NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

HERBACEOUS WIND BARRIERS

(Ft.)

CODE 603

DEFINITION

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

PURPOSE

- 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

Vegetation. Criteria for the establishment of perennial herbaceous vegetation shall be made from guidelines developed locally (provide in specifications) or referenced in the Field Office Technical Guide (FOTG).

Refer to the Washington and Oregon Guide for Conservation Seedings and Plantings, USDA-NRCS, April 2000, or other approved guides for species selection and planting rates.
Herbaceous wind barriers may be composed 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.

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.

When 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 deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced. (See table 502-3 of the National Agronomy Manual, 3rd Ed., June 2000, for adjustment factors).

Calculating Porosity. The number of rows of vegetation needed to achieve the required porosity listed in this standard shall be determined using the most current wind erosion technology. State Agronomists shall provide field offices with calculations or tables as needed in their state.

Harvest. 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 so barriers are of sufficient height and condition to meet their intended purpose.

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 40-50 percent.

Barrier Direction and Spacing. The spacing between barriers shall be measured along the prevailing wind erosion direction during the critical wind erosion period (s) being planned for on the field. 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. Calculations shall account for the effects of other practices in the conservation 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 a barrier.

Barrier Porosity. Barriers established for this purpose shall be designed to achieve a porosity of 40-50 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 damage from wind erosion (*) as specified in applicable Field Office Technical Guides, other accepted technical references, or other planned crop protection objective.

*Crop tolerance to damage from wind erosion is the maximum soil erosion that a growing crop can tolerate, from crop emergence to field stabilization, without an economic loss to crop stand, crop yield or crop quality.

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

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 period of expected snow cover.

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

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

Additional Criteria to Provide Food and Cover for Wildlife

Vegetation. Barriers are often designed to enhance wildlife habitat in conjunction with one of the other purposes. Select barrier species that are adapted to the site and that meet the intended needs of the targeted wildlife species.

CONSIDERATIONS

Transport of wind-borne sediment and sediment-borne contaminants offsite are reduced by this practice when used in a resource 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 may 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.

Certain plants may be alternate hosts for pests injurious to adjacent crops and may not be satisfactory for use in barriers. Consider plants that serve as a home for beneficial, pest-eating insects, pollinators and pest predators. Consider planning barriers as trap strips to attract undesirable insects such as virus spreading aphids.

Selection of plant species less palatable to animals may reduce damage to barriers from grazing wildlife.

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 should be encouraged. Barriers that result in multiple structural levels of vegetation within the barrier will maximize wildlife use.

If the barrier is also designed to provide escape or nesting cover for wildlife, locate barriers where they connect areas of existing perennial vegetation whenever possible and include plants that will have a minimum expected height that provides adequate cover for the targeted species. Barriers that connect areas such as woody draws often provide additional escape and travel cover. Two or more rows are often more effective than one row, with a minimum width of two feet between rows. Stiff stems are important in providing cover during severe winter storms.

Encourage the use of adapted native plant materials whenever possible.

Consider using species of plants that sequester more carbon and/or increasing the width of the herbaceous barrier to improve carbon sequestration.

PLANS AND SPECIFICATIONS

Plans and specifications for the establishment and maintenance of this practice shall be prepared for each field or treatment unit according to the Conditions, Criteria and Operation & Maintenance described in this standard.

Specifications shall be recorded using approved specification sheet 603, job sheets and narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AN MAINTENANCE

Annual barriers shall be re-established each year by planting at recommended dates, leaving rows standing and maintained throughout the critical period for which the barrier was designed.

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

After establishment, perennial barriers shall be fertilized as needed. Weeds shall be controlled by cultivation, spot treatment when using chemicals, or other acceptable methods.

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 composed of perennial vegetation that are designed to enhance wildlife habitat should not be mowed unless their height or width exceeds that required to achieve the barrier purpose, or they become competitive with the adjoining land use. When mowing is necessary, it shall be done during the non-nesting season.

Prescribed Burning (338) to enhance plant vigor may be completed after nesting/resting periods.