

Cross Wind Trap Strips (Acre) 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 or other land susceptible to wind erosion.

CRITERIA

General Criteria Applicable to All Purposes

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 Conservation Practice Standards 589B, Cross Wind Stripcropping; 603, Herbaceous Wind Barriers; or 380, Windbreak/Shelterbelt Establishment.

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

The minimum width of trap strips is determined as follows during periods when wind erosion or plant damage is expected to occur:

- 15 feet when the effective height of the planned vegetation or stubble in the strip is normally one foot or more
- 25 feet when the effective height of the planned vegetation or stubble in the strip is normally less than one foot.

Vegetative Cover. Trap strips may consist of perennial or annual plants, growing or dead. Vegetation may consist of warm season or cool season grasses, legumes or legume-grass mixtures that meet the following criteria. Select Plant materials 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).

For perennial herbaceous vegetation, follow establishment procedures in practice specification 589C. See Table 1 Cross Wind Trap Strip Alternatives for the species mixtures and seeding rates that are approved for Cross Wind Trap Strip Use.

For annual herbaceous vegetation, refer to locally accepted university or extension agronomy guides or other accepted technical references. See the MSUE Bulletin E-2107 Seeding Practices for Michigan Crops for planting specification guidance.

Additional Criteria to Reduce Soil Erosion from Wind

Location of Trap Strips. Locate Trap strips established for this purpose as follows:

- At the windward edge of fields; or

- Immediately upwind from areas to be protected from erosion or deposition; or
- In recurring patterns interspersed between erosion-susceptible strips.

Direction and Width of Erosion-Susceptible Strips for wind erosion control. Determine the effective width of strips along the prevailing wind direction during those periods when wind erosion is expected to occur.

Plan trap strips width using E tables for your location found in the MI NRCS Electronic Field Office Technical Guide (eFOTG), Section 1 Wind Erosion Prediction or the Wind Erosion Prediction System (WEPS) model when available.

Use the E table backwards to design the width between trap strips and the potential soil erosion at or below the established soil loss tolerance (T). Adjust the perpendicular strip width based on the angle of deviation for the critical wind period based on weather station data for your location. 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 wind angle of deviation adjustment factors are found in Table 4 of the NRCS MI eFOTG Wind Erosion Prediction Section 1 *or use the Wind Erosion Prediction System (WEPS) model when available.*

If the wind direction is 90 degrees, or perpendicular to the row direction, then the spacing is equal to the widest length (L) at the planned soil loss tolerance (T). Prevailing Wind Erosion Direction and Preponderance during the Critical Period for a particular location are found in Table 4a of the Wind Erosion Prediction section.

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.

Determine the width of strips 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. Establish trap strips immediately upwind from areas that need protection 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

Placement of Trap Strips. Establish trap strips 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. Measure the effective width along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. Design the effective width so the soil loss rate in tons per acre for the crop tolerance is not exceeded. See permitted crop tolerance to wind erosion*, as specified in Table 7, Crop Tolerances to Blowing Soil of the NRCS MI eFOTG Wind Erosion Prediction Section 1 *or the Wind Erosion Prediction System (WEPS) model when available.*

*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.

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

Determine the width of strips using current approved wind erosion prediction technology to estimate wind erosion during specific crop stage 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. Select trap strip vegetation that provides food and/or cover for the targeted wildlife species. Refer to NRCS MI Conservation Practice Standard 327 *Conservation Cover* for recommended species and seeding mixtures.

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

Trap Strip Height. The minimum height of 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, reduce the spacing between trap strips 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, select other conservation practices, including the residue management practices (329A, 329B, or 329C); Conservation Practice Standards 603, Herbaceous Wind Barriers; 589B, Cross Wind Stripcropping; or 380, Windbreak/Shelterbelt Establishment, as alternatives or companions to achieve the conservation objective.

PLANS AND SPECIFICATIONS

Prepare specifications for establishment and maintenance of this practice for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Record specifications using approved job sheets or other acceptable documentation.

OPERATION AND MAINTENANCE

After establishment, fertilize perennial trap strips as needed to maintain plant vigor. Control noxious weeds with mowing or chemicals.

Manage mowing or grazing of trap strips to allow re-growth to the planned height before periods when wind erosion or crop damage is expected to occur.

Remove wind-borne sediment accumulated in trap strips and distribute over the surface of the field as determined appropriate.

Establish or relocate trap strips 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 and they become competitive with the adjoining land use. Mowing or pruning is prohibited during the nesting season of ground nesting birds.

REFERENCE

National Agronomy Manual, 190-V-NAM, Third Edition, June 2002, Part 502, Wind Erosion.

NRCS Core 4 Manual, August 1999, Conservation Buffers, Chapter 3c, Cross Wind Trap Strips.

Table 1: Cross Wind Trap Strip Alternatives

Perennial Grasses	Single Species Seed Rate lbs/ac	Mixture Seed Rate lbs/ac
Big Bluestem	10-20	
Indiangrass	10-15	
Intermediate Wheatgrass	8-12	
Little Bluestem	10-15	
Meadow Foxtail	12-15	4-10
Orchardgrass	10-12	4-6
Perennial Ryegrass	20-25	4-10
Redtop	8-12	2-5
Smooth Bromegrass	12-20	6-12
Switchgrass	5-10	2.5
Tall Wheatgrass	8-12	
Timothy	10-12	
Legumes*		Mixtures Lbs/ac
Alfalfa (vernal)		6-10
Alsike Clover		2-4
Ladino Clover		½ -2
Medium Red Clover		4-8
White Dutch Clover		

* Add to grass mixtures listed above.

Annuals	Lbs/ac	
Winter Rye	120	
Annual Ryegrass	15-20 *	

*drilled. Increase to 25-30 lbs/ac if broadcast seeded