

Surface Roughening - **SR**



DEFINITION

The use of mechanized equipment to apply a rough texture to soils at final grade.

PURPOSE

Surface roughening or scarification is a technique used for creating unevenness on bare soil to prevent slope erosion and the formation of rills. The primary functions of surface roughening are to:

- Reduce erosion potential by decreasing runoff velocities
- Trap sediment
- Increase infiltration of water into the soil
- Aid in the establishment of vegetative cover

DESIGN CRITERIA

Roughening methods with agricultural equipment include tilling, disking or harrowing, which must be done across the slope along the contour. Tracking (Figure 1)

with tracked equipment, by contrast, must be done up and down the slope. Factors to be considered in choosing a method include slope steepness, long term slope maintenance and mowing requirements, type of soil, and whether the slope is formed by cutting or filling. Generally, a slope cannot be mowed if it is steeper than 3:1 (H:V). Roughening is performed after the slopes have been graded and dressed. Steep slopes may require the techniques discussed in specification **Gradient Treatment - **GT****.

Cut Slope Roughening: Cut slopes are created by the removal of soil and/or rock material leaving a newly exposed slope face. Tilling, disking, and harrowing are acceptable methods of roughening a cut slope. Groove the slope using machinery to create a series of ridges and depressions that run across the slope and on the contour. Make grooves less than 10 inches apart and not less than 1 inch deep. Excessive roughness is undesirable where mowing is planned.

Roughening with tracked machinery should preferably be limited to soils with a sandy textural component to avoid undue

compaction of the soil surface. Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Each pass should move across the slope gradually. Apply fertilizer, mulch, topsoil, or other soil amendments as necessary prior to grooving or tracking. Do not blade or scrape the final slope face.

Fill Slope Roughening: Fill slopes are created by the placement of fill material in a position that creates a slope. Fill slopes are not as stable as cut slopes, no matter how much compaction is applied. The face of the slope should consist of loose uncompacted fill 4 to 6 inches deep.

Use grooving or tracking to roughen the face of the slopes as necessary. Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Each pass

should move across the slope gradually. Apply fertilizer, mulch, topsoil, or other soil amendments as necessary prior to grooving or tracking. Do not blade or scrape the final slope face.

Stabilization: Once the treatment has been applied take the appropriate measures to stabilize all the bare area. Refer to specifications **Disturbed Area Stabilization (With Permanent Vegetation)** - **PS**, and **Matting and Blankets** - **MA**.

MAINTENANCE

Maintenance needs identified in inspections or by other means should be accomplished before the next storm event if possible, but in no case more than seven days after the need is identified.

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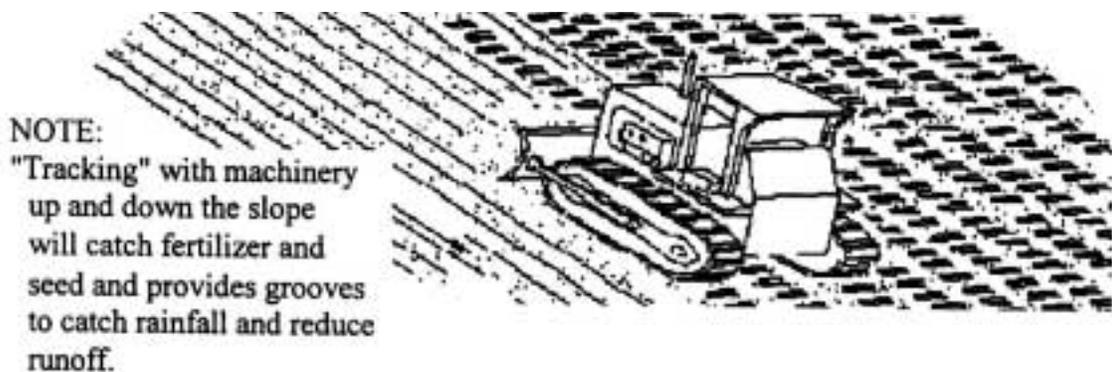


Figure 1

Source: Knoxville Engineering Department