United States Department of Agriculture

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

TREE/SHRUB ESTABLISHMENT

CODE 612

(ac)

DEFINITION

Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.

PURPOSE

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

- Maintain or improve desirable plant diversity, productivity, and health by establishing woody plants
- Create or improve habitat for desired wildlife species compatible with ecological characteristics of the site
- Control erosion
- Improve water quality by reducing excess nutrients and other pollutants in runoff and groundwater
- Sequester and store carbon
- Restore or maintain native plant communities
- Conserve energy
- Provide for beneficial organisms and pollinators

CONDITIONS WHERE PRACTICE APPLIES

Tree/shrub establishment can be applied on any site capable of growing woody plants.

Utilize other practice standards for specialized tree/shrub establishment situations, e.g., Riparian Forest Buffer (391), Windbreak/Shelterbelt Establishment (380), or Critical Area Planting (342).

CRITERIA

General Criteria Applicable to All Purposes

Composition of species will be adapted to site conditions and suitable for the planned purpose(s).

No plants on the federal or state noxious weed list shall be planted.

Planting or seeding rates will be adequate to accomplish the planned purpose for the site.

Planting dates, and care in handling and planting of the seed, cuttings or seedlings will ensure that planted materials have an acceptable rate of survival.

Only viable, high-quality and adapted planting stock or seed will be used.

Appropriately prepared sites are a precondition for successful tree/shrub establishment.

Refer to Windbreak/Shelterbelt Establishment Tree Planting Procedures (380TPP), standard Tree/Shrub Site Preparation (490) for preparation of planting sites.

Adequate seed sources or advanced reproduction needs to be present or provided for when using natural regeneration to establish a stand.

Selection of planting technique and timing will be appropriate for the site and soil conditions.

The acceptability and timing of coppice regeneration shall be based on species, age and diameter.

The planting will be protected from plant and animal pests and fire. Refer to standard Integrated Pest Management (595) to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression.

Each site will be evaluated to determine if mulching, supplemental water or other cultural treatments (e.g., tree protection devices, shade cards, brush mats) will be needed to assure adequate survival and growth. Refer to standard Mulching (484) where appropriate.

Additional Criteria for Reducing Nutrients and Pollutants

Species used to treat waste shall have fast growth characteristics, extensive root systems, high nutrient uptake capacity and tolerance of the planned effluent.

Additional Criteria for Restoring or Maintaining Native Plant Communities

Composition of species selected for planting or those favored for natural regeneration will be native to the site and create a successional stage or state that can progress to the potential natural plant community. Refer to Restoration of Rare or Declining Natural Communities (643) for guidelines for restoring declining forest habitats.

Additional Criteria for Sequestering and Storing Carbon

The species and plant communities that attain biomass more quickly will sequester carbon faster. The rate of carbon sequestration is enhanced as trees and/or shrubs mature and soil organic matter increases. Select plants that have higher rates of growth and potential for carbon sequestration in biomass and are adapted to the site. Plant species at the appropriate stocking rate for the site. For short- term, rapid carbon sequestration, select species that have high-growth rates, recognizing that they are typically short-lived. For longer term storage of carbon, select plants with a long-life span, the ability to reach a large size, high-wood density, and potential for use in long-lived products. Establish and maintain a fully stocked stand.

Additional Criteria for Developing Renewable Energy Systems

Select plants that can provide adequate types and amounts of plant biomass to supply identified bioenergy needs.

Intensity and frequency of energy biomass removals will be managed to prevent long-term negative impacts on the system.

The harvesting of energy biomass shall be accomplished in a manner that will not compromise the other intended purpose(s) and functions.

Additional Criteria to Conserve Energy

Orient trees to shade a building to reduce summer energy usage. The first priority is placement on the building’s west side where the greatest daily heat gain occurs. The second priority is the east side.

Select plants with a potential height growth that will be taller than the structure or facility being protected.

Use proper plant densities to optimize the shade produced and meet energy reduction needs.

Trees planted within 30 to 50 feet of the building generally provide effective shade to windows and walls depending on tree height potential.

Keep trees at least 10 feet or further from the structure, depending on mature crown spread, to avoid damage to foundations or restrict maintenance access to windows and walls, and select species that develop deep root systems.

To protect structures from heat loss due to wind, refer to Windbreak/Shelterbelt Establishment (380)

Additional Criteria for Habitat for Beneficial Organisms

Plant trees and shrubs that provide habitat and food sources for beneficial organisms, such as pollinators, predatory and parasitic insects, spiders, insectivorous birds and bats, raptors, and terrestrial rodent predators. Select plant species that meet dietary, nesting, and cover requirements for the intended beneficial organisms during the critical period for control of target pests and, if possible, for the entire year.

Protect beneficial organisms from harmful pesticides.

CONSIDERATIONS

Priority should be given to plant materials that have been selected and tested in tree/shrub improvement programs. All plant materials should comply with minimum standards such as those as established by the American Nursery and Landscape Association, Nebraska Forest Service, or state-approved nursery.

Plans for landscape and beautification plantings should consider foliage color, season and color of flowering, and mature plant height.

Consider using diverse species combinations which best meet locally native wildlife and pollinator needs.

Consider the invasive potential when selecting plant species.

Tree/shrub arrangement and spacing should allow for and anticipate the need for future access lanes for purposes of stand management.

Residual chemical carryover should be evaluated prior to planting and alter species selection and/or timing of planting/seeding.

When underplanting, trees should be planted sufficiently in advance of overstory removal to ensure full establishment.

Consider establishing trees/shrubs through natural regeneration when seed or current tree/shrub reproduction is adequate to establish an acceptable stand in the time frame desired. Trees/shrubs must be desirable and meet the objectives of the customer and the appropriate criteria and considerations in this standard. Contact your local forester for assistance.

Existing or expected regeneration needs to be protected from domestic and/or wild animals, fire, logging, herbicide damage, etc.

Use locally adapted seed, seedlings or cuttings. Give priority to plant materials that have been selected and tested in tree/shrub improvement programs.

Where multiple species are available to accomplish the planned objective, consideration should be given to selecting species that best meet wildlife needs.

To minimize adverse offsite effects avoid designing tree cover that causes habitat fragmentation of intact grasslands needed by grassland nesting birds and other wildlife dependent on large expanses of contiguous grass habitat.

Species considered locally invasive or noxious shall not be used.

Species used to treat waste should have fast growth characteristics and extensive root systems, be capable of high nutrient uptake, and have the characteristic of producing wood/fiber products in short rotations.

For optimal carbon storage, select plant species that are adapted to the site to assure strong health and vigor and plant the full stocking rate for the site.

Considerations for Organic System During Vegetation Establishment

Natural mulches, such as wood products or hay, can be used to support tree/shrub establishment by controlling competing vegetation, as a viable alternative to using herbicides. Certified weed-free mulches are preferred. Refer to standard Mulching (484).

Pests may be managed through augmentation or introduction of predators or parasites and development of habitat for natural enemies of pests; non-synthetic controls such as lures, traps, and repellents may be used.

Invasive plant species may be controlled through mulching with fully biodegradable materials; mowing; livestock grazing with protection for plantings; hand weeding and mechanical cultivation; pre-irrigation; flame, heat, or electrical means. Use Prescribed Burning (338) as needed.

Considerations for Reducing Energy Use

Deciduous tree or shrub species planted to the south side of buildings can provide shade in the summer yet allow sun to reach the building in winter.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

Specifications/practice design will be based on this practice standard (612) and procedures found in the Tree/Shrub Design Procedures (612DP), Windbreak/Shelterbelt Establishment- Tree/Shrub Planting Procedures (380TPP), and Tree and Shrub Planting Plan Job Sheets (NE-CPA-15 and NE-CPA-15B). Site preparations will occur in accordance with practice standard Tree/Shrub Site Preparation (490) and Mulching (484) where appropriate.

As a minimum, specifications will contain the following data per the NE-CPA-15:

- Operator name, address, phone number
- NRD, county location, type of planting
- Conservation Tree/Shrub Suitability Group and soil name, based on soils on the site
- Area to be planted
- Planned weed control within and between tree/shrub rows
- Planned planting method(s) and date(s)
- The type of mulch (including fabric mulch) to be installed if mulch is being used
- Planned site preparation, including method utilized to eliminate aggressive dense sod- forming grasses
- Planned species to be planted in each row
- Spacing within and between each row planted
- Estimated number of each plant needed
- Actual number of plants planted
- Maps or drawings as needed to show location and site layout
- Who installed the plantings

- Signature and date(s) planted

Specifications for direct seeding methods will contain information detailed in Tree Planting Procedures (380TPP) and Tree and Shrub Establishment, Direct Seeding Job Sheet (NE- CPA-15B).

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance). Refer to Tree/Shrub Planting Procedures (380TPP) for detailed care and maintenance requirements.

Access by vehicles or equipment during or after tree/shrub establishment shall be controlled to protect new plants and minimize erosion, compaction and other site impacts. Refer to the standard Access Control (472).

The trees and shrubs will be inspected periodically and protected from adverse impacts including insects, diseases or competing vegetation, fire and damage from livestock or wildlife.

If needed, competing vegetation will be controlled until the woody plants are established. Noxious weeds will be controlled. Refer to standard Integrated Pest Management (595).

Replanting will be required when survival is inadequate. Refer to Nebraska Forestry Technical No. 63 for detailed replanting requirements.

Supplemental water will be provided as needed.

Periodic applications of nutrients may be needed where soil tests indicate nutrient deficiency. If nutrients are applied, refer to Nutrient Management (590).

After trees and/or shrubs are established, refer to the standards Forest Stand Improvement (666) and Tree/Shrub Pruning (660) for subsequent management.

REFERENCES

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Burns, R.M., and B.H. Honkala, tech. coords. 1990. Silvics of North America: 1. Conifers; 2. Hardwoods. Agriculture Handbook 654. USDA- Forest Service.

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McPherson, E. Gregory; Simpson, James R.; Perper, Paula J.; Maco, Scott E.; Gardner, Shelley L.; Cozad, Shauna K.; Xiao, Qingfu 2006. Midwest community tree guide:benefits, costs, and strategic planting. USDA Forest Service General Technical Report PSW-GTR- 199, p. 1-99.

Talbert, Cheryl. 2008. Achieving establishment success the first time. Tree Planters Notes, Vol. 52 No. 2 pages 31-37.

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