

## Effect of mulching and land configuration on moisture use, moisture use efficiency and yield of soybean (*Glycine max* L.)

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### ABSTRACT

An experiment was conducted to know the effect of mulching and land configuration on moisture use, moisture use efficiency and yield of soybean (*Glycine max* L) at Department of Agronomy, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during *Kharif* season 2006. It revealed that application of straw mulch recorded lowest moisture use (292.75 mm) as compared to no mulch (299.93 mm) and moisture use efficiency was found highest in mulch plot (6.35 kg/ha-mm) over no mulch plot (5.06 kg/ha-mm). The maximum grain yield (1855.06 kg/ha) was recorded under mulch plot which was 18.12% more over no mulch plot. Among land configuration treatments, lowest moisture use was recorded in ridges and furrows (290.89 mm) followed by opening of furrows after every two rows (294.22 mm) and highest in flat bed (303.91 mm). Moisture use efficiency was found highest in treatment plot of ridges and furrow (6.23 kg/ha-mm) followed by opening of furrows after every two rows (5.99 kg/ha-mm) and lowest in flat bed (4.90 kg/ha-mm). Treatment plot of ridges and furrow recorded significantly higher yield of soybean as compared to other treatments.

**Key words :** Mulching, Land configuration, Moisture use, Moisture use efficiency

### INTRODUCTION

Soybean (*Glycine max* L.) is one of the important oilseeds as well as leguminous crop. Due to its high nutritive value soybean cultivation has taken great strides during the recent years. It is cheapest and richest source of high quality protein. Among all legumes, soybean is most sensitive to soil moisture. After few showers, in month of July-August the monsoon rains are usually heavy and frequent. High evaporation under rainfed conditions especially after rainy season results high consumptive use and water loss from the soil which reduces water availability and moisture use efficiency of crop. Due to reduced soil moisture availability crops suffers from water stress and yield of crop gets reduced drastically. The loss in yield can be minimized if good amount of water is stored in soil. By adopting soil moisture conservation technique water availability and water utilization by crop increased to greater extent. So adoption of the agronomic practices like mulching is helping in reducing water loss from soil. Singh *et al.* (2006); Tomer *et al.* (2005) reported that use of mulching reduces water loss from soil, and increases yield, individually. So, the present study was conducted to evaluate the effect of mulching and land configuration on moisture use, moisture use efficiency and yield of soybean.

### MATERIALS AND METHODS

An experiment was conducted during *Kharif* season

of 2006 at Agronomy farm of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The soil of the experimental plot was clayey in texture with 0.42 % organic carbon, and 197.40 kg/ha, 17.64 kg/ha, 356.85 kg/ha available N, P and K, respectively. Soil was slightly alkaline in reaction (pH=7.78). The field capacity and permanent wilting point in 0-30 cm depth were 33.50 and 15.60 per cent, respectively. The bulk density was 1.30 Mg m<sup>-3</sup> for 0-30 cm soil depth. The rainfall received during crop season was 726.5 mm. The mean evaporation rate noted during crop season was 5.38 mm/day. Soybean crop variety TAMS-38 was sown on 21<sup>st</sup> July maintaining 45 cm x 5 cm spacing. The experiment was laid out in factorial Randomized Block Design with six treatments replicated four times. Mulching with wheat straw @ 5 t/ha was applied 24 DAS in between crop rows. Furrows were opened 24 DAS. Land configuration treatments consisted of flat bed, ridges and furrows and opening of furrows after every two rows. Crop was harvested on 30<sup>th</sup> October.

### RESULTS AND DISCUSSION

The results of the present experiment as well as relevant discussions have been presented under following heads :

#### Effect of mulching :

The moisture content in soil from 0-30 cm depth was

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