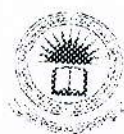


# REVIEW ON THE IMPACT OF TILLAGE SYSTEM ON SOIL MOISTURE



By

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## ABSTRACT

Water penetration in soil and the increase of water storage on soil profile are influenced by hydro-physical properties, soil texture and compaction which are closely interdependent and influenced by the tillage system. Tillage exerts adverse effects on soil when it is performed under inadequate moisture conditions or when inadequate tillage implements are used. Therefore, a literature review study was carried out with the objectives of studying and summarizing the findings on the effect of soil tillage on soil moisture content and to find out research gaps in soil tillage.

Of the several soil tillage systems reviewed, it has been found that zero tillage/no tillage facilitates better infiltration, protect soil moisture and less evaporation under some soil conditions. The adoption of zero-tillage allows more intensive cropping sequences, because zero-tillage results in increased rainwater infiltration and retains more water in the potential root compared to conventional-till. However, the soil under conventional tillage had significantly higher moisture content than tested reduced till, mulch till and zero-till treatments. Sub soiling improves root penetration and infiltration rate, which can be helpful for soils with drainage problems as well as those with moisture deficits. Minimum tillage application reduces the soil mobilization and due to this, soil is compacted in the first years of application. Soil moisture is higher in no tillage and minimum tillage at the time of sowing and at the early stages of vegetation, then the differences diminished over time. Mulch tillage ensures a maximum retention of crop residues (30% or more) on the soil surface. Less evaporation with increased soil cover allows greater water absorption and transpiration under the mulch tillage.

Future researches and new experiments need to be evaluate the effect of soil types, crops and farming systems on soil moisture under no tillage system. However, studies on conventional tillage with respect to soil moisture are needed at different environmental conditions. Further, studies on water use efficiency and yield at different soil types under conventional tillage are strongly recommended for better management of soil moisture. The findings obtained so far on minimum tillage reveal that studies related to different degree of soil disturbances have not been investigated extensively. Studies pertaining to mulch tillage together with mechanical tillage need to be evaluated to study about the moisture availability in soils.

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