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Plant canopy and soil cover effects on surface runoff and soil loss in orchads from Mediterranean soils

M. Ben-Hur (1) and **M. Lado** (2)

(1) Institute of Soil, Water and Environmental Sciences, the Volcani Centre, ARO, Israel (meni@volcani.agri.gov.il), (2) Area of Soil Science, Faculty of Sciences, University of A Coruna, Spain (mlado@udc.es),

One of the main soil degradation problems in orchads, specially in Mediterranean areas, is soil erosion. The presence of deciduous trees that remain without leaves during the rainy season, and/or a management that includes tilling the soil before the winter, leaves a variable amount of soil surface exposed to the direct impact of the raindrops. As a consequence, surface sealing, runoff generation and soil loss are enhanced. In this work, the effect of canopy cover and mulching the soil surface with wood residues to control surface runoff and soil loss in orchads was evaluated.

In a sandy soil, inter-row crops of wheat reduced runoff and soil loss as compared with bare soil only when the canopy of the crop was well developed before a seal was formed in the surface. When a surface seal was formed prior to the development of the crop, no positive effect was observed. Mulching the soil surface with wood residues was very effective reducing runoff generation and soil loss in arid and semiarid soils with texture ranging from sandy to clayey, mainly because it prevented the formation of a seal due to the impact of the raindrops on the soil surface. In addition to the protective effect against the raindrop impact, mulch decomposition increased the organic matter content in a sandy and a sandy clay loam soils. As a result, the aggregate stability increased and the clay dispersivity decreased in these soils, preventing structural degradation during wetting and preserving soil hydraulic properties.