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Soil heat flux density measurements to evaluate soil conservation practices in semiarid conditions

Rosario García Moreno (1), Ruben Moratiel Yugueros (2), Maria Cruz Diaz Alvarez (2,3), and Francisca Guerrero (3)

(1) Universidade Da Coruña, Faculty of Sciences, Departamento de Ciencias Da Navegación e Da Terra. Facultad de Ciencias, A Coruña, Spain (rosario.garciam@udc.es), (2) CEIGRAM (Centro de Estudios e Investigación para la Gestión de Riesgos Agrarios y Medioambientales). Departamento de Producción Vegetal: Fitotecnia, Universidad Politécnica de Madrid, Madrid, Spain. , (3) Dpto. Edafologia. E.T.S.I. Agronomos. Universidad Politecnica de Madrid, Madrid. Spain

Soil energy is an important parameter in order to understand the flux of energy between the plant and the soil. This parameter determines the potential for future production of soil. In the case of bare and protected soils the balance is quite different because of the pattern of surface energy flux. This behaviour is conditioned by the erosion condition of the soil. In order to evaluate the relation between erosion conditions and soil energy, the authors monitored from fall to spring two different types of bared soils. One of the experimental sites was characterized for being a cereal cropping soil left resting during fall and winter. The other experimental site was chosen in the area of transit of the tractors near the first site. Soil heat flux density was measured with a heat flux plate sensor buried at a depth of 0.05 m in both experimental sites. The change in heat storage in the soil layer above the heat flux plates was measured by inserting metallic sensors at an angle from near the bottom to near the top of the soil layer (roughly about 4 to 1 cm below the soil surface).The parameter chosen to evaluate the relation of the soil energy to potential erosion process was soil surface roughness. This indicator was measured once per week. Also some evaluations of the biological activity of the soils served to complement the parameters. The results indicated that the losses in the energy in the soil surface are greater when the roughness decreases and the compaction is increased.