**Effect of Different Mulches on Water Conservation in Carrot (*Daucus Carota* L.*)* Grown in Disturbed and Undisturbed Soils**

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Carrot (*Daucus carota* L.) is a biennial plant, grown annually and belongs to the Apiaceae family. An experiment was conducted at the research field of the Agricultural Research Station in Seetha Eliya, Nuwara-Eliya, Sri Lanka, from September - December 2022 to evaluate the effect of different mulching materials on soil water conservation and thermal regulation in disturbed and undisturbed carrot grown soils. Different mulching materials such as gliricidia (*Gliricidia sepium* L.) leaves, citronella grass (*Cymbopogon nardus* L.) leaves, paddy husks, sawdust, black polythene, and transparent polythene were introduced to the disturbed and undisturbed soil to evaluate water retention ability in rooting zone of carrot. The experiment was set up under a split-plot design with three replicates. The effect of ploughing and mulching was dominant on soil water retention and that significantly influenced (P<0.05) all the studied parameters in carrots. Significantly higher cumulative water retention in the disturbed soils was founded in the carrot plots, mulched with citronella grass leaves (116.7%). According to the analysis, no significant difference between citronella grass leaves and paddy husk mulch was discovered (P>0.05). Moreover, significantly higher soil water retention in the treatment of mulching paddy husk in the soil promoted thermal dynamics (maximum 18.90C and minimum 17.4 0C) in the active root zone of carrots. According to the yield parameters, the maximum mean root length and diameter were found in disturbed soils than in undisturbed soils. Similarly, a significantly higher plot yield was recorded with paddy husk mulch in disturbed (33.5t/ha) and undisturbed soil (29.5t/ha). A significantly similar forking root percentage was also found in all the mulching treatments in undisturbed soil. Results generated from the study are beneficial to formulate soil water conservation packages to recommend farmers for sustainable carrot cultivation.

**Keywords:** *disturbed and undisturbed soils, mulching material, soil water retention, thermal dynamics*