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INNOVATIVE PRACTISES OF SOYABEAN CULTIVATION FOR YIELD INCREMENT IN BEMETARA DISTRICT OF CHHATTISGARH

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Abstract

An experiment was carried on farmers field out during *Kharif* 2016-2017 at Bansapur village of Bemetara district of Chhattisgarh to explore the potential of Soybean productivity; reduce cost of cultivation by using Soybean ridge planter ;to save Soybean crop against water logging by adopting ridge furrow method and to protect Soybean crop from pest infestation by space planting. for this purpose was conducted in one block of Bemetara district of Chhattisgarh. Study revealed that in the production of Soybean, if we reduce quantity of seeds by half of the scientifically recommended quantity *i.e.* 30kg per hectare, productivity of the plants got double. If spacing is 10-12cm plant to plant and 45cm among rows, then plant gets more space to grow and hence profuse growth of root system occurs. More branches generally 9 branches per plant as a result of good growth in root system. More number of pods per plant *i.e.*, 150 per plants appeared as a result of more number of branches. Cultivation of Soybean in ridge furrow system not only helped plants to withstand against water logging conditions but also to grow rigourously. Yield recorded was 25-30 quintals per hectare which is more than 15 quintals per hectare in normal field conditions.

Key words: ridge furrow, yield increment, space planting

Introduction

Soybean (*Glycine max* L.) is of the most important oilseed crops globally (Chaudhary *et al*., 2014). Soybean is recognized as one of the premier crops around the world. It's a major source of vegetable oil, protein and animal feed. Due to high protein content (40-42%) and high oil content (18-20%), Soybean is considered to be an important food commodity. The Soya Protein is called complete protein because it supplies sufficient amount of amino acids.

Soybean is India's one of the fastest growing crops and a significant foreign exchange earner. With a humble start of meagre 0.44 million tonnes production in 1980-81; Soybean has become a major export earner today. Government started its Soybean development programme in 1960s; and there was a rapid expansion in acreage (24 fold increase) between 1972 and 1984. Yields per hectare also achieved significant growth in that period. (Anonymous 2017).

About 85% of the world's soybeans are processed annually into soybean meal and oil. Approximately 98% of the soybean meal is crushed and further processed into animal feed with the balance used to make soy flour and proteins. Of the oil fraction, 95% is consumed as edible oil; the rest is used for industrial products such as fatty acids, soaps and biodiesel. The major soybean producing nations are the United States, Brazil and Argentina. The three countries dominate global production, accounting for 80% of the world's soybean supply. Global production of Soybean has grown at a CAGR of 2.78% from 215.69 million metric tons in 2004-05 to 283.79 million metric tons in 2013-14. India has the fifth largest vegetable oil economy in the world. After cereals, oilseeds are the second largest agricultural commodity, accounting for the 14% of the gross cropped area in the country. However, country meets its edible oil demand through imports, which accounts for almost 50% of requirement. The per capita consumption of the vegetable oil is increasing very rapidly due to increase in population and improved economic status of the population. The demand has increased to about 12.6 kg/year compared to 4 kg/year in 1961 and the projected demand for the year 2020

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and 2050 is 16.443 and 19.16 kg/year respectively. To meet this demand, the country will require nearly 25.26 and 35.90 million tons of edible oil. In this scenario, soybean has played and will play a pivotal role in the future. Production of soybean in India is dominated by Maharashtra and Madhya Pradesh which contribute 89 per cent of the total production. Rajasthan, Andhra Pradesh, Karnataka, Chhattisgarh and Gujarat contribute the remaining 11 per cent production. (FICCI 2015).

Material and Methods

Chhattisgarh state consist 27 districts, out of which Bemetara district was selected purposively for the present study.

In Bemetara district experiment was carried on during *Kharif* 2017 at Bansapur village with following objectives

- to explore the productivity of soyabean crop
- to reduce cost of cultivation by reducing seed rate
- to save plants against water logging conditions by growing in ridge furrow system using soybean ridge planter.
- to protect the soybean crop from pest infestation by space planting

Selection of varieties was JS-2069 and JS-9305 based on their performances in field. Our experiment was carried out in area of 6.07 hectares & 8.03 hectares. This experiment was carried by sowing dates *viz.* 2 July 2017 & 4 July 2017 in consecutive fields .Seed rate is 30-35 kg per hectare which is far less than recommended practices *i.e.* 80-90 kg/ha. Seed treatment was done with cow urine at the rate of 2 litre for 30-35 kg/hectare. Spacing between plant to plant is 10 cm and row to row is 45 cm to 50 cm and inspection path is also kept 60 cm. After every 5 rows, there is path of 60 cm. The fertilizer dose N:P:K:S::1.33:4:1:1.75 were applied uniformly and recommended package of practices were adopted for optimum crop growth .Weedicide used Odyssey at the rate of 1.23 litre/hectare.

Results & Discussions

The study clearly shows that more quantity of seeds is not required to get more productivity of soybean but sufficient space is required. If quantity of seed was reduced to 30 kg/hec which is less than recommended practices, there is increment in yield of soybean. Also, plants get more space to grow and hence profuse growth of root system occurs. More number of branches are the results of good growth in root system. More number of pods per plants appeared as a result of more number of branches.

Cultivation in ridge furrow method system not only helped plants to stand against water logging situation but also helped it to grow rigourously. Yield attributing characters were observed from quadrant of 5 × 5 square meter area and taken thrice from the soybean field. Counts of pods per plant were observed in an area of 25 square meter and it was randomly selected from the field.

The higher yield, particularly in ridge and furrow system, can be accounted for the cumulative effect of yield attributing traits like- number of branches per plant, number of pods per plant, number of seeds per plant and 100-seed weight and rapid growth rates. Similar results were also noted by Raut *et al.* (2000) and Tomar et al. (2007).

Table 1 : Yield attributing character of soybean plants.

Plant height at harvest (cm)	Branches (No/plant)	Nodules (No /plant)	Pods (No/ plant)	Seeds (No/plant)
41.59	9	150	150	450
41.55	7	180	80	240
43.74	7	195	120	360
45.18	6	200	150	450
43.22	8	174	145	435
42.8	7	122	152	456

Average yield was 25-27 quintal per hectare which is very much profitive as there is less input cost, so cost of cultivation is also reduced but productivity is incremental.

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