil loss. Prepare a field for no-till sod seedings a year in advance. Follow the guidelines “No-Tillage Seedings in Old Sod”, March, 1981, and “No-tillage Alfalfa Seedings into Corn Stubble Fields”, March, 1981, developed by R. A. Peters, Plant Science Department, University of Connecticut, or use other current information.

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.

Planting dates shall be scheduled during periods when soil moisture is adequate for germination and establishment. For most of Connecticut seeding dates are April 15 to June 15, and August 15 to September 15. In coastal areas where the growing season is longer, the fall seeding dates may be extended to October 1. Spring seedings may be established as early as April 1 if conditions permit.

Fertilizer and soil amendment recommendations shall be based on results of a current soil test from the University of Connecticut Soil Test Lab (UConn) or a laboratory whose criteria are recognized by UConn. Applications shall be appropriately placed and timed to be effective. The landowner shall record all applications of fertilizer and /or soil amendments and retain copies of soil tests and recommendations.

If needed, legume seed shall be inoculated with the proper species of viable Rhizobia before planting.

NOTE: Replanting alfalfa into a runout stand in the same field where the sod is killed should be avoided. The dying alfalfa roots release a toxin that retards seedling growth (allelopathy). The field should be planted to a small grain or corn for a year before reseeding to alfalfa.

If using coated seed, recalibrate the planting equipment to deliver the same number of seed per area as would be applied with non-coated seed.

Exclude livestock until the plants are well established.

All seed and planting materials will meet Connecticut Department of Agriculture quality standards.

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

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

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.

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; CT NRCS Standard 511, Forage and Biomass Harvest, 315, Herbaceous Weed Control, 633, Waste Utilization, 590, Nutrient Management, and 528, Prescribed 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, 4th Ed. International Plant Nutrition Institute, Norcross, GA.

Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages, The Science of Grassland Agriculture, 5th 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.