

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARDS**

**CROSS WIND TRAP STRIPS
(acre)
CODE 589C**

DEFINITION

Herbaceous cover resistant to wind erosion, established in one or more strips across the prevailing wind erosion direction.

PURPOSE

- Reduce soil erosion from wind.
- Induce deposition and reduce transport of wind-borne sediment and sediment-borne contaminants downwind.
- Protect growing crops from damage by wind-borne soil particles.
- Provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland susceptible to wind erosion.

CRITERIA

General Criteria Applicable To All Purposes Named Above

Number of Strips: A cross wind trap strip system shall consist of one or more strips across the prevailing wind erosion direction. This practice may also serve as a component of a conservation system that includes Stripcropping (589); Herbaceous Wind Barriers (603); or Windbreak/Shelterbelt Establishment (380).

Width of Trap Strips: Trap strips shall be wide enough to trap saltating soil particles and store wind-borne sediments originating upwind.

The width of the trap strips shall be at least 15 feet, when vegetation or stubble in the strip will normally be one foot or more in height during periods when wind erosion is expected to occur.

The minimum width of the trap strip shall be at least 25 feet when the effective height of the vegetation or stubble in the strip will normally be less than one foot during periods when wind erosion is expected to occur.

Vegetative Cover: Trap strips may consist of perennial or annual plants, growing or dead. Plant materials shall be selected for the following characteristics:

- Adaptation to the site.
- Erect during wind erosion periods.
- Tolerant to sediment deposition.
- Ability to withstand snow drifting
- Compatibility to secondary purposes (i.e. provide wildlife food and cover)

Criteria for the establishment of perennial herbaceous vegetation will be based on procedures in practice standard Conservation Cover (327) in the Field Office Technical Guide. Select species and seed mixtures for perennial trap strips using the attached Table 1.

Refer to locally accepted university or extension agronomy guides, or other accepted technical references for criteria to establish annual herbaceous vegetation that will be utilized for trap strips.

Additional Criteria to Reduce Soil Erosion from Wind

Location of Trap Strips: Trap strips established for this purpose shall be located as follows:

- At the windward edge of fields; or
- Immediately upwind from areas within fields to be protected from erosion or deposition; or
- In recurring patterns interspersed between erosion-susceptible strips.

NRCS-Minnesota
February 2007

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact the MN Natural Resources Conservation Service in your area, or download it from the electronic Field Office Technical Guide for Minnesota

Direction and Width of Erosion-Susceptible

Strips: The effective width of strips shall be measured along the prevailing wind erosion direction during those periods when wind erosion is expected to occur. It shall not exceed the width determined to keep potential soil erosion below the established soil loss tolerance (T).

When the direction of strips deviates from being perpendicular to the prevailing wind erosion direction, the width of the erosion-susceptible strips shall be correspondingly reduced so that soil loss tolerance (T) is not exceeded.

Strip orientation shall not result in an angle of deviation that exceeds 45 degrees during the management period(s) when wind erosion is expected to occur. The angle of deviation is the angle between an imaginary line perpendicular to the long dimension of the strip and the prevailing wind erosion direction.

The width of strips shall be determined using current approved wind erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Induce Deposition and Reduce Transport Of Wind-borne Sediment and Sediment-borne Contaminants Downwind

Location of Trap Strips: Trap strips shall be established immediately upwind from areas to be protected from sediment deposition. There shall be no erosion-exposed area located between the trap strip and the area to be protected from sediment deposition.

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

Location of Trap Strips: Trap strips shall be established immediately upwind from areas used for sensitive crops. There shall be no erosion-exposed area located between the trap strip and the crop to be protected.

Direction and Width of Strips of Sensitive Crops:

The effective width shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. It shall not exceed the width permitted by the crop tolerance to wind erosion* as specified in Field Office

Technical Guide, other accepted technical references, or other planned crop protection objectives.

*Crop tolerance to wind erosion is the maximum rate of blowing soil that crop plants can tolerate without significant damage due to abrasion, burial, or desiccation.

When the direction of strip deviates from being perpendicular to the prevailing wind erosion direction, the width of strips planted to sensitive crops shall be correspondingly reduced so that estimated soil loss does not exceed crop tolerance.

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

Additional Criteria to Provide Food and Cover for Wildlife

Vegetative Cover: Trap strips shall consist of vegetation that provides food and/or cover for the targeted wildlife species. Refer to practice standard Upland Wildlife Habitat Management (645) for recommended species and seeding mixtures.

Width of Cross Wind Trap Strip: The minimum width for this purpose is 30 feet.

Trap Strip Height: Trap strips designed for this purpose shall have a minimum expected height of 1.5 to 3.0 feet to provide adequate cover for wildlife species.

CONSIDERATIONS

The effectiveness of Cross Wind Trap Strips is maximized when strips are oriented as close to perpendicular as possible to the prevailing wind erosion direction for the period for which the system is designed.

Selection of plants for use in trap strips should favor species or varieties tolerant to herbicides used on adjacent crops or other land uses.

When trap strips are designed to enhance wildlife habitat, plant species diversity within the strip should be encouraged. Trap strips that result in multiple structural levels of vegetation within the strip will maximize wildlife use.

Some plants are damaged by blowing wind as well as by wind-borne sediment. In such cases, the spacing between trap strips may have to be reduced from that obtained using wind erosion prediction technology.

Drifting snow or grazing by wildlife may reduce the trapping capability of trap strips. In such cases, other conservation practices, including the residue management practices; Stripcropping (589), Herbaceous Wind Barriers (603), or Windbreak/Shelterbelt Establishment (380) may be used with, or as alternatives to, trap strips to achieve the conservation objective.

PLANS AND SPECIFICATIONS

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

Specifications shall be recorded using narrative statements in the conservation plan, and on approved specification sheets, or job sheets.

OPERATION AND MAINTENANCE

After establishment, perennial trap strips shall be fertilized as needed to maintain plant vigor. Weeds shall be controlled with mowing or herbicides.

Mowing or grazing of trap strips shall be managed to allow regrowth to the planned height before periods when wind erosion or crop damage is expected to occur.

Wind-borne sediment accumulated in trap strips shall be removed when these accumulations exceed 6 inches in depth and distributed over the surface of the field as determined appropriate. Following removal of sediment accumulation or other vegetative cover disturbance, reseed disturbed areas to the original plant species.

Trap strips shall be re-established or relocated as needed to maintain plant density and height.

When barriers are designed to enhance wildlife habitat, they shall not be mowed or pruned unless their height and width exceeds that required to obtain the wildlife objective or they become competitive with the adjoining land use. When

mowing or pruning is necessary, it shall be done only during non-nesting season.

REFERENCE

National Agronomy Manual, Third Edition, October 2002, Part 502 - Wind Erosion.

Specifications

TABLE 1: Species Components For Designing Cross Wind Trap Strip Seed Mixtures

Species	COLUMN A	COLUMN B	Plant Species Adaptability		Salts ²	pHRange	Longevity ³	Effec.Ht ⁴
	% of Mixture Permitted	Seeding Rate as Single Species - PLS Lbs/Ac	Drought	Flooding ¹				
<u>Introduced Grasses:</u>								
Smooth Bromegrass	0-100	14	Good	Fair	Good	5.5-7.5	Long	>12
Timothy*	0-25	4	Poor	Good	Fair	5.5-7.5	Short	>12
Tall Fescue*	0-50	8	Good	Fair	Good	5.5-7.5	Moderate	>12
Creeping Foxtail*5/	0-100	3	Poor	Excel	Poor	5.5-7.5	Long	>12
Redtop	0-100	3	Fair	Good	Fair	4.0-7.5	Moderate	>12
Tall Wheatgrass*	0-50	22	Poor	Good	Excel	6.5-8.5	Moderate	>12
Intermediate Wheatgrass*	0-50	20	Fair	Fair	Fair	6.5-8.5	Moderate	>12
Russian Wildrye*	0-33	10	Good	Fair	Good	6.5-8.5	Moderate	>12
<u>Native Grasses:</u>								
Whitetop ⁵	100	5	Poor	Excel	Good	6.5-8.5	Long	>12
Canada Wildrye	0-10	12	Good	Fair	Good	6.5-7.5	Short	>12
Slender Wheatgrass*	0-10	8	Good	Good	Excel	6.5-8.5	Short	<12
Western Wheatgrass*	0-50	16	Good	Good	Excel	6.5-8.5	Long	>12
Big Bluestem*	0-50	8	Fair	Poor	Poor	5.5-7.5	Long	>12
Indiangrass*	0-25	8	Fair	Poor	Poor	5.5-7.5	Long	>12
Switchgrass*	0-100	5	Good	Fair	Fair	5.0-7.5	Long	>12
Little Bluestem*	0-25	8	Good	None	Fair	5.0-7.5	Long	>12
Sideoats Grama*	0-25	8	Good	None	Fair	5.0-7.5	Long	<12
<u>Legumes:</u>								
Alfalfa*	0-50	12	Good	Poor	Fair	6.2-7.5	Moderate	>12
Red Clover*	0-33	9	Fair	Fair	Poor	5.5-7.5	Short	<12
Alsike Clover	0-25	2	Poor	Good	Poor	4.0-7.5	Short	<12

* Variety selection is important for this species. Select an adapted variety using information from practice standard Conservation Cover (327) or current edition of Minnesota Varietal Trials of Selected Farm Crops.

¹ Flooding Ratings - None <1 Week; Poor 1-2 Weeks; Fair 2-4 Weeks; Good 4-6 Weeks; Excellent >6 Week.

² Soluble Salts Ratings - Poor 0-2 mmhos; Fair 3-4 mmhos; Good 5-7 mmhos; Excellent 8-16 mmhos.

³ Longevity - Short 1-4 Years; Moderate 5-10 Years; Long >10 Years.

⁴ Effective Height of previous years residue during the spring erosion period.

⁵ Limit use of these species to sites with high water table and seasonally flooded.

HOW TO USE TABLE 1:

Take the total seeding rate as a single species from COLUMN B and multiply that number by the percent of the total seed mixture desired for each species in the planned mixture. The answer is the seeding rate for each species in the mixture. The result after all computations is the seed mixture planned. The percent values for all species in the mixture must total 100%. The composition for any single species can not exceed the permitted percent shown COLUMN A.

Example 1: Desired seeding mixture is alfalfa (40%), smooth brome grass (40%), and tall fescue (20%). Seeding mixture would be alfalfa 4.8 lbs (12 lbs total X 40% = 4.8 lbs); brome grass 5.6 lbs (14 lbs total x 40% = 5.6 lbs); and tall fescue 1.6 lbs (8 lbs total x 20% = 1.6 lbs). Total pounds of seed per acre would be 12 (4.8+5.6+1.6=12).

Example 2: Desired seeding mixture is switchgrass (50%); big bluestem (40%); and Indiangrass (10%). Seeding mixture would be switchgrass 2.5 lbs (5 lbs total X 50% = 2.5 lbs); big bluestem 3.2 lbs (8 lbs total X 40% = 3.2 lbs); and Indiangrass 0.8 lb (8 lbs total X 10% = 0.8 lb). Total pounds of seed per acre would be 6.5 pounds (2.5+3.2+0.8=6.5).