

**NATURAL RESOURCES CONSERVATION SERVICE**  
**CONSERVATION PRACTICE STANDARD**  
**Cross Wind Trap Strips**  
**(Acre)**  
**CODE 589C**

**DEFINITION**

Herbaceous cover established in one or more strips typically perpendicular to the most erosive wind events.

**PURPOSE**

This practice is applied to support one or more of the following:

- Reduce soil erosion from wind and wind-borne sediment deposition.
- Induce snow deposition to improve soil moisture management.
- Improve plant health by protecting the growing crops from damage by wind-borne soil particles.
- Improve air quality by reducing the generation of airborne particulate matter.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to cropland or other land susceptible to wind erosion.

**CRITERIA**

**General Criteria Applicable to All Purposes**

**Orientation and Width of Trap Strips.** Determine the appropriate orientation and width of the trap strips using current NRCS approved wind erosion prediction technology. The minimum width shall be:

- At least 15 feet when vegetation or stubble in the strip will normally be less than one foot during periods when wind erosion is expected to occur. The effective width of strips shall be measured along the prevailing wind direction during those periods when wind erosion is expected to occur.
- At least 25 feet when the effective height of the vegetation or stubble in the strip is normally less than one foot. The effective width of strips shall be measured along the prevailing wind direction during those periods when wind erosion is expected to occur.

**Vegetative Cover.** Trap strips may consist of perennial or annual plants, growing or dead that meet the following criteria:

- Adapted to site conditions.
- Remain erect during critical wind erosion periods.

- Have living vegetation tolerant to sediment deposition.
- Tolerant to accumulated snow drifting in places where significant snow deposition is expected.

For perennial herbaceous vegetation, follow establishment procedures in practice specification 589C, 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, see Table 1 & MSUE Bulletin E-2107 Seeding Practices for Michigan Crops for planting specification guidance.

**Additional Criteria to Reduce Soil Erosion from Wind and Wind-Borne Sediment Deposition and Improve Air Quality by Reducing the Generation of Airborne Particulate Matter**

**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.** Measure the effective width of cropped strips along the prevailing wind direction during those periods when wind erosion is expected to occur.

Estimate trap strips width for your location by consulting the archived MI NRCS Electronic Field Office Technical Guide (FOTG), Section 1, Wind Erosion Prediction E tables to (T).

Use the archived Wind Erosion Equation (WEQ) E table backwards to estimate 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.

Verify and design the final width using the Wind Erosion Prediction System (WEPS Model) Barrier module.

**The wind angle of deviation adjustment factors are found in Table 4 of the NRCS MI FOTG archived 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 Snow Deposition and Soil Moisture Management**

**Location of Trap Strips.** Establish trap strips immediately upwind from areas to where snow will accumulate.

**Direction, Minimum Height and Interval Width.** Place Trap strips as perpendicular to the snow-bearing winds as possible. The minimum trap strip vegetation height shall be three feet. The distance between strips (interval) shall be no more than 20H (20) times the height of the vegetation in the winter months across the area to receive the snow.

### **Additional Criteria to Improve Plant Health by Protecting Growing Crops from Damage by Wind-borne Soil Particles**

Establish Trap strips immediately upwind from areas used for sensitive crops. There shall be no potentially erodible area located between the trap strip and the crop to be protected.

**Direction and Width of Sensitive Crop Strips.** Determine the width of the crop strips using current NRCS approved wind erosion prediction technology (WEPS) to estimate wind erosion during specific crop stage periods.

Determine the effective so it does not exceed the width permitted by the crop tolerance\* to wind erosion (the maximum rate of soil blowing that crop plants can tolerate without significant damage due to abrasion, burial, or desiccation) as specified in the NRCS National Agronomy Manual or other accepted technical references or planned crop protection objective for the period needed for the crop protection.

*\*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.*

## **CONSIDERATIONS**

Wildlife may use trap strips as cover or travel corridors. When planning vegetation, consider vegetation that provides food or cover for wildlife species in the areas. Consider adding forbs and legumes for pollinators, native bees and for other beneficial insects. Utilize a diverse mix of plant species that bloom at different times throughout the year. Refer to your state's official technical references on vegetation establishment and species selection for wildlife food and habitat. The minimum width recommended for wildlife is 30 ft.

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 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); Field Border (386); Herbaceous Wind Barriers; (589B); Stripcropping (585); or Windbreak/Shelterbelt Establishment (380), may be used with, or as alternatives to, trap strips 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 to meet the planned purpose(s).

The following are the minimum specifications to include:

- Purpose(s) of the trap strips.
- Location and orientation of trap strips.
- Width of the trap strip(s).
- Width of the crop interval or distance between trap strips.
- Seedbed preparation, timing, and seeding method.
- Nutrient application, if needed for establishment, to include form, rates, timing and method of application.
- Vegetative mix and seeding rate(s).
- Height of vegetation to be maintained during the critical crop stage periods.
- Time of mowing and/or harvests.

Record specifications using approved job sheets or implementation Requirements Document based on Table 1 Cross Wind Trap Strip Alternatives found in the Michigan Seeding Table As of September 2015.

## **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. When feasible, schedule

harvest, mowing, or other mechanical disturbance of vegetation outside of the primary nesting season for ground-nesting birds.

Remove wind-borne sediment accumulated in trap strips and distribute over the surface of the field as determined appropriate for trap strip function. Reseed if necessary.

Establish or relocate trap strips as needed to maintain plant density, width and height.

Periodically, evaluate the trap strip effectiveness to meet the planned purpose (s) and adapt management as needed.

## **REFERENCE**

USDA, Natural Resources Conservation Service, National Agronomy Manual, 4<sup>th</sup> Edition, Feb. 2011.  
Website: <http://directives.sc.egov.usda.gov/> Under Manuals and Title 190.

Wind Erosion Prediction System (WEPS) website:  
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/tools/weps/>