

The Effect of Wool Mulch on Plant Development in the Light of Soil Physical and Soil Biological Conditions

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Abstract : Mulching techniques can be a solution for better utilization of precipitation and irrigation water and for mitigating soil degradation and drought damages. Waste fibres as alternative biodegradable mulch materials are increasingly coming to the fore. The effect of wool mulch (WM) on water use efficiency of pepper seedlings were investigated in different soil types (sand, clay loam, peat) in a pot experiment. Two semi-field experiments were also set up to investigate the effect of WM-plant interaction on sweet pepper yield in comparison with agro-textile and straw mulches. Soil parameters (moisture, temperature, DHA, β -glucosidase enzymes, permanganate-oxidizable carbon) were measured during the growing season. The effect of WM on yield and biomass was more significant with less frequent irrigation and the greater the water capacity of soils. The microbiological activity was significantly higher in the presence of plants, because of the water retention of WM, the metabolic products of roots and the more balanced soil temperature caused by plants. On the sandy soil, the straw mulch had a significantly better effect on microbiological parameters and yields than the agro-textile and WM. WM is a sustainable practice for improving soil biological parameters and water use efficiency on soils with a higher water capacity.

Keywords : β -glucosidase, DHA enzyme activity; labile carbon, straw mulch; plastic mulch, evapotranspiration coefficient, soil temperature

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