

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CROSS WIND RIDGES (ACRE)

CODE 589A

DEFINITION

Ridges formed by tillage, planting, or other operations and aligned across the prevailing wind erosion direction.

PURPOSE

Reduce soil erosion from wind.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland.

It is best adapted on soils that are stable enough to sustain effective ridges and cloddiness such as clayey, silty, and sandy loam soils.

It is not well adapted on unstable soils such as sands, loamy sands, and certain organic soils.

CRITERIA

General Criteria Applicable To All Purposes

Ridge Height, Spacing, and Direction:

Acceptable combinations of ridge height, spacing and direction are those having ridge roughness K_{rd} values equal to 0.8 or less during those periods when wind erosion is expected to occur. Ridge roughness is discussed in the National Agronomy Manual, Subpart 502.32, and K values are displayed in EXHIBITS 502-4 or 502-5. **The effect of ridges varies as the wind direction and erodibility of the soil changes during the growing season. To take into account the change in wind directions across a field, the angle of deviation must be considered. The angle of deviation is the angle between the prevailing wind erosion direction and a line perpendicular to the row direction. In Montana**

using the WEQ Management Period Method, K_{rd} ridge roughness can be determined by identifying the following information:

1. Ridge Height (inches) made by tillage or planting implements.
2. Ridge Spacing (inches).
3. Soil Erodibility Factor (I) of the planning soil map unit.
4. Angle of Deviation (0°, 22.5°, 45°, 67.5°, 90°).

Then, using the formula:

$$K_r = \frac{4(h \times h)}{S}$$

where h = Ridge Height (INCHES)
s = Ridge Spacing (INCHES)

determine Soil Ridge Roughness (K_r).

Then, using the I factor, angle of deviation, and the charts in the Cross Wind Ridges Specification, determine the Soil Ridge Roughness Factor (K_{rd}).

CONSIDERATIONS

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

The ability of a particular soil to sustain ridging is dramatically affected by soil moisture and texture.

Ridges are most effective when established 90° to the prevailing wind direction and at height and width dimension ratio of 1:4.

(EXAMPLE: 2 inches high ridges, 8 inches wide spacing)

NRCS, MT
September 2002

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard contact the Natural Resources Conservation Service.

NOTE: This type of font (AaBbCcDdEe 123..) indicates NRCS National Standards.
This type of font (AaBbCcDdEe 123..) indicates Montana Supplement.

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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 and Maintenance** described in this standard.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

As a minimum, documentation for the Cross Wind Ridges component of the conservation plan shall include:

- **Plan map of managed field(s).**
- **Soils map of the managed field(s).**
- **Identification of the planning soil map unit.**
- **Identification of planned ridge height.**
- **Identification of planned ridge spacing.**
- **Before and after soil loss prediction using WEQ Management Period Method.**
- **Timing of application.**
- **Operation and maintenance.**
- **Cross Wind Ridges job sheet.**

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 deteriorate and become ineffective due to weathering, erosion, or change in expected prevailing wind erosion direction, they shall be re-established unless doing so would damage a growing crop, **or result in less than adequate residue amounts to protect the soil.**

REFERENCES

USDA, National Agronomy Manual, 3rd Edition, Subpart 502. June 2002.