



**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

CROSS WIND RIDGES

**CODE 588
(AC.)**

DEFINITION

Ridges formed by tillage, planting or other operations and aligned perpendicular to prevailing wind direction during critical wind erosion periods.

PURPOSE

This practice supports one or more of the following purposes:

- Reduce soil erosion from wind – Resource concern (SOIL EROSION - Sheet, rill, & wind erosion).
- Protect growing crops from damage by windblown soil particles – Resource concern (DEGRADED PLANT CONDITION – Undesirable plant productivity and health).
- Reduce soil particulate emissions affecting air quality – Resource concern (AIR QUALITY IMPACTS - Emissions of Particulate Matter (PM) and PM Precursors).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland with soils that are stable enough to sustain effective ridges and cloddiness, such as loamy and clayey soil materials.

This practice is not well adapted on soils with lower aggregate stability such as sandy soil materials and certain organic soils.

CRITERIA

General Criteria Applicable to All Purposes

The ridge orientation, height, spacing, and time period that ridges are present shall be determined using the current approved wind erosion prediction technology and the wind erosion analysis shall account for all existing or planned practices in the conservation management system planning unit.

Orientation of ridges during critical erosion periods shall not exceed 45 degrees from perpendicular to erosive wind direction.

Spacing between ridges shall be no more than 4 times the designed height of the created ridges.

Additional Criteria to Protect Growing Crops from Damage by Windblown Soil Particles.

Wind erosion shall not exceed the crop tolerance of sensitive crops to damage by windblown soil particles as specified in the National Agronomy Manual (Table 502-1). Wind erosion shall not exceed the erosion rates for the client's production goals and planned conservation management system.

CONSIDERATIONS

To be most effective, cross wind ridges should be oriented perpendicular to the direction of erosive winds.

Transport of windblown sediment and sediment-borne contaminants off-site can be reduced by this practice when used in a resource management system.

Adjacent fields, roads or field corners may need treatment to stop saltation of soil particles onto fields protected by cross wind ridges.

To be effective on coarse textured soils such as very fine sandy loams, fine sandy loams, sandy loams, and sand soils; cross wind ridges should be established when the soil is moist. Ridges on these soils will deteriorate quickly and shorten the protection period.

Cross wind ridges may be created at right angles to the predominant erosive wind direction on bare unprotected fields as a form of emergency tillage to reduce wind erosion. Cross wind ridges generally will have a temporary impact on reducing wind erosion and may not last throughout the critical wind erosion period.

Cross wind ridges are most effective when used in combination with other practices in a conservation management system to reduce wind erosion.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the selected conservation practice purposes, criteria, operation and maintenance in this conservation practice standard. Below are the minimum specifications and documentation requirements for each field:

1. Conservation Plan Map identifying practice location.
2. Crop rotation and tillage operation used to create ridges
3. Critical erosion periods of the prevailing wind direction, ridge orientation, and installation date of ridges, ridge height, and ridge spacing
4. Soil loss computations

Record practice design information and requirements using NRCS Wisconsin Job Sheet 588 Cross Wind Ridges.

OPERATION AND MAINTENANCE

Ridges shall be established or re-established by equipment such as chisel plows, drills with hoe openers, or other implements that form effective ridges.

After establishment, ridges shall be maintained through those periods when wind erosion is expected to occur, or until growing crops provide enough cover to protect the soil from wind erosion.

If ridges become ineffective they shall be re-established unless doing so would damage a growing crop.

FEDERAL, TRIBAL, STATE, AND LOCAL LAWS

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements. This standard does not contain the text of federal, tribal, state, or local laws.

REFERENCES

Skidmore, E.L. and N.P. Woodruff. 1968. Wind erosion forces in the United States and their use in predicting soil loss. USDA, Agriculture Handbook 346.

USDA, ARS. 2006. The Wind Erosion Prediction System, (WEPS ver. 1.3.9), User Manual, 2011 Wind Erosion Research Unit, Manhattan, Kans.

USDA, NRCS. 2011. National Agronomy Manual. 190-V. 4th ed., Part 502, Wind erosion. Website: <http://directives.sc.egov.usda.gov/> Under Manuals and Title 190.

USDA, NRCS. 1993. Soil survey manual. USDA Handbook 18.

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