

Short Communication

In-Situ Moisture Conservation in Soybean through Improved Sowing Methods under Drought Affected Bundelkhand Region of Madhya Pradesh

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In the context of Madhya Pradesh, and especially the Bundelkhand region, exposure to variable climatic conditions causes high physical vulnerabilities. The region being largely rain-fed, it is perturbed with variable precipitation trends. Drought conditions are frequent in the region, leading to unstable socioeconomic conditions. The varying temperature conditions influence the crop productivity in summers as well as in winters (due to frost). Monsoon is a critical determinant of the sowing time, which has been varying drastically in the past few years, causing big loss to farmers due to the paucity of correct and timely information

The trial was conducted at Datia, Chhatarpurand Tikamgarh districts of Bundelkhand, during the year 2013-14 to 2015-16 with two treatments as flat bed sowing method and Ridge and furrow method.

Soil moisture content on dry weight basis was determined randomly, the soil samples were taken from the test plots, at a depth of (0–15, 15–30, 30–45,) cm, the electrical balance was used for measuring the soil samples. The samples were placed in oven at 105°C for 24 hours. The dried soil samples were re-weighed in an electrical balance and the weight was recorded. The soil moisture percent (% dry weight basis) was calculated.

The recorded data were analyzed statistically according to RBD applied to find the treatment significance in field.

Non Significant variations were observed in percent emergence, apparently caused by different sowing methods as the data showed in table 1. Maximum percent emergence (67.93%) was observed in ridge and furrow sowing method in soybean, while the minimum emergence (64.00%) was observed in farmer practice i.e. Flat bed system of soybean. Maximum emergence percentage in soybean planted on ridge and furrow, may be due to the fact that method provided favourable environment i.e., optimum water and temperature for germination, while on the other hand soybean with flat bed sowing method has no satisfactory results because of the lowest germination. It could be due to the less available soil air and some time standing water at the time of emergence cause the hindrance for their growth and development. Plant height was significantly different across the soybean sown on different methods. Soybean sown on ridge and furrow method reached the highest plant height (72.68 cm) while soybean sown in flat bed method following local farmer's method attained the lowest plant height (65.07cm). It might be due to the fact that Soybean sown on ridge and furrow method covered only with a thin layer of soil and have

low competition for the light, nutrient and for space so emerged quickly and attained the highest stem height, while on the other hand soybean planted in flat bed system comparatively covered with thick layer of soil and the plant have more competition for space light and nutrient, so plant have compete for attain the suitable stem height.

Seed control efficiency influenced by method of sowing. Maximum WCH was recorded significantly in ridge and furrow method as compare to control plot (flat bed method) weed control efficiency was observed 71.75% with ridge and furrow method while the flat bed system of soybean sowing 62.45%. The higher weed control efficiency recorded highest in ridge and furrow method because in this method the space for cultural operation is more than flat bed system where the cultural operation space is find some difficulties.

The day to maturity of soybean has no significant effect of different sowing method because it is varietal character but some time it

is influenced by field condition. The maximum maturity period recorded with ridge and furrow method i.e. 87.78 days where as the flat bed system of planting take less time 86.19 days. The possible reason could be that the loosened surface fertile soil which augmented the day to maturity of crop.

The data regarding this parameter was also significantly affected by sowing methods. Sowing by flat bed method plain resulted the low yield per hectare (25.4 q/ha) showed poor results because the soil and nutrients were eroded leaving the plants root bear and less fertile soil. In case of ridge and furrow method of sowing find maximum yield per ha 29.74 q/ha which find significantly superior. It may be due to the reasons of good emergence, excellent plant spread and more number of stems per plant. Due to good plant spread, more area was exposed to sunlight. It increased photosynthesis and thus increased starch accumulation, which led to high yield^[1].

Table 1 Effect of different sowing method on soybean in Bundelkhand region

| | Emergence % | Plant height (cm) | Weed control efficiency | Day to maturity (days) | Yield q/ha | Soil moisture content |
|-----------------|-------------|-------------------|-------------------------|------------------------|--------------|-----------------------|
| | 64.00 | 65.07 | 62.45 | 86.18 | 25.4 | 15.99 |
| | 67.93 | 72.68 | 71.75 | 87.78 | 29.74 | 29.89 |
| S Em | NS | 0.732 | 1.661 | 0.576 | 0.903 | 0.425 |
| CD at 5% | NS | 2.175 | 4.936 | 1.713 | 2.682 | 1.264 |

The soil moisture content find significantly superior in case of different method of sowing method, find approx double in ridge and furrow method of sowing i.e. 29.89% and in farmer practice it was recorded

15.99% at the time of harvest in flat bed system. It may due to pores soil and the extra water retained in furrow and help to increase in water retention.

Reference

1. Kang JS, Singh Avtar and KaurMavinder. 2012. Studies on growth and yield of soybean (Glycine max L. Merrill) under different planting methods and fertility levels. Legume Research 35(3):265-267.