

**NATURAL RESOURCES CONSERVATION SERVICE
MONTANA CONSERVATION PRACTICE SPECIFICATION**

HERBACEOUS WIND BARRIERS (FEET)

CODE 603

DEFINITION: A herbaceous wind barrier consisting of living or dead vegetation established in rows or narrow strips in the field across the prevailing wind direction.

PURPOSE: As part of a resource management system, herbaceous wind barriers will support practices that reduce soil erosion by wind, reduce soil particulate emissions to the air, protect growing crops from damage by wind borne soil particles, manage snow to increase plant available moisture.

RESOURCE MANAGEMENT SYSTEM: Herbaceous wind barriers are established as part of a resource management system to address the soil, water, air, plant, animal, and human needs as related to the owner's goals and objectives. It is important to consider crop rotation, nutrient and pest management, and other supportive conservation practices when designing a wind erosion reduction system.

Background. This practice can be used on land eroding by wind erosion where crops or forage are grown. This practice will typically not resolve wind erosion problems by itself, but must be used in conjunction with other practices such as residue management, conservation tillage, crop rotation, etc.

When designing a wind erosion reduction system, predicted soil losses using the design system must be less than or meet the tolerable level established for the design soil map unit.

Design. Vegetation utilized in this practice must be strong enough to withstand the force of wind without breaking during critical periods. Barriers may be composed of annual or perennial vegetation, living or dead. However, vegetation selected must be adapted to the local soil and climatic site, be stiff, erect and be of a non-spreading growth habit, resist breaking or lodging, have good leaf retention, and provide minimal competition with adjacent crops.

The porosity of the barriers needs to be such that air velocity is reduced to undamaging speeds, but not necessarily completely stopped. Different crops have different abilities to withstand damage by winds and blowing soil. The following table identifies crop tolerance to blowing soil.

TABLE 1. Crop Tolerance to Blowing Soil

TOLERANT "T"	MODERATE TOLERANCE 2 TONS/ACRE	LOW TOLERANCE 1 TON/ACRE	VERY LOW TOLERANCE 0 TO 0.5 TONS/ACRE
Barley	Alfalfa (mature)	Broccoli	Alfalfa seedlings
Buckwheat	Corn	Cabbage	Asparagus
Flax	Onions (>30 days)	Asparagus	Cantaloupe
Grain Sorghum	Orchard crops	Cucumbers	Carrots
Millet	Soybeans	Garlic	Celery
Oats	Sunflowers	Green/snap beans	Flowers
Rye	Sweet Corn	Peas	Sugar beets
Wheat		Potatoes	Most other vegetables

Also consider selecting species that are not invasive.

Establishment. Barriers may be established to provide protection as growing vegetation or as dead vegetation. Species may be annual or perennial types. When establishing barriers, proper seedbed preparation is necessary. The following general guidelines should be followed as a minimum to ensure success germination. Additional methods, based on site-specific conditions, may be necessary.

SEEDBED PREPARATION:

Provide a firm, weed-free seedbed that:

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- Ensures seed will contact soil moisture uniformly (seed to soil contact).
- Facilitates seedling emergence.
- Provides a medium that does not restrict or allow roots to become dry.
- Eliminates seedling competition from weedy species.
- Provides a seedbed that is sufficiently firm.

Number of Rows. Barrier may consist of one or more rows that provide the required porosity or density designed to protect crops. On sandy sites, multiple rows will normally be required. When multiple rows are required they should be spaced no further than 36 inches apart.

Barrier Direction and Spacing. The effective spacing and direction of the barriers should be designed so that wind erosion is reduced to tolerable limits of the crop/forage being protected (see TABLE 1 above). For best results barriers should be oriented perpendicular to the prevailing winds during seedling periods. When this orientation is not possible, spacing between barriers should be reduced.

Porosity. Barriers designed to reduce wind erosion shall be established to achieve a porosity of 40-50%. Barriers designed to protect crops from damage from blowing soil shall be established to achieve a porosity of 40-50%. Barriers designed to manage snow to retain additional soil moisture shall be established to achieve a porosity of 60-75%.

Barrier height. To be most effective, barriers designed to reduce wind erosion shall be established to achieve a height of 1.5 feet during the design wind erosion period. Barriers designed to protect crops from damage from blowing soil shall be established to achieve a height of at least 0.5 feet during those periods when growing crops are susceptible to damage. Barriers designed to manage snow to retain additional soil moisture shall be established to achieve a minimum height of 1.5 feet.

Other considerations. Herbaceous wind barriers may be more suitable than field windbreaks to use under irrigation pivots due to height concerns. Barrier widths may need to be adjusted, within the criteria listed above, to accommodate widths of farm machinery to minimize partial or incomplete passes. In most cases, species should be selected that is resistant to herbicides used on adjacent crops. Supporting practices that enhance the herbaceous barriers may be needed to completely treat all concerns of the resource.

OPERATION AND MAINTENANCE:

Maintenance must be carried out to insure that this practice functions as intended. These actions include normal activities in the application and use of the practice and repair and maintenance of the practice.

1. Annual barriers shall be re-established each year by planting at recommended dates, leaving rows standing and maintaining throughout the critical period for which the barrier was designed.
2. Gaps in perennial barriers shall be re-established as soon as practical to maintain barrier effectiveness.
3. After establishment, barriers will be fertilized as needed. Weeds shall be controlled by cultivation and spot treatment when using chemicals.
4. Wind-borne sediment accumulated in barriers shall be removed and distributed over the surface of the field.
5. Barriers composed of perennial vegetation that are designed to enhance wildlife habitats should not be mowed unless their height or width exceeds that required to achieve the barrier purpose, or they become competitive with adjoining crops/forage. When mowing is necessary, it shall be done during the non-nesting season.