

## Assessment of surface runoff and soil losses over snow covered soils under artificial rainfall

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### Summary

It is well known that sudden snow melting in early spring and especially spring-rainfalls on snow-covered soils cause excessive soil and water losses. The objective of this study was to determine surface runoff and soil losses from snow covered soils under different rainfall intensity. Texturally different three soil samples (loam (L), sandy loam (SL) and clay (C)) were collected from the Experimental Research Station of Ataturk University in Erzurum in where freezing-thawing processes are commonly seen. Soil samples passed through 4.76 mm sieve were put into 30x30x10 cm trays and 5 cm snow layers were added on these samples and frozen at  $-4^{\circ}\text{C}$ . Following thawing, consecutive artificial rainfalls with different intensities (1.0; 2.5 and 5.0  $\text{cm h}^{-1}$ ) were applied with 15 and 30 minutes on samples located at 9% slope gradient using rainfall simulator under laboratory conditions. Surface runoff and sediment yield were collected within a conserved area and the results were compared. The results indicated that the amounts of runoff and soil losses were greatly affected by soil properties, rainfall intensity and time. The maximum amounts of soil losses were obtained from the highest rainfall intensity (5.0  $\text{cm h}^{-1}$ ) with 30 minutes rainfall and soil with sandy-loam texture. The highest surface runoff at the same rainfall intensity was obtained from C-textured soil samples. The erosion rates estimated for the highest rainfall intensity with 30 minutes period were 66  $\text{tons ha}^{-1}$  for SL-textured soil, 55  $\text{tons ha}^{-1}$  for L-textured soil and 48  $\text{tons ha}^{-1}$  for C-textured soil. On the other hand, the amounts of surface runoff were the highest for C-textured soil and the lowest for SL-textured soil. The results of this study clearly indicated that the amounts of surface runoff and soil losses were affected by soil properties, rainfall characteristics and rainfall period.

**Key words:** surface runoff, soil loss, erosion, rainfall simulator