

Effects of grazing on soil compaction and some soil properties in rangelands case study: Kahramanmaraş Ahır Mountain

Mahmut Reis¹, Hurem Dotal^{1,*}, Bülent Abız¹, Mimar Sinan Özkaya², Kübra Nur Kalaylı¹

¹ Department of Forest Engineering, Kahramanmaraş Sütçü İmam University, Kahramanmaraş, Turkey

² Kahramanmaraş Regional Directorate of Forestry, Kahramanmaraş

* Corresponding author: huremdotal@ksu.edu.tr

Abstract: Soil compaction which has highly impact on soil erosion, runoff and productivity is one of the common problems in rangelands under uncontrolled and intensive grazing pressure. In this study, effects of soil compaction on some soil properties in rangelands of Ahır Mountain under intensive grazing pressure are revealed. With this aim, 3 different factor including enclosure, grazed and pathway (transition routes of livestock) areas are selected. 3 plots, each one is 1000 m², are established in each factor area. Homogeneously distributed 360 penetrometer measurements are performed to determine soil compaction in these plots. Soil compaction is measured in depths of 5, 10, 15 and 20 cm. In order to calculate soil properties such as bulk density, permeability and water holding capacity, 10 undisturbed soil samples are taken from each plot. Soil compaction values in depth of 5 cm are determined as 845.6 kPa, 1739.3 kPa and 1928.1 kPa in enclosure, grazed and pathways areas respectively. In study area, it is determined that soil compaction increases as soil depth increases. It is found that soil compaction in pathways known as route used by livestock to arrive grass and grazed areas is higher compared to enclosure areas. According to soil properties of pathways and grazed areas, it is observed that bulk density is higher, whereas pore volume, permeability and water holding capacity are lower due to livestock pressure.

Keywords: Soil compaction, Permeability, Water holding capacity, Grazing