NATURAL AND ARTIFICIAL MATERIALS AS SOIL BARRIERS TO INCREASE THE WATER RETENTION ABILITY OF SANDY REGOSOLS

BY

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ABSTRACT

A laboratory and a field experiment were conducted on sandy regosols of the eastern region of Sri Lanka during the dry season of 1993. The main objective of the study was to identify the possibility of using some natural (red soil + coir dust) and artificial materials (cushion) as soil barriers to increase water use efficiency of Ground nut (MI-1). The laboratory experiment was conduted as a preliminary study to identify the water retention release characteristics of the materials tested and the field experiment was carried out to study the applicability of these materials in the field with crops. In addition to the soil barriers the field experiment included two irrigation intervals as the sub treatment and the treatment were arranged in a split-plot design.

The results from the laboratory experiment indicate that the tested soil barriers have a significant effect on moisture retaining ability. Cushion, the artificial material was found to be the best material to retain more moisture in the soil compare to others. The performance of the material in the field were listed based on three parameters namely dry matter production of plant, yield and water use efficiency (WUE).

The results from field experiment revealed that both, the materials and the irrigation treatments have a

significant effect on total dry matter production, yield and WUE. Cushion was the best performing material among the tested materials. the response to yield was similar in both treatments with red soil and coir dust. The yield was high in the treatment with cushion under daily irrigation. However, the highest water use efficiency of grount nut was reported under the treatment combination of cushion with irrigation an alternate days.Compared to yhe average yield of grount nut (2500-3000Kg) under sandy soil condition the yield from all the treatments with different materials were high ranging from 2707 to 5679 Kg/hac under daily irrigation and 2107 to 4842 Kg/hac alternate days irrigation respectively. Hence, it is suggestive that if yield only is considerd cushion with daily irrigation would be the most suitable combination for sandy treated soil. But when considering the water use efficiency, cushion with alternate days of irrigation would be an appropriate combination perticulaly where water shortage is a problem.

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