

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
TREE/SHRUB ESTABLISHMENT**

(Ac.)

CODE 612

DEFINITION

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

PURPOSES

Establish woody plants for:

- forest products such as timber, pulpwood, and energy biomass
- wildlife habitat
- long-term erosion control and improvement of water quality
- treating waste
- storing carbon in biomass
- reduce energy use
- develop renewable energy systems
- Improving or restoring natural diversity
- enhancing aesthetics

CONDITIONS WHERE PRACTICE APPLIES

Tree/shrub establishment can be applied on any appropriately prepared site where woody plants can be grown.

Utilize other practice standards for specialized tree/shrub establishment situations e.g., Riparian Forest Buffer (391), Alley Cropping (311), Windbreak/Shelterbelt (380), or Hedgerow Planting (422).

CRITERIA

General Criteria Applicable To All Purposes

Species composition will be adapted to the soils, climate and other site conditions; and suitable for the planned purpose(s).

Species considered locally invasive or noxious weeds will not be used.

Activities associated with “afforestation,” establishing new forests where none currently exist, and “reforestation,” re-establishing a forest after a harvest; including the timing and use of equipment will comply with guidelines contained in the current version of "Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines."

Each site will be evaluated to determine if supporting conservation practices are needed for site conditions such as the need for supplemental water (irrigation), weed control, risk of wildfire, livestock management or exclusion, cultural resource concerns or other cultural treatments.

The planting will be protected from weed competition until establishment is achieved. Refer to Integrated Pest Management (595) to assist with site-specific strategies for prevention, avoidance, monitoring and suppression of weeds and other undesirable plants.

Moisture conservation or supplemental watering shall be provided for plant establishment and growth where natural precipitation is too low for the selected species.

Plantings will avoid accumulating snow on roads and driveways and will not obstruct site lines at road intersections.

Avoid plantings where they will interfere with structures or any above or below ground utilities.

Where subsurface drains (tile lines) cross through a planting, non-perforated drain tile will be installed a minimum of 100 feet from large spreading trees such as cottonwoods, black willow, maples, oaks, elms, ashes, basswood and walnut and 75 feet from all other trees and shrubs.

Tree species will not be planted into sites where the existing cover consists of unplowed prairie unless the planting benefits restoration of the native ecology.

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Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact the MN NRCS in your area, or download it from the eFOTG for MN.

General Criteria - Site Preparation

A precondition for tree/shrub establishment is appropriately prepared sites. Refer to the practice Tree/Shrub Site Preparation (490) for more information.

Site preparation shall be sufficient for establishment, survival and growth of selected species.

General Criteria - Planting Stock

Use the appropriate type of stock for the purpose of the planting and site conditions. Types of stock include: bare-root, plugs, container, potted, whips, cuttings, poles, stakes, balled and burlap (B&B) or seeds.

Only viable, high quality and adapted planting stock or seed will be used. All planting stock will comply with the requirements of the current American Standard for Nursery Stock (ANSI Z60.1-2004) which can be found under Section I of the eFOTG.

Planting stock must be of known origin; meaning the origin of the plant material where the original plant or plant parts were collected (seeds, plants, or plant parts such as cuttings). This information should be on a tag attached to the plant or supplied by the vendor and should be copied on the job sheet or planning form, MN-ECS-002.

Protect seed stock from excess heat, freezing temperatures and desiccating winds while in storage and during planting.

General Criteria – Plant Spacing and Density

Spacing for linear or block plantings of trees and shrubs will follow the guidelines in the Specifications Sheet.

Plant spacing may vary within reasonable limits to accommodate recommended weed control measures, farm equipment or in-field obstructions. Document on the job sheet the in-row and/or between-row spacing and the reason(s) for differing from the guidelines in the specifications sheet.

Non-linear plantings such as direct seeding or natural regeneration use density, i.e. number of trees per acre, instead of spacing for planting rate criteria. Follow the guidelines in the specifications sheet for appropriate density rates.

General Criteria - Planting Dates

All plantings, other than direct seeding, will be completed in the spring as soon as the ground can

be worked and no later than June 1 with the following exception:

Hardwoods using potted, container, balled and burlap stock, and cuttings or whips may be planted from August 15 to September 15 on loamy soils if there is adequate moisture or sufficient moisture will be supplied. Late summer planting is unsuitable for all fine-textured and wet soils such as heavy loams or clays.

General Criteria – Plant Establishment

Choose a planting method that is appropriate for the stock type, site conditions and the purpose of the planting. Establishment methods include hand planting, machine planting, direct seeding, aerial seeding and natural regeneration.

The planting will be protected from browse damage as necessary. Document the expected browse damage vector, i.e. deer, and a potential damage assessment.

General Criteria – Survival Rates and Establishment

SURVIVAL RATES

Survival criterion is the minimum number or percentage of seedlings found alive during leaf out during the spring of the year after planting. Use Table 5 in the specification sheet to determine minimum survival rates by practice.

ESTABLISHMENT

Linear plantings

Establishment for linear plantings (refer to separate criterion for plantations below) will be measured 3 years after planting, following bud break. No two adjacent trees or shrubs within-row or between-rows are missing and 90% of the planted seedlings show new growth (bud break and/or healthy leaves or needles are growing).

For plantations (trees planted in rows, not windbreaks), survival will be at least 75% measured 3 years after planting.

All missing trees or shrubs will be replaced.

Non-linear plantings or broadcast seed

Establishment is measured on surviving plants 3 years after planting, following bud break.

A minimum of 75% of the crop trees or desired species show new growth, as above; or follow the guidelines in the specifications sheet for establishment criteria for specific plant

establishment methods; i.e. direct seeding, aerial seeding and natural regeneration.

General Criteria – Conservation Cover Crops

The need for permanent or temporary conservation cover will meet a documented natural resource concern.

General Criteria – Mulch

If using mulch, follow the guidelines in the practice Mulching (484).

Acceptable mulches, fabric, or mat materials must allow for water infiltration and air movement. Fabric mats will be a minimum of 3 feet by 3 feet in size and properly secured with pins or staples. Manufactured fabrics and tree mats must have a serviceable lifespan of at least 36 months.

When organic mulches are used the material shall be a minimum 4 inches deep with at least a 2 foot wide radius around the seedling. Organic mulches should be kept at least 6 inches away from the main stem of trees and shrubs to discourage adverse feeding and damage by mice and rodents.

Additional Criteria for Wildlife Habitat

The wildlife specie(s) for this purpose will be identified.

Refer to the specifications sheet for guidelines on establishing wildlife habitats.

Refer to Table 6, “Native Trees and Shrubs Beneficial to Upland Wildlife” in the specifications sheet for species recommended by eco-region for wildlife purposes.

BLOCK PLANTINGS FOR WILDLIFE

Establish dense tree and shrub blocks, clumps or under-plantings, a minimum of 2 to a maximum of 5 acres in size, as appropriate.

Block plantings will consist of a minimum of 10 rows unless physically constrained by on-site conditions. A typical 10 row block planting will consist of:

- 1) 2 rows of shrubs planted on the windward side of the planting;
- 2) The next 4 rows will consist of tall deciduous trees;
- 3) Followed by a minimum of 4 rows of conifers planted on the down-wind side.

Avoid tall deciduous trees in designs adjacent to food plots.

MIXED SPECIES PLANTINGS FOR WILDLIFE

Refer to the practice Restoration and Management of Declining Habitats (643) for more information.

Plantings consisting of native hardwoods and conifers, to be established in historically forested landscapes, shall have a minimum of 300 stems per acre and a maximum of 550 stems per acre at establishment.

Additional Criteria for Developing Renewable Energy Systems

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

Table 7 in the specifications sheet lists recommended Hybrid Poplar clones for Minnesota.

Other species possible for energy biomass include but are not limited to: willows, cottonwoods, aspens, silver maple, ashes, boxelder and alder.

Additional Criteria for Treating Waste

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

Recommended tree species for this purpose are hybrid poplar and aspens (*Populus* spp.) and hybrid willows (*Salix* spp.). Other species of known waste treatment benefits may be used and must be documented.

Waste includes biosolids, animal waste, excess fertilizers, metals, petroleum products and pesticides.

Use a minimum spacing of 10 X 6 or 725 trees per acre. Direct seeding and natural regeneration will not be used for this purpose.

Additional Criteria for Storing Carbon in Biomass

Select plants that are adapted to the site and establish at the appropriate planting or seeding rate recommended for maximum carbon storage rates.

Use Conservation Tree and Shrub Groups in Section II of the FOTG to determine appropriate species; and Tables 1, 2 or 3 in the specifications sheet as appropriate for seeding or planting rates.

Additional Criteria for Improving or Restoring Natural Diversity

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 the section Additional Criteria for Natural Regeneration in this standard for more information.

To determine species composition, use the Conservation Tree and Shrub Groups or other appropriate guides.

Additional Criteria to Reduce Energy Use

Refer to the practice Windbreak/Shelterbelt Establishment (380) for criteria for this purpose.

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, Forest Service or state-approved nursery.

The seedlings of white and black spruce, tamarack and red, jack, and white pines, developed by the Minnesota Tree Improvement Cooperative, show improved height growth, stem form and/or disease resistance. Use these plant materials as appropriate.

Refer to MN-ECS Plant Materials Technical Note #4 (1997) for information on certified seedlings.

Where pesticide spray drift from adjacent cropland could adversely affect plants, establish a 10-foot wide tall grass barrier adjacent to and immediately upwind of the planting. Use the practices Filter Strip (393), Field Border (386), or Hedgerow Planting (422), as appropriate, to intercept pesticide spray drift.

Where water erosion or runoff from melting snow is a hazard use supporting conservation practices. These practices could include but are not limited to: Grassed Waterway (412), Critical Area Planting (342), Diversion (362), Structure for Water Control (587).

When planting companion trees for training growth, such as for oaks, avoid these fast growing trees as training trees to avoid overtopping and suppressing the slower growing oak: ash, silver maple, black cherry and walnut.

Tree/shrub arrangement and spacing should allow for and anticipate the need for future access lanes, skid trails and log landings for purposes of stand management activities.

PLANS AND SPECIFICATIONS

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

Documentation shall specify the requirements for installing the practice, such as the kind, amount or quality of materials to be used, or the timing or sequence of installation activities. Requirements for operation and maintenance of the practice shall be incorporated into site specifications.

OPERATION AND MAINTENANCE

The guidelines below and in the attached job sheet, "Operation and Maintenance Plan" must be followed. These required criteria include normal repetitive activities in the application and use of the practice (operation) and repair and upkeep of the practice (maintenance).

The planting shall be inspected on a periodic basis, and at least annually.

Replace and or replant seedlings when survival is inadequate. Refer to Table 5 in the specification sheet for more information.

Maintain one central leader (stem) on trees in all linear plantings by pruning forks and multiple leaders within 3 years after planting. Follow the guidelines in the practice Tree/Shrub Pruning (660).

Herbaceous and woody weeds and vegetative competition will be controlled until the crop trees, shrubs or desirable species are established. Follow the guidelines in the practice Integrated Pest Management (595).

Insect and disease outbreaks will be monitored and controlled as necessary. Follow the guidelines in the Practice Standards Integrated Pest Management (595); Tree/Shrub Pruning (660) or Forest Stand Improvement (666).

Apply recommended nutrients as per a developed nutrient management plan following the guidelines in the practice Nutrient Management (590).

Follow the guidelines in the practice Access Control (472) to manage livestock as necessary to achieve and maintain the intended purpose.

As applicable, control of water or concentrated flow erosion shall be maintained. Following severe storms check for evidence of sediment deposit, erosion or concentrated flow channels.

After the trees and/or shrubs are established, refer to the practices Forest Stand Improvement (666), Tree/Shrub Pruning (660), Windbreak/Shelterbelt Renovation (655) or other suitable practices for subsequent management.

REFERENCES

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