Surface Roughening (SR)

Practice Description

Roughening a sloping bare soil surface with horizontal depressions helps control erosion by aiding the establishment of vegetative cover with seed, reducing runoff velocity, and increasing infiltration. The depressions also trap sediment on the face of the slope. This practice is especially appropriate for soils that are frequently disturbed and on piles of excavated soils.

Roughening methods include stair-step grading, grooving and tracking. Equipment such as bulldozers with rippers or tractors with disks may be used. The final face of the slopes should not be bladed or scraped to give a smooth hard finish.

Planning Considerations

Surface roughening should be considered for all slopes. The amount of roughening required depends on the steepness of the slope and the type of soil. Stable sloping rocky faces may not require roughening or stabilization, while erodible slopes steeper than 3:1 require special surface roughening.

Design Criteria and Installation

Surface roughening is to be done only after cuts and fill are to final grade and shape.

Cut Slope Roughening (Areas not to be mowed)

Use stair-step grades or groove cut slopes with a gradient steeper than 3:1. Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Do not make

individual vertical cuts more than 2 feet in soft materials or more than 3 feet in rocky materials.

Grooving

Grooving uses machinery to create a series of ridges and depressions that run across the slope (on the contour). Groove using any appropriate implement that can be safely operated on the slope, such as disks, tillers, spring harrows, or the teeth on a front-end loader bucket. Do not make such grooves less than 3 inches deep nor more than 15 inches apart.

Fill Slope Roughening (Areas not to be mowed)

Place fill slopes with a gradient steeper than 3:1 in lifts not to exceed 9 inches, and make sure each lift is properly compacted. Insure that the face of the slope consists of loose, uncompacted fill 4 to 6 inches deep. Use grooving, as described above, to roughen the face of the slopes, if necessary. Do not blade or scrape the final slopes face.

Cuts, Fills, and Graded Areas That Will Be Mowed

Make mowed slopes no steeper than 3:1. Roughen these areas to shallow grooves by normal tilling, dishing, harrowing, or use of cultipacker-seeder. Make the final pass of any such tillage implement on the contour. Make grooves formed by such implements close together (less than 10 inches) and not less than 1 inch deep. Excessive roughness is undesirable where moving is planned.

Roughening with Tracked Machinery

Limit roughening with tracked machinery to sandy soils to avoid undue compacting of the soil surface. Tracking is generally not as effective as other roughening methods described. Operate tracked machinery up and down the slopes to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.

Seeding

Immediately seed and mulch roughened areas to obtain optimum seed germination and growth.

Common Problems

Tracking in the wrong direction, perpendicular to the slope, can accelerate rill erosion.

Figure 3 Rill Erosion

Maintenance

Inspect roughened areas after storms to see if re-roughening is needed. Regular inspection should indicate where additional erosion and

sediment-control measures are needed. If rills appear, fill, regrade, and reseed them immediately. Use proper *Dust Control* methods.

References

BMPs from Volume 1