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 on 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 and 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.

In Alabama, plant approved forage or biomass species identified in Table 1. Warm Season Forage Crops Commonly Grown for Pasture and Hay in Alabama, Table 2. Cool Season Forage Crops Commonly Grown for Pasture and Hay in Alabama; and, the Geographical Areas for Species Adaptation and Seeding Dates, Figure 1 accompanying each table. Otherwise, consult with the grazing specialist for other planting guidance.

Adjust coated seed planting rates to account for the extra weight from coating on the seed.

Plant at a depth appropriate for the seed size or plant material and ensure 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.

Planting by conventional or no-till methods are acceptable. Planting methods shall provide a firm seed-bed that ensures good seed to soil contact. Prepare site to minimize weed pressure as much as possible before planting.

All seed and planting materials will meet state quality standards.

Do not plant species on federal, state, or locally recognized noxious plants lists.

Nutrient planning and application must be based on current soil manure, or organic by-products test results and recommendations developed in accordance with Alabama Cooperative Extension System (ACES) guidance. A soil test is considered current if soil samples are collected and tested within three years of the intended use date. Soil test analyses shall be conducted by Auburn University Soil Testing Laboratory or other laboratories that are accepted in The North American Proficiency Testing Program (Soil Science Society of America) program and accepted by the ACES. Recommendations developed outside the ACES guidance may be used if recognized by the ACES.

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

Keep inoculum under cool conditions as heat may kill the bacteria.

Select forage or biomass 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.

Exclude livestock until the plants are well established. Refer to Alabama NRCS conservation practice standard, Prescribed Grazing – Code 528 for information on when to begin grazing.

When an existing stand of vegetation is not compatible with the new stand, then existing stands of vegetation will be removed by mechanical or chemical means prior to establishment of the desired vegetation. For example, on an existing remnant stand of fungus infected fescue, existing stands of the grass will be destroyed and extra efforts, such as repeat herbicide applications or disking, will be used to destroy the existing seed bank. This process will likely cause a delay in the planting of the desired vegetation.

When a stand of forages needs improvement in density or species composition, e.g. adding white clover, over-seeding of desirable plant seed may be used. Graze or mow existing vegetation to at least a one-inch stubble prior to seeding. Prepare a seedbed by lightly disking, or other mechanical method to expose sufficient mineral soil for planting. Do not penetrate the sod more than 2 – 3 inches. Herbicides may be used to kill bands of vegetation before planting back into these bands. Apply fertilizer and lime according to soil test recommendations at or near the planting time.

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 produce forage for use during periods when other on-farm forage does not meet livestock needs. Forage species shall help balance the daily nutritional needs of the animals for the desired period of time.

Additional Criteria for Reducing Erosion and Improving Water Quality

Use plants that provide adequate ground cover, canopy cover, vegetative retardance and root mass needed to protect the soil from water erosion.

Additional Criteria for Producing Feedstock's for Biofuel or Energy Production

Select recommended plants that provide adequate kinds and amount of plant materials needed.

Additional Criteria for Planting Native Warm Season Grasses

Apply nutrients according to soil test results and recommendations. Do not apply nitrogen during the year of establishment. Refer to Alabama NRCS Job Sheet, Planting Native Grasses for Grazing Systems – No. AL512A.

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. Consider including native warm season grasses as part of the forage base. When possible, interseed or establish pollinator plants that provide benefits during spring, summer and fall.

Where air quality concerns exist consider using site preparation and planting techniques that will minimize airborne particulate matter generation and transport.

When carbon sequestration is a goal, select deep- rooted perennial species that will increase underground carbon storage.

During implementation of this standard, also consider implementing the following Alabama NRCS conservation practice standards:

- Forage and Biomass Harvest – Code 511
- Herbaceous Weed Control – Code 315
- Nutrient Management – Code 590
- Prescribed Grazing – Code 528

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, or other acceptable method of documentation.

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)

PLANTING

Conventional tillage may be used when erosion will not be a concern. When used, prepare a firm seedbed by rolling or using a cultipacker.

When soils are particularly erodible, Erodibility index >8, consider use of companion crops to protect the soil while desired plants are establishing.

Mulch tillage or No-till planting procedures should be considered when erosion is a primary concern. Site preparation herbicides should be used to reduce weed competition and aid in the establishment. These will also help minimize degradation of existing soil organic matter and health.

Plant approved forage species. Refer to Table 1. Warm Season Forage Crops Commonly Grown for Pasture and Hay in Alabama, and Table 2. Cool Season Forage Crops Commonly Grown for Pasture and Hay in Alabama. Choose species that best address resource concerns.

Weed control during the establishment period shall be done to ensure the survival of the new seedlings and promote sound growth. When herbicides are used for weed control, follow the herbicide labels and extension system recommendations. Consider adopting the Alabama NRCS conservation practice standards listed below.

- Brush Management – Code 314
- Herbaceous Weed Control – Code 315
- Integrated Pest Management – Code 595

Mowing should be considered to assist in reducing weed competition. It will assist in reducing the weed canopy and stimulate desirable grasses to tiller.

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. Drought stress may require controlling weeds, early harvest of any companion crops, irrigating when possible, or replanting failed stands.

Monitor competition from invasive or noxious weeds. Control as needed. Insects and diseases will be controlled when infestations threaten the survival of the stand.

Maintain fertility requirements for the success of this planting. Evaluate the stand composition to determine if planted species are being maintained or if reestablishment of some plant species is needed to achieve the desired purposes.

Consider implementing the following Alabama NRCS conservation practice standards as needed.

- Brush Management – Code 314

- Forage Harvest Management – 511
- Herbaceous Weed Control – Code 315
- Integrated Pest Management – Code 595
- Nutrient Management – Code 590
- Prescribed Grazing – Code 528

REFERENCES

Ball, D.M., C.S. Hoveland, and G.D.Lacefield, 2007. Southern Forages, 4th Ed. International Plant Nutrition Institute, Norcross, GA.

Alabama Planting Guides for Forage Grasses and Legumes, http://www.aces.edu/pubs/docs/A/ANR-0149/ANR-0149.pdf;

http://www.aces.edu/pubs/docs/A/ANR-0150/ANR-0150.pdf

USDA, Natural Resources Conservation Service. National Range and Pasture Handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/landuse/rangepasture/?cid=stelprdb1043084

The PLANTS Database, June 2014 (http://plants.usda.gov).

USDA, NRCS. 2009. Technical Note 3. Plantingand Managing Switchgrass as a Biomass EnergyCrop.