

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
FORAGE AND BIOMASS PLANTING

(Acre)

CODE 512

DEFINITION

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

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 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

Use of this standard will comply with all applicable federal, state, and local laws and regulations.

Plant species and their cultivars will be selected based upon:

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



- 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 toxic elements that may be present.
- Resistance to disease and insects common to the site or location.

Native plant species will be used whenever possible. Known invasive species will not be used.

Seedbed preparation, species selection (perennials, annuals, and biennials), seeding mixes, seeding rates, dates, depths, fertility

requirements, site adaptation and planting methods will be consistent with the requirements in the IN NRCS Seeding Tool.

Livestock will be excluded until the plants are well established.

Due to potential aggressiveness, reed canarygrass will not be recommended except where no other species will meet the intended purpose. Low-alkaloid varieties will be seeded when reed canarygrass is the desired forage species. Regardless of site, reed canarygrass **will be harvested or grazed prior to seed formation.** Monocultures of reed canarygrass will not be established.

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.

Perennial seeding mixes will have no less than 20% (dry matter) legume composition for grazing purposes.

Plant species and their cultivars will be selected based upon:

- the kind(s) of animal(s) using the forage,
- animal number,
- plant/ animal interactions and toxicity,
- grazing or harvesting intensity,
- height of grazing and harvesting and timing available to provide plants sufficient recovery.

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

Additional Criteria for Balancing the Forage Supply and Demand during 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 will help balance the dry matter demand of the animals for the desired period of time.

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

Selected plants will provide adequate ground cover, canopy cover, root mass and vegetative retardance to protect soil against wind and water erosion.

Minimum grazing heights will be maintained according to IN FOTG Standard (528) Prescribed Grazing and appropriate mowing heights and rest periods will be maintained according to IN FOTG Standard (511) Forage Harvest Management.

Harvest and grazing will be managed to reduce soil compaction and provide for stable or increased soil organic matter.

Additional Criteria to Increase Carbon Sequestration

For optimal carbon storage, select deep rooting, high carbon species that increase site biomass.

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 frequented by high density of animals, establish persistent species that can tolerate close grazing and trampling.

In fields which will receive multiple mowing passes each year, establish species that can tolerate the frequency and height of these cuttings.

Where wildlife and pollinator management is an objective select plant species and provide for other habitat requirements. To the extent practical, management practices and activities should not disturb cover during the primary nesting period of April 1 through August 1.

Where air quality concerns exist, site preparation techniques should be used that will minimize airborne particulate matter generation and transport.

Consider the following IN FOTG conservation practices, as applicable: (511) Forage and Biomass Harvest; (315) Herbaceous Weed

Control; (590) Nutrient Management; and (528) Prescribed Grazing.

Infected ryegrass pastures can cause staggers because of endophytic fungus infection of the forage. This is especially a problem with alpacas, horses and sheep, and occasionally cattle. Improved varieties of ryegrass are recommended.

Switchgrass can cause phototoxic reactions in horses. Switchgrass is not recommended for horses, sheep or goats because of associated alkaloids.

Low-endophyte, or preferably endophyte-friendly tall fescue varieties, should be used for optimal ruminant livestock rate of gain and production. Brood mares using tall fescue should only use endophyte friendly varieties because of high rate of birthing problems associated with endophyte infected tall fescues.

Pastures with clover over 40% by dry matter or 50% by visual estimates should be managed to prevent bloat. 30-40% legume content by dry matter basis is ideal for most pastures and should be maintained for forage quality and a nitrogen source for the grass.

Alsike clover is not recommended for horses because of photosensitization and liver problems.

High nitrogen fertilization during early spring can reduce magnesium availability and increase the chance of grass tetany.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. Plans will include the following:

- Plan view
- Species of plants to be established.
- Seeding rates.
- Seeding dates.
- Establishment procedure.
- Planned rates and timing of nutrient application.
- Other information pertinent to establishing and managing the species to be established.

Plans and specifications for the establishment and management of the species or species of plants to be established may be recorded in narrative form, on job sheets, or on other forms.

OPERATION AND MAINTENANCE

An operation and maintenance plan will be provided to and reviewed with the landowner. The plan will include the following items and others as appropriate.

- Fertilize to maintain a vigorous vegetative cover in the protected area. Caution should be used with fertilization to maintain water quality.
- Promptly repair eroded areas.
- Reestablish vegetative cover immediately where established stands have been lost.
- The operator will inspect and calibrate equipment prior to use to insure proper rate, distribution and depth of planting material.
- Growth of seedlings will be monitored for water stress and may require reducing weeds, early harvest companion crops, or irrigation if possible.
- Invasion by undesirable plants will 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 will 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

Forage Field Guide, 2nd Edition,

Purdue Extension Publication-ID-317, Purdue University, West Lafayette, IN; USDA , NRCS, Indianapolis, IN

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

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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.

Indiana (IN) Field Office Technical Guide (FOTG) Standard 528Prescribed Grazing Management-Intensive Grazing in Indiana, Purdue Extension Publication-AY328, Purdue University, West Lafayette, IN; USDA , NRCS, Indianapolis, IN

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