

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

SURFACE ROUGHENING

(acre)
CODE 609

DEFINITION

Roughening the soil surface by ridge or clod-forming tillage.

PURPOSES

To reduce wind erosion on cultivated land, especially during periods of high probability for erosive winds.

CONDITIONS WHERE PRACTICE APPLIES

On soils that have a surface layer suitable for clod formation or ridging and have high potential for wind erosion due to lack of vegetative cover.

CRITERIA

Acceptable combinations of ridge height, spacing, and direction are those having Ridge Roughness K values equal to 0.8 or less during those periods when wind erosion is expected to occur. K values are displayed in the National Agronomy Manual, Exhibit 502.62(a).

Fields shall be listed or bedded up during erosive, non-crop periods as nearly as practical perpendicular to the direction of erosive winds.

Chisel or list across the prevailing erosive wind direction without introducing long furrow lengths on gradients that will cause water erosion. Leaving alternate tilled and untilled strips of equal width can be effective.

CONSIDERATIONS

Surface roughening is most effective when the tillage operation will bring clods to the soil surface durable enough to resist wind erosion. Field investigations or local knowledge should indicate that sufficient roughness and cloddiness will result on the soils in each field.

When irrigation water is available, consideration should be given to establishing strips of fast growing

cover during erosive, non-crop periods as an alternative.

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

Where water erosion along the furrows formed by ridges is a concern, the hazard can be reduced by farming across the slope according to the standards for 330 - CONTOUR FARMING.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Some species are year-round residents in some streams, such as, freshwater shrimp. Other species, such as steelhead and salmon, utilize streams during various seasons. Be aware that during critical periods, such as spawning, eggs in gravels and rearing of young may preclude activities in the stream that may directly affect

the stream habitat during those periods. For example, there should be no disturbance of stream gravel beds that may have eggs in them. That could include any equipment in the stream or even walking in the stream or work upstream that may result in sediment depositing in the gravel beds. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Water Quantity

This practice may have little effect on water quantity at the time when it is installed. However, when precipitation occurs, early season infiltration may be increased making more water available to the root zone and runoff decreased.

1. Effects on the water budget, especially on volumes and rates of runoff and infiltration.

Water Quality

The practice will temporarily improve water quality because soil erosion by wind will be reduced and the potential for soil deposition in ditches or surface waters as sediment would decrease. Agricultural chemicals, that would be attached to the wind blown soil, would be less available for transport to downstream surface waters.

1. Effects on erosion and the movement of soil and soil-attached substances by wind.
2. Effects on erosion and the movement of sediment, and soluble and sediment-attached substances carried by runoff.

PLANS AND SPECIFICATIONS

Specify methods, time of tillage, and suitability of soils for each field or treatment unit.

Indicate the direction and spacing of ridges and the type of chisel or lister equipment that will be used.

Indicate that equipment depth and speed will be adjusted to produce the maximum surface roughness and cloddiness.

When alternating strips are left untilled, indicate that they will be treated at a later date if prolonged effectiveness is needed.

Specifications shall be recorded using approved specification sheets, job sheets, or other acceptable documentation.

OPERATION AND MAINTENANCE

Ridges shall be reestablished by normal tillage and planting equipment such as chisel plows, drills with hoe openers, or other similar implements, which 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 or erosion, they shall be reestablished unless doing so would damage a growing crop.