



Effect of different nutrient levels and moisture conservation practices on total moisture content (%) of soil

KEYWORDS

Nutrient levels, insitu moisture conservation practices, soil moisture content

Pramila V. MoreM.Sc. Department of Agronomy,
Vasantrao Naik Marathwada Krishi
Vidyapeeth, Parbhani.**G. A. Bhalerao**Assistant Professor, Department
of Agronomy, Vasantrao Naik
Marathwada Krishi Vidyapeeth,
Parbhani.**Kote G. M**Assistant Professor, Department
of Agronomy, Vasantrao Naik
Marathwada Krishi Vidyapeeth,
Parbhani.**ABSTRACT**

An Agronomic investigation "Response of nutrient levels and insitu moisture conservation practices on growth, yield and quality of soybean" was carried out at Department of Agronomy, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani during Kharif 2013. Split plot design was used which consisted of nine treatment combinations comprising of three treatments of nutrient levels with three treatments of moisture conservation practices replicated three times. The soil moisture content was found to be more due to treatment N₃ (Rhizobium + RDF + FYM @ 5 t ha⁻¹) followed by treatment N₂ (RDF) during all growth stages of crop at the soil depths of 0-30 cm and 30 – 60 cm. Treatment M₂ (Opening of furrow in each row) recorded highest moisture content in soil followed by treatment M₃ (Opening of furrow in fourth row) during all growth stages of crop at the soil depths of 0-30 cm and 30 – 60 cm.

INTRODUCTION

The field experiment was conducted during *kharif* season of 2013-14 at P. G. Research Farm, Department of Agronomy, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. The soil of experimental plot was clayey in texture and slightly alkaline in reaction. The soil of the experimental plot was low in available nitrogen, medium in available phosphorus, very high in available potassium and low in organic carbon content. The present investigation was laid out in split plot design with three replications. The treatments comprised of three nutrient levels (N₁-Rhizobium + FYM @ 5 t ha⁻¹ FYM, N₂-RDF and N₃-Rhizobium + RDF + FYM @ 5 t ha⁻¹) as a main plots and three *insitu* moisture conservation practices (M₁ - Flat bed, M₂ - Opening of Furrow in each row and M₃ - Opening of Furrow in fourth row) as sub plots. Where, Rhizobium - Seed treatment @ 250 g per 10 kg seed and RDF - applied @ 30:60:30 NPK kg ha⁻¹.

After emergence of soybean, soil moisture observation were taken from the depth of 0-30 and 30-60 cm at 15 days interval. Soil samples for moisture studies were taken with the help of screw auger from each plot randomly. Soil from respective depth was thoroughly mixed to form composite samples. Then samples were transferred immediately to aluminium boxes and covered with polythene sheet to avoid sun heating in field. The soil samples from respective depth were weighed immediately on electrical top balance and 50 gm wet soil sample (W₁) was taken for drying and then transferred to hot air oven. The samples were dried at 105 °C ± 5 °C for 8-12 hours till constant weight was obtained (W₂). The moisture per cent was worked with gravimetric method as follows,

$$\text{Moisture per cent} = \frac{W_1 - W_2}{W_2} \times 100$$

Moisture content in soil at 0-30 cm depth (%)

Data on total moisture content of soil (%) as affected by

different nutrient levels and moisture conservation practices at various growth stages at the soil depth of 0-30 cm is presented in Table 1.

Data revealed that the total moisture content of soil was highest at 30 DAS thereafter it decreases gradually up to 60 DAS, then increased at 75 DAS and again decreased during harvest time.

Effect of Nutrient levels

The soil moisture content was found to be more due to treatment N₃ followed by treatment N₂ during all growth stages of crop except 30 DAS and the lowest one was observed in treatment N₁.

Effect of Moisture conservation practices

Treatment M₂ i.e. Opening of furrow in each row recorded highest moisture content in soil followed by treatment M₃ i.e. Opening of furrow in fourth row during all growth stages of crop except at 30 DAS, however lowest moisture content was recorded in treatment M₁ i.e. Flat bed sowing of soybean.

Moisture content in soil at 30-60 cm depth

The mean soil moisture content at 30, 45, 60, 75 DAS and at harvest are 48.23, 43.28, 33.52, 40.64 and 30.60 respectively (Table 2).

Effect of Nutrient levels

Data presented in Table 2 shows that the highest moisture content was observed in the nutrient treatment of N₃ followed by the treatments N₂ and N₁ during all growth stages of crop.

Effect of Moisture conservation practices

Data presented in Table 2 revealed that except at 30 DAS treatment M₂ i.e. Opening of furrow in each row recorded highest moisture content in soil followed by treatment M₃ i.e. Opening of furrow in fourth row and treatment M₁ i.e. Flat bed. Lowest moisture content was recorded in Flat bed sowing of soybean, except at 30 DAS.

Significantly higher moisture content in per cent was observed in the moisture conservation practice of M₂ (Opening of furrow in each row) than treatments M₃ (Opening of furrow in fourth row) and M₁ (Flat bed) at soil depth of 0-30 cm and 30-60 cm. The results are in line with the results of Shinde *et. al.* (2009) and Patil and Chorey (2009)

Table 1: Mean soil moisture content (%) at 0-30 cm depth as influenced by nutrient levels and *insitu* soil moisture conservation practices

Treatment	Days after sowing				
	30	45	60	75	At harvest
Nutrient levels					
N ₁ - Rhizobium + FYM @5 t ha ⁻¹	37.15	24.53	20.25	26.32	14.98
N ₂ - Recommended Dose of Fertilizer	39.62	24.81	20.81	26.64	15.03
N ₃ - Rhizobium + RDF + FYM @5 t ha ⁻¹	37.83	26.61	21.05	28.01	16.34
Moisture conservation techniques					
M ₁ - Flat bed	37.81	23.64	20.30	24.41	14.20
M ₂ -Opening of furrow in each row	38.90	27.68	21.63	30.30	20.12
M ₃ -Opening of furrow in fourth row	39.80	26.88	20.84	28.84	16.33
General mean	38.51	25.69	20.81	27.42	16.16

Table 2: Mean soil moisture content (%) at 30-60 cm depth as influenced by nutrient levels and *insitu* soil moisture conservation practices

Treatment	Days after sowing				
	30	45	60	75	At harvest
Nutrient levels					
N ₁ - Rhizobium + FYM @5 t ha ⁻¹	47.66	41.30	30.04	39.93	29.19
N ₂ - Recommended Dose of Fertilizer	48.98	42.69	31.16	40.55	28.23
N ₃ - Rhizobium + RDF + FYM @5 t ha ⁻¹	49.50	45.03	32.74	41.93	30.92
Moisture conservation techniques					
M ₁ - Flat bed	49.11	40.32	30.92	38.66	29.37
M ₂ -Opening of furrow in each row	47.81	46.69	40.57	42.62	34.76
M ₃ -Opening of furrow in fourth row	46.33	43.68	35.72	40.57	31.16
General mean	48.23	43.28	33.52	40.64	30.60

Literature cited:

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