Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

PASTURE AND HAY PLANTING

CODE 512

(ac)

DEFINITION

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

PURPOSE

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

- Improve or maintain livestock nutrition and health
- Provide or increase forage supply during periods of low forage production
- Reduce soil erosion
- Improve water quality
- Improve air quality
- Improve soil health

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on all lands suitable for the one-time establishment of perennial species for forage production that will likely persist for 5 years. This practice does not apply to the establishment of annually planted and mechanically harvested food, fiber, or oilseed crops planted on designated cropland.

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 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 phytotoxic elements that may be present. Utilize ecological site description pasture states and forage suitability groups if available.
- Intended use, level of management, realistic yield estimates, stage of vegetative growth for planned harvest, and compatibility with other species.
- Resistance to disease and insects common to the site or location.

Refer to the *Maryland Conservation Planting Guide* for requirements concerning species selection, planting dates, rates, methods, and care in handling and planting of seed or planting stock. Refer to the Maryland NRCS fact sheet *Pasture and Hay Planting* for establishment and maintenance

recommendations. Recommendations obtained from the NRCS Plant Materials Program, University of Maryland Extension, and published research documents may also be applicable.

Calculate seeding rates to be consistent with State and local criteria.

Implement site preparation and seedbed preparation methods that avoid restricting plant emergence. Plant at a depth appropriate for the seed size or plant material, while assuring uniform contact with soil. Plant when soil moisture is adequate for germination and establishment.

Utilize seed and planting materials that will meet State quality standards. **Certified seed shall be used for all pasture and hay plantings.**

Do not plant Federal, State, or local noxious species. Avoid selecting species that are aggressive and may become weedy in nearby areas. Two species of particular concern in Maryland are: reed canarygrass (*Phalaris arundinacea*), a native species that can spread from plantings into natural wetlands and riparian areas; and bermudagrass (*Cynodon dactylon*), an introduced grass that can spread into other pasture plantings, lawns, and cropland fields. If there is concern for these species spreading into areas where they are not wanted, buffer strips, herbicides or other means of containment should be implemented.

Apply all plant nutrients and soil amendments for establishment purposes according to a current soil test taken within 3 years of the proposed planting date. The use of commercial fertilizer and other forms of plant nutrients must be in compliance with Maryland nutrient management regulations, as applicable, and shall meet the requirements of the Maryland conservation practice standard for Nutrient Management (Code 590).

When planting legumes, use preinoculated seed, inoculum coated seed, or inoculate with the proper viable strain of rhizobia immediately before planting.

Exclude livestock until the plants are well established. Ensure the plants have reached the full start grazing heights or the recommended hay cutting heights (late elongation phase or later) before the first grazing or cutting begins. See Maryland conservation practice standards for Prescribed Grazing (Code 528) and Forage Harvest Management (Code 511) for details. There may be conditions and time of the growing season that require letting the plants reach maturity before any haying or grazing takes place to avoid the risk of killing the new plants.

Select plants that will help meet livestock forage demand during times that normal forage production is not adequate.

Select plants that provide maximum ground cover for protection of the soil from wind and water erosion.

Additional Criteria for Improving or Maintaining Livestock Nutrition and 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 grazed or fed.

Select species mixtures with similar palatability to avoid selective grazing.

Select species with low or no toxic effects on grazing livestock.

Additional Criteria for Improving Water Quality

Use State and locally recommended species from the NRCS Plant Materials Program, *Maryland Conservation Planting Guide*, University of Maryland Extension, and other reputable scientific sources to support planting recommendations for reducing erosion and filtering runoff. When a seeding rate is expressed as a range (e.g., 5 to 10 pounds/acre), use the higher rate to provide greater stem density and resistance to water flow. As appropriate, add a nurse crop if needed to provide sufficient cover during plant establishment.

Additional Criteria for Improving Air Quality

Select deep rooted perennial plants that are recommended for sequestering carbon and reducing greenhouse gases. Use site preparation and planting techniques that minimize airborne particulate matter generation and transport.

Additional Criteria for Improving Soil Health

Minimize soil disturbance by using seedbed preparation and planting techniques, such as chemical burn-down and no-till drilling of forages, to protect soil aggregates. Nonchemical seedbed preparation methods that are low-disturbance can include soil spading, rototilling (set at reduced speeds with faster forward driving speeds), roller crimping, or timing planting to correspond with natural senescence of the preceding crop.

Planting a perennial with a specific nurse crop can quickly maximize ground cover during the establishment period.

Maximize biodiversity by selecting plants from at least two of the four functional groups (cool-season grass, cool-season broadleaf, warm-season grass, warm-season broadleaf).

Note: Specific programs may dictate criteria in addition to, or more restrictive than, those specified in this standard.

CONSIDERATIONS

For forage plantings, consider whether the planting will be used primarily for pasture (grazing) or hay (mechanically harvested). Some species are better adapted to a pasture-type management, where plants are harvested at specific vegetative stages or at relatively frequent intervals. Other species and varieties benefit from a hay-type management, where rest periods of 4 to 6 weeks are needed between harvests if stands and production are to be maintained.

For more intensively managed systems, consider species and varieties that are adaptable to both haying and grazing. Fields in these systems are usually hayed in late spring and grazed during the balance of the year.

Consider mixes, as opposed to single species stands, for the diversity of root systems and the benefits to soil health. A mix of grasses and legumes can live symbiotically and share nutrients (e.g., clovers and other legumes can provide nitrogen to grass plants). Having a variety of species also builds resiliency in the pasture, because a diverse mix is more likely to result in some plants growing despite varying conditions during the season. As a result, diverse pastures are usually more productive and higher in nutritional quality than monoculture pastures.

When planning mixtures, consider the relative maturity dates of plant species and varieties, their growth habits, and palatability for grazing or feeding. Select species and varieties that are expected to mature at approximately the same time.

In areas where animals congregate, consider establishing persistent species that can tolerate close grazing and trampling.

Follow criteria for protecting pasture plants and soil to promote soil health provided in the Maryland conservation practice standard for Prescribed Grazing (Code 528). This includes selecting appropriate plant species that increase deep rooting, soil carbon, and plant resiliency. Use native species if practicable.

For organic and transitioning-to-organic systems, all materials and methods used in the implementation of this conservation practice should comply with the National Organic Program Rules.

For the wildlife species of concern, select and plant species in a designated manner that will meet their cover and critical life cycle needs. Where wildlife and pollinator concerns exist, consider plant selection by

using an approved habitat evaluation procedure and by using native species if at all practicable. For pollinator needs, consider appropriate pollinator mixes for planting.

Consider the need for cool-season grass firebreaks when warm-season grass plantings are planned. Mature plantings of warm-season grasses can be flammable.

Refer to the Maryland conservation practice standard for Nutrient Management (Code 590) for details for managing nutrients.

Consider the need for additional Maryland conservation practices, such as Forage Harvest Management (Code 511), Herbaceous Weed Treatment (Code 315), and Prescribed Grazing (Code 528). These practices can be helpful in establishing and maintaining vigorous pasture and hay plantings.

For additional considerations, refer to the Maryland NRCS fact sheet *Pasture and Hay Planting*.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each site or management unit according to the requirements of this standard. Use the Maryland NRCS fact sheets *Pasture and Hay Planting*, *Cool-Season Grasses*, and *Warm-Season Grasses* to provide additional planting and establishment information, as applicable, and complete the 512 IR sheet. The IR sheet and appropriate fact sheet(s) can serve as the planting plan and specifications for implementing this practice.

Address the following elements in the plan to meet the intended purpose:

- Field number and acres.
- Species of plants to be established.
- Activities needed to prepare the planting area and the establishment procedure to be used.
- Seeding rates and depth of seeds planted.
- Seeding dates.
- Rates, timing, and forms of nutrient application and other soil amendments (if needed) from approved soil test analysis results and recommendations.
- Type of legume inoculant to be used (if applicable).
- Seed analysis (tag).
- All seed coating details (if applicable).
- Supplemental water for plant establishment (if applicable).
- Protection of plantings (if applicable), such as livestock exclusion periods and through use of Maryland conservation practice standards for Forage Harvest Management (Code 511) and Prescribed Grazing (Code 528), as needed.
- Description of successful establishment and when evaluation of establishment should be completed (e.g., minimum percent ground or canopy cover, percent stand, and stand density).

Supporting Data and Documentation

The following is a list of the minimum data and documentation to be recorded in the case file:

- Location of the practice on the conservation plan map.
- Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom.
- Completed IR sheet, and other specifications and management plans, as applicable.
- Certification of seed actually planted, including species, cultivar, germination, purity, and amount planted per acre. If available, include copies of seed tags, shipping invoices, or other documents that contain this information.

OPERATION AND MAINTENANCE

The operation and maintenance plan will include, as a minimum, the following requirements:

- Inspect and calibrate equipment prior to use.
- Continually monitor equipment during planting to ensure 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.
  - Monitor new plantings for prolonged wet conditions, which may cause failure of the plant establishment.
- Apply soil amendments periodically, based on soil test results, to meet desired yield goals, promote plant regrowth, and help maintain the life of the stand. The use of commercial fertilizer and other forms of plant nutrients must be in compliance with Maryland nutrient management regulations.
- Control undesirable plants by mowing or spraying with a selective herbicide. To the extent feasible, “spot” spray or mow to control weeds, so that desirable plants are not destroyed unnecessarily. Noxious weeds must be controlled as required by state law.
- Control insects and/or diseases when an infestation threatens stand survival. Follow a pest management plan concerning the timing and methods of treatment.
- When optimum wildlife habitat is desired, do not mow, burn, or mechanically harvest fields during the nesting season. For Maryland, the primary nesting season is April 15 through August 15. Infrequent grazing may be allowed during the primary nesting season, provided the area is not grazed below 6 to 8 inches. During the establishment period, mowing may be needed during the nesting season to reduce heavy competition from annual weeds.
- Describe the time of year or frequency of use restrictions, if any. *Pay particular attention to program requirements as they relate to acceptable vs. restricted uses and other management restrictions.*

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