

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

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## FIELD MEASUREMENT OF RILL EROSION

The following information was transmitted by WEST TSC Bulletin No. W190-1-20 dated April 2, 1981, and provides SCS employees with an easy method of providing land users with an estimate of soil loss from rill erosion after a single storm or a series of storms or at the end of the rainy season.

This information is based on WEST TSC CONSERVATION AGRONOMY NOTE NO. 25-Revised dated March 1981. Please destroy all copies of the original Tech Note 25 dated December 1965. The revision changes the length of the sample strip from 42 or 84 feet to 37.5 or 75 feet. This correction was suggested by Dr. D. K. McCool, USDA-SEA-AR, at Pullman, Washington.

The method explained below for measuring rill erosion in tons per acre is known as the Alutin Rill Erosion Method. It was originally worked out by A. N. Alutin when he worked for SCS at Tacoma, Washington. This procedure accounts for 80% of lysimeter measures that involve losses of 5 to 100 tons per acre. Losses greater than 100 tons per acre are usually beyond the realm of rilling.

The basic formula used in this calculation is:

T/Ac. soil loss = sum of cross section of rills in square inches along a measured lineal distance of 12.5 feet across the slope.

The procedure for field measuring rill erosion that is generally accepted is as follows:

- Step 1 - Pace off or measure a lineal distance of 37.5 or 75 feet across the slope. Choose a representative strip at right angles to the general direction of the rills.
- Step 2 - Measure in inches the average width (top plus bottom divided by 2) and depth of each rill along the chosen distance.
- Step 3 - Multiply each average width and depth reading to obtain a product in square inches.
- Step 4 - Add all products of readings along chosen distance.
- Step 5 - Divide this sum by 3 if a 37.5 foot distance was selected, and by 6 if 75 feet was chosen. The result is tons of soil loss per acre.

See example on next page.

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Example

Ave. Width (in.) X Depth (in.) = Area in sq. in.

3	3	9
2	3	6
3	6	18
4	6	24
3	5	15
5	6	<u>30</u>
		102

For a chosen distance of 37.5 feet the soil loss =  $102/3 = 34$  tons/ac.

Judgement in selecting representative sites for measurement is essential in making good estimates. On large fields, several strips may need to be sampled and their results averaged.

This method was also published as page G-1 in the old 4.5 x 7.5 inch loose leaf conservation field handbook available in the early 1960s. Corrections are needed to change 13.7 feet to 12.5 feet and multiples of 12.5 feet. For uniformity, the method presented in this Technical Note should be used.