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Influence of the substitution of a grass cover by a mulch on infiltration rate

A. Sastre-Merlín (1), S. Martínez-Pérez (1), R. Bienes-Allas (2), E. Molina-Navarro (1), and L. Martínez de Baroja (1)

(1) Department of Geology, School of Sciences, University of Alcalá. Madrid, Spain., (2) IMIDRA, Comunidad de Madrid, Spain.

The study was carried out in an urban park of Madrid, in which it was decided to remove part of the prairie, replacing it by a mulch (pine bark). One year after this change in soil cover, infiltration tests were performed using the double ring infiltrometer (Müntz method). In each treatment the number of repetitions was 3.

In the infiltration tests carried out the mulch not was withdraw, since we want to study their behavior before a rain or overhead irrigation.

After one year, the infiltration rate showed ??much higher values in the prairie (18.9 mm h^{-1}) than in the pine bark (8.4 mm h^{-1}). Removing the prairie has meant a reduction in permeability of about 55%, which demonstrates the important role exerted by the radicular systems on infiltration. The origin is in the ability of roots to create preferred pathways circulation of the water. These pathways are of various types, and perhaps the most important are the root tubes, which are the channels that occur in the soil once the roots decompose. The finer roots create these pathways faster. These root tubes end up crumbling over time, so that is necessary to maintain the constant creation of new pipes in the soil. Under a prairie the number of root tubes that forms annually is enormous.

By contrast, in absence of roots, in the surface horizon begins a process of gradual compaction, with reducing of the macroporosity and consequently impacting on the infiltration rate.

The first consequence of this reduction in the infiltration rate is a poor flushing of salts from the soil of reclaimed water used in irrigation. This assertion has been corroborated by the analysis of the soil saturated paste, which shows an increasing of the electrical conductivities under the mulch.

E.C. (μS cm^{-1}) at the beginning of 2011 irrigation season (March) at different depths. Efficiency of the rains of autumn-winter by to wash soil salts.

Depth (cm)	Prairie	Pine bark
20	340	320
35	310	480
60	340	550

Therefore, the results indicate that vegetation cover favors the increase of the volume of pores and their interconnections, and thus their ability to transmit water in the infiltration process and its ability to wash the salts.