

**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.
- 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 and weather are adequate for germination and establishment.

All seed and planting materials will meet state quality standards as denoted by the Pennsylvania Department of Agriculture.

Do not plant species classified as noxious and/or invasive by federal, state, or local government.

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.

Select plant species based on the intended use, level of management, realistic dry matter yield estimates for the area, 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.

Exclude livestock until the plants are well established.

Select plants that will help meet livestock forage need and/or producer's goals 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 water and wind erosion.

When planning to stockpile forage to extend the grazing season into fall/winter, select species and areas that will not increase erosion or create a water quality resource concern.

**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.

Consider longevity of species in meeting forage and biomass objectives.

Consider seeding erosion prone fields in strips across the slope over successive seeding windows to reduce soil erosion.

Consider planting using a reduce till method.

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.

For biomass production consider accessibility to processing equipment or processing plants.

Consider planting strategies that reduce or minimize energy inputs (e.g. proper size of farming equipment, use of nitrogen fixation by legumes).

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), Pest Management (595) and Prescribed Grazing (528).

**PLANS AND SPECIFICATIONS**

Prepare plans and specifications for the establishment planting for each site or management unit according to the Criteria, Considerations, and Operation 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:

- Selection of Species
- Seed/Plant Source
- Seed Analysis (germination test results)
- Rates of Seeding/Planting
- Type of legume inoculant used (if applicable)
- Time of Seeding/Planting
- Site Preparation
- Fertilization (if applicable)
- Seedbed/Planting Bed Preparation
- Methods of Seeding/Planting
- Supplemental Water for Plant Establishment (if applicable)
- Protection of Plantings (if applicable)

## OPERATION AND MAINTENANCE

Prepare an Operation and Maintenance (O&M) plan and review it with the producer. Specify that the practice will be inspected at least annually and after special events (e.g. weather, construction) to identify maintenance needs. As a minimum the plan will include:

- Monitoring of new plantings for water stress.
- Control of undesirable plants if their presence threatens the establishment or persistence of the stand. Or control/eradication of invasive species.
- Periodic checks to identify bare spots or eroded areas.
- Soil testing to address fertilization and pH issues.
- Field inspections to identify insect and diseases that could be threatening stand survival.

## REFERENCES

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