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Effect of moisture conservation techniques on growth and yield of summer groundnut

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ABSTRACT
Effect of different mulches on soil moisture conservation and crop yield of groundnut (*Arachis hypogea* L.) is presented. Sugarcane trash mulch, wheat straw mulch, black plastic mulch, transparent plastic mulch were used in the study. Result showed that per cent increased in soil moisture conservation over control was maximum in sugarcane trash mulch (13.56%) followed by black plastic mulch (12.34%), transparent plastic mulch (10.74%) and wheat straw mulch (7.04%). The maximum crop yields was observed in transparent plastic mulch (24.87 q/ha.) followed by black plastic mulch (22.73 q/ha.), sugarcane trash mulch (21.42 q/ha.) wheat straw mulch (21.42 q/ha.) and control (10.78 q/ha.). As a result of better moisture conservation and higher crop yield the transparent plastic mulch gave the higher water use efficiency (WUE) of 37.03 kg/ha-cm, which was 83.68 % more than that of control.

Key words : Soil moisture conservation, Mulches, Yield.

INTRODUCTION

Water is most limiting natural resource in arid and semi-arid region. Due to inadequate and uneven distribution of rainfall during the growth span of crop, it become essential to supply water to the plants through irrigation. As water is becoming costly input in agriculture production, optimization of this input on scientific basis with modern concept is essential. In areas where limited water supplies are available, suitable method of irrigation coupled with moisture conservation plays an important role in increasing the water use efficiency and crop productivity. The major water losses take places in the nature are due to evaporation, transpiration and percolation of water. Among these percolation losses can be avoided to some extent by applying required depth of water to the plants. Transpiration losses are hard to control where as evaporation losses can be easily minimized by using mulching approach.

Groundnut is one of the most important oil seed legume crop of India. India ranks first in the world in respect of groundnut area and production, but eight in productivity. To exploit the production potential of summer groundnut, it is a urgent need to provide irrigation water coupled with mulch. Use of plastic mulch had a positive effect on growth and yield of groundnut (Delhare and Lechat, 1986).

MATERIALS AND METHODS

The experiment was conducted in a randomized block design in the field of water management research project, M.A.U., Parbhani., in plots of 3m x 7m. The treatments were sugarcane trash mulch (T_1), wheat straw mulch (T_2), black plastic mulch (T_3), transparent plastic mulch (T_4) and control (T_0). The summer groundnut crop (variety, TG-26.) was sown on 4th Feb. 2002. with spacing of 30cm between the rows and 10cm between the plants. The crop was fertilized and mulched as per treatments. During crop growing period, the field capacity of soil and the average soil moisture before irrigation was taken onto account for calculating the depth of irrigation water supposed to be applied in each treatment. The moisture contents in all the plots were measured with the help of ' Neutron-probe', before application of each irrigation. The moisture content was measured at 15, 30 and 45cm depths of soil profile.

RESULTS AND DISCUSSION

The average soil moisture conservation before irrigation observed in each treatment and the total depth of water applied to each treatment in the crop growing period are given on Table 1 and fig. 1 (a) and (b). The data reveals that sugarcane trash mulch conserved maximum moisture (23.36 %) followed by black plastic mulch (23.11 %), transparent plastic mulch (22.78 %),

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