

**Full Length Research Paper**

## Growth and Yield of Soya bean (*Glycin max*) as influenced by Biofertilizer and Chemical fertilizer.

Arjumand Banu .S.S<sup>1</sup>, Ananth Nag. B<sup>2</sup>, Neethu Patil<sup>3</sup> and Puttaiah, E.T<sup>4</sup>.

<sup>1</sup>Department of Environmental Science, Kuvempu University, Shankaraghatta 577415.

<sup>2</sup>Department of Environmental Science, Gulbarga University, Gulbarga- 585106

<sup>3</sup>SJBIT, Kengeri, Bangalore-06

<sup>4</sup>Vice-Chancellor, Gulbarga University, Gulbarga- 585106

**Corresponding Authors: Dr.Ananth Nag.B and Arjumand Banu. S.S.**

### ABSTRACT

The main and direct purposes of applying bio-fertilizers and chemical fertilizers to soil are: to provide nutrient sources and good soil conditions for the growths of crops. When produced annually, soybean is commonly rotated with other crops such as wheat, maize, rice, sorghum and sugarcane. The experiment was conducted to find out the influences of bio fertilizer and chemical fertilizer on growth and yield of Soya bean (*Glycin max* .I) The treatments were control and application of NPK 50 to 100 % and recommended dosage of Rhizobium, PSB (Phosphate Solubilizing bacteria) and FYM (farm yard manure). During the study it was noticed that the plant height, number of leaves, number of branches, and number of pods per plant and total yield the all parameters shows the maximum results in the treatment 6 T6(NPK, Rhizobium, PSB, FYM (Farm yard manure) and minimum in T1 control.

**Key Words:** Bio fertilizer, chemical fertilizer, Soya bean.

### INTRODUCTION

Soya bean (*Glycin max*) is a leguminous oilseed crop having world wide adaptation. It is know as “Golden bean” or “Miracal crop” of 20<sup>th</sup> century as it is the richest source of protein (40%) and oils (20%). Soya bean being rich source of amino acid, unsaturated fatty acids, vitamins and minerals are being widely used in different forms and acquires special importance in India and other Asian countries diet as a substitute to relive from hunger and malnutrition. Soya bean was introduced in India during 1880. Soya bean is globally grown over an area of 91.40 m. ha. with a production of 20.40 mt with a productivity 2233 kg per ha (Anon., 2004). Soya bean being a potentially high yielding crop can play a greater role in boosting oil seeds production in the country. The approximate composition of Soya bean is 40 to 45 % of protein, 18 to 20 % of edible oil, 24 to 26% of carbohydrate and good amount of vitamins (Koul and Das, 1986). In the view of the above the present investigation was under taken to find out the influence of bio- chemical fertilizer on the growth and yield of Soya bean.

### METHODOLOGY

The experiment was carried out during January-June, 2012. The experiment is carried out in randomize block design in three replications. The plots size is 1.8mx1.4m in length and width number of plots is eighteen and each plot is mixed with recommended dosage of both the type of fertilizer. Sowing process was carried out after mixing of both the type of fertilizers to the soil. Then the growth parameters is recorded on 20, 40, 60 days before harvest.

Online version available at: [www.crdeep.com](http://www.crdeep.com)

### Experimental details.

Design	=	Randomized block design.
Replications	=	Three (3)
Treatments	=	Six (6)
Total number of plots	=	Eighteen only (18)
Plots size	=	1.8mx1.4m
Space	=	30cmx10cm

### Treatment details

T1 =	Control
T2 =	NPK (Nitrogen, phosphorus, and potassium)
T3 =	Rhizobium
T4 =	Rhizobium + PSB (Phosphate stabilizing bacteria)
T5 =	NPK, Rhizobium, PSB.
T6 =	NPK, Rhizobium, PSB, FYM (Farm yard manure)

### RESULT

Influence of bio-fertilizer and chemical fertilizer on plant height in Soya bean is tabulated at Table.1.

**Table.1.** Variation of Plant Height (in cm) at each treatment

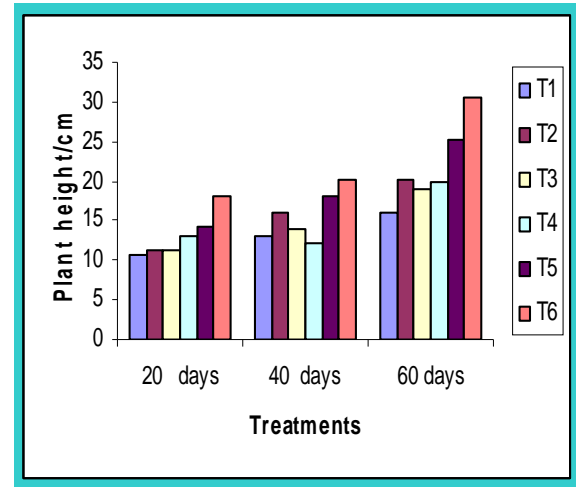
Treatment	20 days	40 days	60 days
T1	10.53	13.12	16.00
T2	11.14	16.14	20.13
T3	11.14	14.00	19.00
T4	13.14	12.12	20.00
T5	14.12	18.14	25.12
T6	18.01	20.22	30.58

In general plant height increased from 20days to harvest. The data is represented in the Table 1. Among the treatments the maximum plant height of 18.01cm, 20.22cm, and 30.58 cm at 20, 40 and 60 days after sowing was observed in the treatment that received NPK, Rhizobium, PSB, FYM in T6. Where as the lowest plant height 10.53cm, 13.12 cm, and 16.00 cm at 20, 40 and 60 days after sowing was noticed in control. The treatments T2, T3, T4 and T5 were on par with each other.

**Influence of bio-fertilizer and chemical fertilizer on number of branches in Soya bean is tabulated at Table.2.**

Treatment	20 days	40 days	60 days
T1	07	11	13
T2	10	14	20
T3	10	13	20
T4	11	13	20
T5	14	16	24
T6	18	20	30

In general number of branches increased from 20days to harvest. The data is represented in the Table 2. Among the treatments the maximum number of branches 18, 20, and 30 at 20, 40 and 60 days after sowing was observed in the treatment that received NPK, Rhizobium, PSB, FYM in T6. Where as the lowest number of branches 7, 11, and 13 at 20, 40 and 60 days after sowing was noticed in control. The treatments T2, T3, T4 and T5 were on par with each other.



**Influence of bio-fertilizer and chemical fertilizer on number of leaves in Soya bean is tabulated at Table.3**

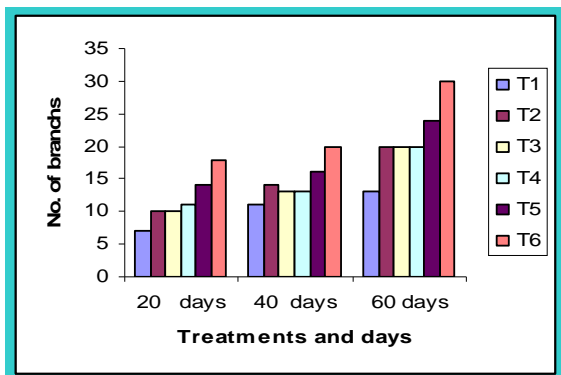
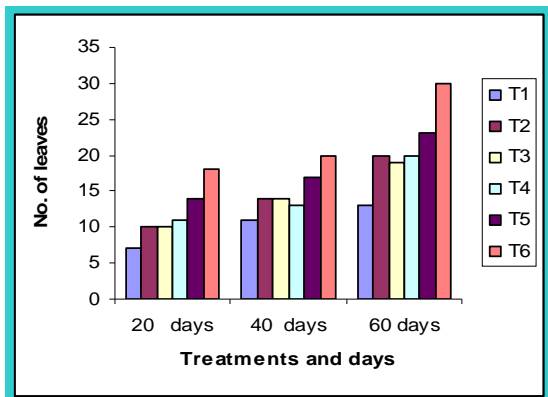
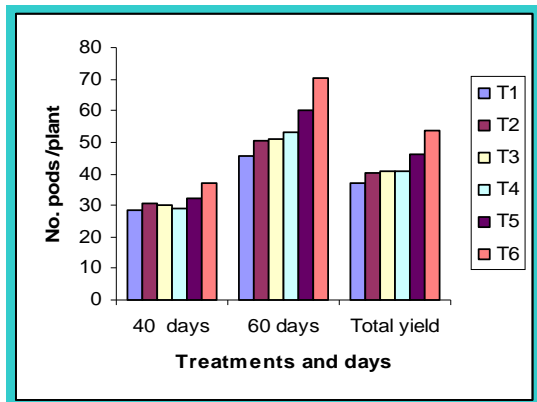
Treatment	20 days	40 days	60 days
T1	08	12	15
T2	10	14	20
T3	10	14.	19
T4	11	13	20
T5	14	17	23
T6	18	22	35

In general number of leaves increased from 20days to harvest. The data is represented in the Table 2. Among the treatments the maximum number of leaves 18, 22, and 35 at 20, 40 and 60 days after sowing was observed in the treatment that received NPK, Rhizobium, PSB, FYM in T6. Where as the lowest number of leaves 8, 12, and 15 at 20, 40 and

60 days after sowing was noticed in control. The treatments T2, T3, T4 and T5 were on par with each other.

**Influence of bio-fertilizer and chemical fertilizer on number of pods per plant in Soya bean is tabulated at Table.4**

Treatment	40 days	60 days	Total yield
T1	28.48	45.67	37.07
T2	30.45	50.33	40.39
T3	30.25	50.89	40.57
T4	29.25	52.89	41.07
T5	32.23	60.38	46.30
T6	36.89	70.45	53.67



In general number of pods increased from 40 days to harvest. The data is represented in the Table 2. Among the treatments

Online version available at: [www.crdeep.com](http://www.crdeep.com)

the maximum number of pods 36.89 and 70.45 at 40 and 60 days and total yield is 53.67g after sowing was observed in the treatment that received NPK, Rhizobium, PSB, and FYM in T6. Whereas the lowest number of pods 28.48 and 45.67 at 40 and 60 days and total yield is 37.07g after sowing was noticed in control. The treatments T2, T3, T4 and T5 were on par with each other.

## CONCLUSION

Beneficial effect of combined use of organics and inorganic increases crop yield as well as maintaining soil health on long term basis had also been reported by Mishra et al. (1990). Beneficial effect of FYM in conjunction with NPK may be the effect of organic matter in improving Physical, chemical and biological environment of soil conducive to better plant growth (Deshmukh et al., 2005). Srivastava and Ahlawat (1995) studies the response of P and biofertilizer and or PSB increased the yield (Sneha et al., 2004). According to Edward and Daniel (1992) if poultry manure was added in combination with chemical fertilizer, it supplemented all nutrient to crop, and increased the productivity of crop.

Result of the present study indicated that the increase in various plant growth characters such as plant height, no. of branches, no. of leaves and no. of pods ultimately results into increase in yield. This might be the reason responsible for spectacular increase in overall yield of soybean.

## REFERENCES

- Anonymous, (2004), Agricultural Statistics at a Glance. Directorate of Economics and Statistics, New Delhi.
- Deshmukh, K.K., Khatik, S.K. and Dubey, D.P., 2005, Effect of Integrated use of inorganic, organic and bio fertilizers on production, Nutrient availability plateau and Satpura hills. *J. Soil Crops*, 15:21-25.
- Edward, D.R., Daniel, T.C., 1992. A review on poultry manure. *Bioresour. Technol.* 41, 91-102.
- Kaul, A.K. Das, M.L. (1986) Oilseeds in Bangladesh. Bangladesh Canada Agriculture Sector Team, Ministry of Agriculture, Govt. of the People's Republic Bangladesh, Dhaka. p. 324.
- Mishra, R.C., Sabu, P.K., 1990. Response of soybean to nitrogen and phosphorus application. *J. Oil seed Res.* 7, 6-9. Muchow, R.C., 1988. Effect of nitrogen on the comparative productivity of maize and sorghum in a semi-arid tropical environment. III. Grain yield and nitrogen accumulation. *Field Crops Res.* 18, 31.
- Srivastava, T.K. and Ahlawat, I.P.S., 1995, Response of pea to Phosphorus, molybdenum and bio fertilizer. *India J. Agron.*, 40: 630-635