

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD AND SPECIFICATIONS**

HERBACEOUS WIND BARRIERS

(Feet)
CODE 603

DEFINITION

Herbaceous vegetation established in rows or narrow strips in the field across the prevailing wind direction.

PURPOSES

- Reduce soil erosion and/or particulate generation from wind.
- Protect growing crops from damage by wind-borne soil particles.
- Manage snow to increase plant available moisture.
- Provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland or other land where crops are grown.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Vegetation Barriers may consist of perennial or annual vegetation, growing or dead. Plant materials shall be selected for the following characteristics:

- Adaptation to local soil and climate conditions.
- Stiff, erect non-spreading growth habit.
- Resistant to lodging.
- Good leaf retention.
- Minimum competition with adjacent crops.

The establishment of perennial herbaceous vegetation will be based on the CRITICAL AREA PLANTING (342) conservation practice standard. The establishment of annual herbaceous vegetation will be based on the

COVER AND GREEN MANURE CROP (340) conservation practice standard. Refer to locally accepted University Extension agronomy guides for adapted variety information and management recommendations.

Number of Rows Barriers may consist of one row of plants, providing the required porosity can be achieved with a single row and that the row contains no gaps. More than one row shall be planned for each barrier on sites such as sandy soils that negatively affect the establishment or survival of the barrier.

Where two or more rows are required to achieve the required porosity and to avoid gaps, the rows shall be spaced no more than 36 inches apart.

Barrier Direction and Spacing The effective spacing between barriers shall be determined using current approved wind erosion prediction technology. When barrier directions deviate from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced by multiplying the planned spacing times the reduction factors in Table 1. Use interpolation methods to determine values for angles that are not listed.

Spacing Reduction Factors

Angle of Deviation from Perpendicular	Spacing Reduction Factor
0°	1.00
22.5°	0.93
45°	0.71
67.5°	0.38
90°	Not feasible

Barrier Height Harvest of hay or seed from perennial barriers, grazing or mowing for weed control shall be managed to allow regrowth to the planned height before periods when wind erosion, crop damage, or drifting snow are expected to occur. Annual barriers will be managed to achieve sufficient height and condition to meet their intended purpose.

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Calculating Porosity The number of rows of vegetation needed to achieve the required porosity shall be determined using the most current wind erosion prediction technology.

Additional Criteria to Reduce Soil Erosion and/or Particulate Generation from Wind

Barrier Height Barriers designed for this purpose shall have a minimum expected height of 1.5 feet during the wind erosion period for which the barriers are designed.

Barrier Porosity Barriers established for this purpose shall be designed to achieve a porosity of 40 to 50 percent.

Barrier Direction and Spacing The spacing between barriers shall be measured along the prevailing wind erosion direction during those periods when wind erosion is expected to occur. Spacing shall not exceed 10 times the expected height of the barrier plus additional width permitted by the soil loss tolerance (T) or other planned soil loss objective.

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced using factors from Table 1.

Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Protect Growing Crops from Damage from Wind-borne Soil Particles

Barrier Height Barriers designed for this purpose shall have a minimum expected height of 0.5 feet during those periods when growing crops are susceptible to damage by wind or wind-borne soil particles. The designed height of the barrier will depend on the distance between the barrier and the crop being protected and the crop height at which it will no longer need the protection of the barrier.

Barrier Porosity Barriers established for this purpose shall be designed to achieve a porosity of 40 to 50 percent during the period when growing crops are to be protected.

Barrier Direction and Spacing

The spacing between barriers shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. Spacing shall not exceed 10 times the expected height of the barrier plus additional width permitted by the crop tolerance to wind erosion as specified in applicable Field Office Technical Guides or other planned crop protection objectives. Crop tolerance to wind erosion is the maximum rate of soil blowing that crop plants can tolerate without significant damage due to abrasion, burial, or desiccation.

The spacing between barriers shall be determined using current approved wind erosion prediction technology to estimate wind erosion during specific cropstage periods. Calculations shall account for the effects of other practices in the conservation management system.

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced using factors from Table 1.

Additional Criteria to Manage Snow to Retain Additional Soil Moisture

Barrier Height Barriers designed for this purpose shall have a minimum expected height of 1.5 feet during periods of expected snow cover.

Barrier Porosity Barriers established for this purpose shall be designed to achieve a porosity of 60 to 75 percent during periods of expected snow cover.

Barrier Direction and Spacing The effective spacing shall be measured along the direction of prevailing winds during periods of expected snow cover. For uniform distribution of drifting snow, spacing shall not exceed 12 times the expected height of the barrier.

When barrier direction deviates from perpendicular to the prevailing wind direction, the spacing between barriers shall be correspondingly reduced using values from Table 1.

Additional Criteria to Provide Food and Cover for Wildlife

Vegetation Barriers established for this purpose shall consist of plants that provide food and cover for the targeted wildlife species. Select species that are adapted to the site and meet the intended needs of desired wildlife species.

Barrier Width Barriers established for this purpose shall have a minimum width of six feet.

Barrier Height Barriers established for this purpose shall have a minimum expected height of 1.5 feet to provide adequate cover for the targeted wildlife species.

CONSIDERATIONS

Transport of wind-borne sediment and sediment-borne contaminants offsite are reduced by this practice when used in a conservation management system.

Herbaceous wind barriers are more suitable than field windbreaks for use under center pivot irrigation systems due to height considerations. Windbreaks may be located outside the windward edge of the circle.

Spacing between barriers will be adjusted, within the limits of the criteria above, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Selection of plants for use in barriers should favor species or varieties tolerant to herbicides used on adjacent crops.

Plants which may be alternate hosts for pests injurious to adjacent crops should not be selected for use in barriers. Select plants that serve as a home for beneficial insects or pest predators. Barriers may be planned as trap strips to attract undesirable insects.

Selection of plant species less palatable to animals may reduce potential damage to barriers from wildlife and still provide desired benefits for targeted species.

Where water erosion from melting snow, accumulated within the barrier system, is a concern, supporting erosion control practices such as residue management can reduce the

hazard. Where feasible, aligning barriers across the slope can enhance moisture infiltration and reduce erosion.

When barriers are designed to enhance wildlife habitat, plant species diversity and complexity should be encouraged. Barriers that result in multiple structural levels of vegetation within the barrier will maximize wildlife use. Wide, multi-row barriers offer wildlife better cover and protection from predators.

If the barrier is designed to provide escape or nesting cover for wildlife, locate barriers where they connect areas of existing perennial vegetation whenever possible. Barriers that connect areas such as woody draws often provide additional escape and travel cover. Stiff stems are important in providing cover during severe winter storms.

Encourage the use of adapted native plant materials whenever possible.

Use species that sequester more carbon or increase the width of the barrier to improve carbon sequestration.

PLANS AND SPECIFICATIONS

Site specification for establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Site specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Annual barriers shall be re-established each year by planting at recommended dates, leaving rows standing after crop harvest, or leaving standing strips when incorporating a cover crop into the soil.

Gaps in perennial barriers shall be replanted as soon as practical to maintain barrier effectiveness.

After establishment, perennial barriers shall be fertilized at the same time and rate as adjacent field crops or as needed by the barriers.

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Weeds shall be controlled with cultivation, mowing, chemicals, or other acceptable methods. Pesticides will be selected that are compatible with the perennial barriers and crops grown and with local wildlife concerns.

Wind-borne sediment accumulated in barriers shall be removed and distributed over the surface of the field as determined appropriate.

Barriers shall be re-established or relocated as needed.

Barriers designed to enhance wildlife habitat should not be mowed or pruned unless their height or width exceeds that required to achieve the wildlife objective or they become competitive with the adjoining land use. When mowing or pruning is necessary, it shall be done during the non-nesting season.

PRESCRIBED BURNING (338) may be planned and applied to enhance plant vigor when completed after the nesting periods and early enough to allow regrowth prior to anticipated wind erosion.