NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WINDBREAK/SHELTERBELT ESTABLISHMENT

(Ft.)

CODE 380

DEFINITION

Windbreaks or shelterbelts are multiple rows of trees or shrubs in linear configurations.

PURPOSE

- Reduce soil erosion from wind.
- Protect plants from wind related damage.
- Alter the microenvironment for enhancing plant growth.
- Manage snow deposition.
- Provide shelter for structures, animals, and people.
- Enhance wildlife habitat.
- Provide noise screens.
- Provide visual screens.
- Improve air quality by reducing and intercepting air borne particulate matter, chemicals and odors.
- Delineate property and field boundaries.
- Improve sprinkler irrigation efficiency.
- Increase carbon storage in biomass and soils.

CONDITIONS WHERE PRACTICE APPLIES

Apply this practice on any areas where linear plantings of woody plants are desired and suited for the purposes listed above. Use other tree/shrub practices when these purposes are not concerns.

CRITERIA

General Criteria Applicable To All Purposes

The location, layout and density of the planting will accomplish the purpose and function intended within a 20-year period.

The maximum design height (H) for the windbreak or shelterbelt shall be the expected height of the tallest row of trees or shrubs at age 20 for the given site.

Species must be adapted to the soils, climate, site conditions, and suited to the intended purpose/use.

Only viable, high-quality planting stock will be used.

Spacing between individual plants shall be based on the needed growing space for plant type and species, the accommodation of maintenance equipment, and the desired characteristics of the

stem(s), branches and canopy as required for a specific purpose.

The windbreak will be oriented as close to perpendicular to the troublesome wind as possible.

The length of the windbreak will be sufficient to protect the site including consideration for the “end effect” and changes in wind direction.

Avoid planting trees or shrubs where they will interfere with structures and above or below ground utilities.

Site preparation shall be sufficient for establishment and growth of the selected species, not contribute to erosion and be appropriate 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. Proper care of planting stock will be taken from pickup through planting.

Moisture conservation or supplemental watering shall be provided for plant establishment and growth where 1) natural precipitation is too low for the selected species or 2) annual precipitation is less than 25”.

Species considered locally invasive, noxious, or that may be alternate hosts or attractants to undesirable pests shall not be used.

Windbreak density will be designed to achieve the intended purpose or meet the concern.

Additional Criteria to Reduce Wind Erosion and Protect Growing Plants

The interval between windbreaks shall be determined using current, approved, wind erosion technology. Interval widths shall not exceed that permitted by the soil loss tolerance (T), or other planned soil loss objective. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Manage Snow Deposition

Windbreaks may be designed and installed to manage either snow distribution or accumulation. The effective density will be designed for the expected snow-producing months.

Where property lines allow, windbreak lengths will extend beyond each side of the area being protected to keep snowdrifts caused by end effects from extending into the area being protected.

Windbreaks will be located so that snow deposition will not pose a health or safety problem, management constraints, or obstruct human, livestock or vehicular traffic.

Supporting practices shall be used for controlling water erosion and/or runoff from melting snow, where applicable.

Additional Criteria to Provide Shelter for Structures, Livestock and People

Drainage of snowmelt from the windbreak shall not flow across the livestock area.

Drainage of livestock waste from the livestock area shall not flow into the windbreak.

Additional Criteria for Noise Screens

Noise screen densities shall be designed for the time of the year when noise is a problem, as tall as, and as close to the noise source as practicable.

Species selected will be tolerant to noxious emissions, sand, gravel depositions or salt spray from traffic areas.

Additional Criteria for Visual Screens

Visual screens shall be located as close to the observer as possible with a density, height and width to sufficiently block the view between the area of concern and the sensitive area.

Additional Criteria for Improving Air Quality by Reducing and Intercepting Air Borne Particulate Matter, Chemicals and Odors.

Select and maintain tree and shrub species with foliar and structural characteristics to optimize interception, and absorption of airborne chemicals or odors.

Additional Criteria for Increasing Carbon Storage in Biomass and Soils

Maximize width and length of the windbreak to fit the site.

For optimal carbon sequestration, select plants that have higher rates of sequestration in biomass and soils.

Establish and manage the appropriate plant spacing for the site that will maximize above and below ground biomass production

Minimize soil disturbance during establishment and maintenance of the windbreak/shelterbelt.

Additional Criteria for Enhancing Wildlife Habitat.

Plant species selection shall benefit targeted wildlife species.

Design dimensions of the planting shall be adequate for targeted wildlife species.

Corridor plantings will be designed to connect beneficial wildlife habitats.

Additional Criteria for Improving Irrigation Efficiency

For sprinkler irrigation systems, the windbreak shall be taller than the spray height.

The windbreak shall not interfere with the operation of the irrigation system.

CONSIDERATIONS

Consider enhancing aesthetics by using evergreen species or species with features such as showy flowers, brilliant fall foliage, or persistent colorful fruits.

When designing and locating a windbreak or shelterbelt, consider the impact upon the landowner's or public's view of the landscape.

Selection of plants for use in windbreaks should favor species or varieties tolerant to herbicides used in the area.

Wildlife needs should be considered when selecting tree or shrub species. Species diversity, including use of native species, should be considered.

Species diversity, including use of native species, should be considered to avoid loss of function due to species-specific pests.

Windbreaks for odor and chemical control increase in effectiveness as the amount of foliage available for intercept increases. Multiple row, wide plantings offer greater interception potential than do smaller plantings.

When using trees and shrubs for greenhouse gas reductions, prediction of carbon sequestration rates should be made using current, approved carbon sequestration modeling technology.

In cropping systems select windbreak and shelterbelt species that minimize adverse affects to crop growth (e.g. shade, allelopathy, competing root systems or root sprouts).

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.

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).

Replacement of dead trees or shrubs will be continued until the windbreak/shelterbelt is functional.

Supplemental water will be provided as needed, particularly in areas receiving less than 25” of annual precipitation.

Thin or prune the windbreak/shelterbelt to maintain its function.

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

Periodic applications of nutrients may be needed to maintain plant vigor.

APPROVAL AND CERTIFICATION

WINDBREAK ESTABLISHMENT (AC)

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PRACTICE SPECIFICATIONS APPROVED:

/s/ **Ray Stoner**	**2/15/200**8
State Staff Forester	Date
/s/ **Susan Baggett**	**2/15/2008**
State Resource Conservationist	Date

These practice specifications are needed in the _____ Field Office Technical Guide

District Conservationist	Date