

# TREE/SHRUB ESTABLISHMENT

(Acre)  
Code 612

Natural Resources Conservation Service  
Conservation Practice Standard

## I. Definition

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

## II. Purpose

This practice may be applied as part of a conservation management system to support one or more of the following purposes. Establish woody plants for:

- forest products such as timber, pulpwood, etc.,
- wildlife habitat,
- long-term erosion control and improvement of water quality,
- treating waste,
- storing carbon in biomass,
- reducing energy use,
- developing renewable energy systems,
- improving or restoring natural diversity,
- enhancing aesthetics,
- reducing air pollution, and
- uptake of soil and water-borne chemicals and nutrients.

## III. Conditions Where Practice Applies

This practice applies in open fields, in under stocked woodland, beneath less desirable tree species, or on other areas suited for woody plants.

Utilize other Wisconsin NRCS Field Office Technical Guide (FOTG) practice standards for specialized tree/shrub establishment situations, e.g., Riparian Forest Buffer, 391; Alley Cropping, 311; Windbreak/Shelterbelt Establishment, 380; Critical Area Planting, 342; Hedgerow Planting, 422.

## IV. Federal, Tribal, State, and Local Laws

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements governing tree/shrub establishment. This standard does not contain the text of federal, tribal, state, or local laws.

## V. Criteria

### A. General Criteria Applicable to All Purposes

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

Species considered locally invasive or noxious will not be used.

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. Trees/shrubs will be planted in early spring as weather permits. Seeding will be done in the season most suitable for germination.

For direct seeding and planting techniques, species selection, care of seedlings and equipment, see Wisconsin Forestry Technical Note 1, Tree and Shrub Establishment - Native Tree and Shrub Planting Recommendations For Wisconsin.

Only viable, high quality, and adapted planting stock or seed will be used. Planting stock and seed sources from within the Lake States Region are recommended.

A precondition for tree/shrub establishment is appropriately prepared sites. Refer to Wisconsin NRCS FOTG Section IV Standard 490, Forest Site Preparation. In areas where brush, sod, or weeds may cause severe competition for moisture, it may be necessary to reduce competing vegetation by:

- Scalping with attachment on planter, or by hand.
- Furrowing or strip tillage with a plow, disk, or similar implement.

- Chemically treating areas of heavy sod or application of a pre-emergent herbicide is needed based on weed history for the site. This method eliminates the need for scalping or furrowing, leaving the soil surface undisturbed, a critical factor on erodible sites or soils with thin surface layers.
- Applying mulch, fabric, or similar weed barriers.

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 stem/trunk diameter.

The planting will be protected from plant and animal pests and fire. Refer to Wisconsin NRCS FOTG Section IV Standard 595, Integrated Pest Management, to assist with site-specific strategies for pest prevention, pest avoidance, pest monitoring, and pest suppression.

The planting will be protected from adverse impacts from livestock, including grazing or trampling.

Firebreaks and access roads will be provided as needed.

Control of deer, rabbit, gopher, and mouse damage may be needed to ensure establishment by:

- The use of chemical repellants applied to trees/shrubs or soil.
- Mechanical protection, such as wire or plastic enclosures, wrapping, etc.
- Controlling weeds that can harbor animals.
- Protecting or providing habitat for predators such as hawks, owls, coyotes, etc.
  - Avoiding especially palatable tree/shrub species in areas of high animal pest concentration.

Cover crops or critical area plantings may need to be established to protect the soil surface until trees/shrubs are established and provide canopy closure.

On very wet sites subject to ponding or flooding, plant on prepared ridges to prevent drown-out. Ridging should be done a year ahead of planting. Use hand planting on “cradle-knolls” on heavy soils, where suitable. Direct seeding is an option in fall on sites that are usually too wet for planting in spring.

Divert or filter runoff from barnyards, manure disposal facilities and crop fields to prevent damage to trees and shrubs.

#### **B. Additional Criteria for Treating Waste**

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

#### **C. 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.

#### **D. Additional Criteria for Storing Carbon in Biomass**

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.

#### **E. Additional Criteria for Developing Renewable Energy Systems**

Select plants that can provide adequate kinds 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.

## F. Additional Criteria to Reduce Energy Use

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 ft of the building generally provide effective shade to windows and walls depending on tree height potential.

Keep trees at least 10 ft or further from the structure depending on mature crown spread, to avoid damage to foundations or restrict maintenance access to windows and walls.

## VI. Considerations

Additional recommendations relating to design that may enhance the use of, or avoid problems with, this practice but are not required to ensure its basic conservation functions are as follows.

- A. 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.
- B. All planting stock and seed should be purchased from nurseries that are known to be using locally adapted seed, seedlings or cuttings (Lake States Origin). Southern seed sources are seldom hardy in Wisconsin.
- C. Plans for plantings to enhance aesthetics should consider foliage color, season and color of flowering, and mature plant height.
- D. Consider using diverse species combinations which best meet locally native wildlife and pollinator needs.
- E. Tree/shrub arrangement and spacing should allow for and anticipate the need for future access lanes for purposes of stand management. Density will vary with species, intent of the

planting, method of planting, soil site conditions and other factors.

- F. Plantings for erosion control and reforestation are generally less than or equal to 1,100 stems per acre for transplants and 3,000 first year germinates for direct seeding.
- G. Residual chemical carryover should be evaluated prior to planting and alter species selection and/or timing of planting/seeding.
- H. When under planting, trees should be planted sufficiently in advance of overstory removal to ensure full establishment.
- I. Treat active gullies before planting. Seeds or seedlings will be planted no closer than 50 feet to grassed channels.
- J. Prescribed burning may be required for natural regeneration of serotinous cone species and for site preparation for other species.

## VII. Plans and Specifications

Specifications for applying this practice shall be prepared for each site and recorded in the conservation plan using Wisconsin Job Sheet 143, Tree/Shrub Planting, and Wisconsin Forestry Technical Note 1, Tree and Shrub Establishment - Native Tree and Shrub Planting Recommendations For Wisconsin.

Documentation will include:

- site preparation requirements,
- tree/shrub species planned,
- spacing,
- number of trees/shrubs per acre or seeding rates,
- purpose of planting,
- planting or seeding methods,
- cultural practices,
- maintenance requirements,
- and location on the conservation plan map.

## VIII. Operation and Maintenance

An operation and maintenance plan shall be developed that is consistent with the purpose of this practice, intended life of the components, and criteria for design.

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 Wisconsin NRCS FOTG Section IV Standard 472, Access Control.

If needed, competing vegetation will be controlled until the woody plants are established. Noxious weeds will be controlled. Refer to Wisconsin NRCS FOTG Section IV Standards 315, Herbaceous Weed Control; and 314, Brush Management.

**Note: The first three years after planting/seeding are critical for successful establishment.**

Replanting will be required when survival is inadequate. For most plantings/seedings, a minimum acceptable survival rate the third year after planting/seeding is 70%. Specialty plantings such as windbreaks and shelterbelts require 100% survival to be functional.

Supplemental water will be provided as needed.

Periodic applications of nutrients may be needed to maintain plant vigor. If nutrients are applied, refer to Wisconsin NRCS FOTG Section IV Standard 595, Nutrient Management.

After trees and/or shrubs are established, refer to Wisconsin NRCS FOTG Section IV Standards 666, Forest Stand Improvement; and 660, Tree/Shrub Pruning, for subsequent management.

## **IX. References**

USDA, NRCS Wisconsin Field Office Technical Guide (FOTG), Section IV, Practice Standards and Specifications.

USDA, NRCS, Wisconsin Forestry Technical Note 1, Tree and Shrub Establishment - Native Tree and Shrub Planting Recommendations For Wisconsin.

USDA, NRCS, Wisconsin Job Sheet 143, Tree Planting.

Talbert, Cheryl 2008. Achieving Establishment Success the First Time. Tree Planters Notes, Vol. 52 No. 2, pages 31-37.

Smith, David Martyn, 1962. The Practice of Silviculture. 578 pp.

U.S. Department of Agriculture Forest Service, 1990. Agriculture Handbook No. 654, Silvics Volume 1: Conifers and Volume 2: Hardwoods.

Stoddard, Charles H., 1968. Essentials of Forestry Practice. 362 pp.