

Effectiveness of Farm yard Manure, Poultry Manure and Fertilizer –NPK on the Growth Parameters of French Bean (*Phaseolus vulgaris*) in Shimoga, Karnataka

Arjumand banu.S.S*, Ananth Nag.B¹ and Puttaiah, E.T¹

*Dept of Environmental Science, Kuvempu University, Shankaraghatta, Karnataka, India

¹Department of Environmental Science, Gulbarga University, Gulbarga-585106

¹Vice-Chancellors, Gulbarga University, Gulbarga-585106

*Corresponding Author : Ananth Nag.B

Abstract.

A field experiment was conducted to evaluate the manual potential of two organic manure :- Farmyard manure (FYM), Poultry manure (PM) vis-à-vis, 0% to 100% recommended dose of fertilizer – NPK and to find out the most productive cropping system at various combination of organic manure and chemical fertilizer. Field experiment was carried out for the period of six months January to June 2010, to determine the affect of organic and chemical fertilizer application on the growth parameters of French bean (*Phaseolus vulgaris*). During the study it was noticed that the organic manure enhanced the function of chemical fertilizer. The capital used for making organic manure is cheaper than that of chemical fertilizers and maintain the soil fertility.

Key words: French bean, organic manure, recommended dose of NPK, growth parameters.

Introduction

There are two types of supplies for agriculture, specifically fertilizer and pesticides. It can be said that the fertilizer is food and pesticides is medicine for plants in conventional agriculture. Soil fertility is diminishing gradually due to the erosion, loss of nutrients, accumulation of salts and other toxic elements and unbalanced nutrients compensation. Many efforts are being exercised to combat the adverse consequences of chemical farming (Faheed *et al.*, 2008). During the last decades French bean is becoming increasingly important as a cash bean Common bean or dry bean or snap bean, or French bean (*Phaseolus vulgaris*), is an important legume for human nutrition and a major protein and calorie source in the world. French bean is grown almost all over the India. It is grown in large scales for export especially Eghpt, Tanzania, Kenya, Uganda (Abdel – Mawgound *etal*, 2005) Bean crop requires nitrogen in quite high amount in the first stage of development for the emergence of the nodules and builds up of the symbiotic nitrogen fixation. The amount of nitrogen which symbiotically bound depends on the kind of plant, the efficiency of the bacteria inoculated and soil properties (Baldrice and Yilmaz; 2005). Common bean is sensitive to saline condition like many others leguminous crops where yield is reduced at salinity levels below 2 dsm (Subarao and Johansen, 1994, Lauchi, 1984.)The composition of French bean contains moisture 91.4, proteins 1.7, fat, 0.1, carbohydrates, 4.5 fibers, 1.8, and mineral matter 0.5%, Total number of plots =Eighteen only (18)

Plots size = 1.8mx1.4m

calcium, 50, magnesium. 29, phosphorus, 28 iron, 1.7 iron sable iron ,1.0,sodium,4.3, potassium 120, copper, 0.2,sulpher,37,and chorine,m10mg/100g.

Study Area

Shivamoga district lies between 13¹ 27⁰ and 14¹ 39⁰ north and 74¹ 38⁰ and 76¹ 4⁰ east. Shivamoga is a place known for its scenic beauty, lush green forest, eye catching water falls, and cool climate in the Malnad region.

Methodology

The experiment is carried out in randomize block design in three replications. The experiment was carried out during January to June 2010. The plots size is 1.8m x 1.4m 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 with PSB (Phosphate Stabilizing Bacteria) treated seeds of the crop.

Growth parameters is recorded on 20, 40, 60 days before harvest.

Experimental details.

Design =Randomized block design.

Replications = Three (3)

Treatments = Six (6)

Space = 30cmx10cm

Treatment details

T1=CONTROL

T2=NPK (50%) +FYM (5Kg /ha)

T3=NPK (100%) +FYM (5Kg /ha)

T4= POULTRY MANNURE (5Kg /ha)

T5=POULTRY MANNURE+NPK (50%)

T6=POULTRY MANNURE+ (100%) NPK

Results

Influence of farm yard manure and poultry manure and NPK on plant height in French bean is tabulated at Table.1

| Treatment | 20 days | 40 days | 60 days |
|-----------|---------|---------|---------|
| T1 | 8.46 | 17.51 | 17.65 |
| T2 | 12.41 | 25.00 | 27.08 |
| T3 | 16.73 | 30.42 | 32.18 |
| T4 | 12.89 | 26.99 | 29.13 |
| T5 | 15.47 | 28.56 | 30.11 |
| T6 | 19.14 | 37.68 | 38.69 |

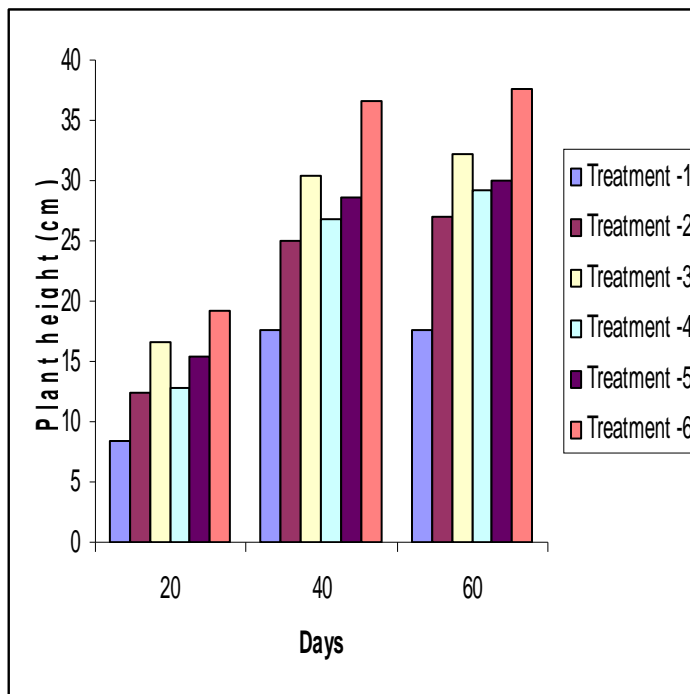


Table.1. Variation of Plant Height (in cm) at each treatment

In general plant height increased from 20days to harvest. The data is represented in the Table 1. Among the treatments T6 and T3 showed the maximum plant height in all the three stages and control was having the minimum however the treatments T6 and T3 were found

to be on par with each other and T2, T4 and T5 were on par with each other. Though the T6 recorded significantly higher plant height. Influence of farm yard manure and poultry manure and NPK on number branches in French bean is tabulated at table 2.

| Treatment | 20 days | 40 days | 60 days |
|-----------|---------|---------|---------|
| T1 | 2 | 2.9 | 3.6 |
| T2 | 2.63 | 4.26 | 6 |
| T3 | 3.65 | 4.46 | 9 |
| T4 | 2.90 | 4.1 | 6.98 |
| T5 | 3 | 4.1 | 7 |
| T6 | 3.6 | 7.01 | 11.01 |

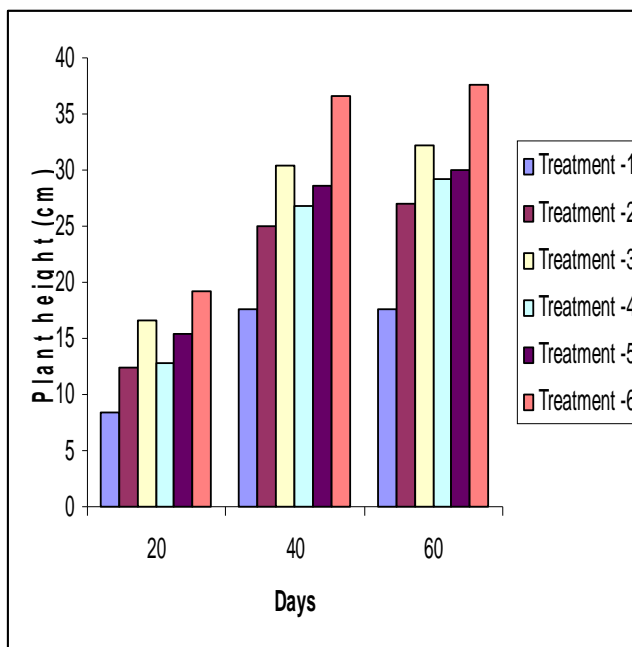


Table.2. Variation of Number of branches at each treatment

The data of number of branches is present in table 3. Among the treatment T6 and T3 recorded maximum number of branches at all the stages. The treatment T2, T4 and T5 were

significantly higher over control. Influence of farm yard manure and poultry manure and NPK on number of leaves in French bean at table 3.

| Treatments | 20 days | 40 days | 60 days |
|------------|---------|---------|---------|
| T1 | 2 | 4.62 | 3.54 |
| T2 | 2.80 | 6.01 | 6.25 |
| T3 | 4.01 | 7.96 | 8.29 |
| T4 | 3.24 | 6.17 | 7.3 |
| T5 | 3.9 | 6.95 | 7.9 |
| T6 | 5.6 | 8.1 | 10.1 |

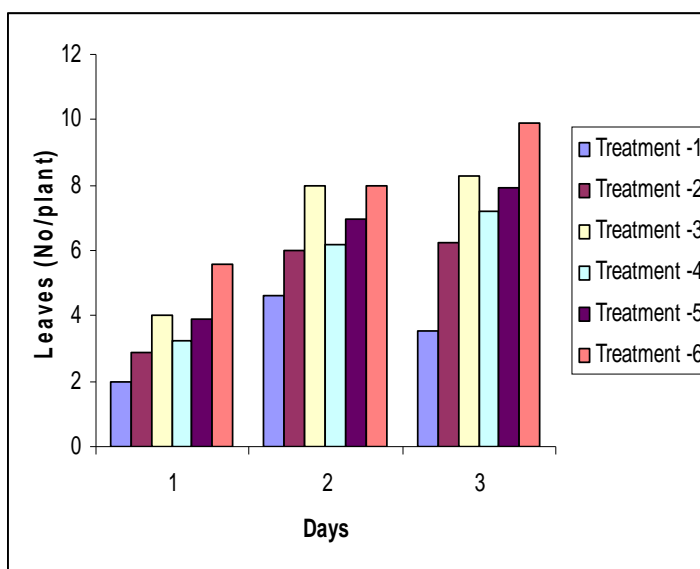


Table 3. Variation of number of leaves at each treatment.

The number of leaves present in table 3 indicated that it increased from 20 days to harvest. Among the treatments T3 and T6 recorded maximum number of leaves at all the stages.

The T6 and T3 were significantly higher over control while the treatments T2, T4 and T5 did not differ significantly among themselves.

Influence of farm yard manure and poultry manure and NPK on number of pods per plant in French bean at table 4.

| Treatment | Pods |
|-----------|-------|
| T1 | 5 |
| T2 | 10.1 |
| T3 | 12.08 |
| T4 | 10.7 |
| T5 | 11.6 |
| T6 | 14.4 |

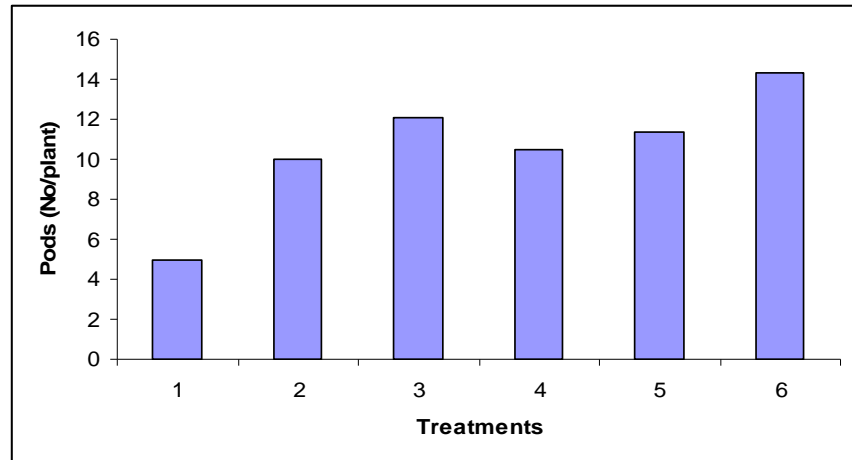


Table 4. Variation of number of pods per plant at each treatment

The number of pods per plant increased from 40 days to harvest is presented in the table 4. At 40 days T2, T4 and T5 did not differ significantly among themselves. While T6 and T3 were numerically higher than T1 and T2, similarly the T6 and T3 were on par with each other. At 60 days T2, T4 and T5 were on par with each other. At harvest the treatment T6 and T3 had the maximum number of pods per plant followed by T2, T4 and T5 were significantly higher over control.

Conclusion

Bio fertilizers are low cost, renewable sources of plant nutrients which supplements chemical fertilizer.

Beneficial effect of combined use of organics and inorganics increases crop yield as well as maintaining soil health on long term basis had also been reported by Mishra *et al.* (1990). Datt *et al.* (2003) reported that the application of FYM @ 10t/ha increased the green pod yields by 16 percent over control. 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. Bonde *et al.* (2004) reported that the incorporation of residue and FYM enhanced the soil available nutrients status.

In French bean grains yield was increased with an increase in irrigation and nitrogen along with FYM (Ramgopal *et al.*, 2003), Purushottam *et al.*, (2002) indicated that application of FYM (10t/ha) along with phosphorus resulted in higher pods per plant, seeds per pod and 1000 seed weight. Similar results were also reported by Jasrotia and Sharma (1999). Growth regulator can improve the physiological efficiency including photosynthesis ability and can enhance effective partitioning of the assimilates from source and sink in the field crops (Solaimalai *et al.*, 2001).

Result of the present study indicated that the application of Farm yard Manure and poultry manure and chemical fertilizer (NPK) had significantly influence on morphological character like plant height, number of branches, number of leaves and number of pods per plant. The application of growth promoting substance increased the plant height of such effect was due to the increase photosynthetic activities, enhancement in the mobilization of plants and change in the membrane permeability.

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