

Bio-fertilizer and Vermicompost: An Impact on Yield Attributes of Black Soybean (*Glycine max* L.)

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ABSTRACT

A field experiment was conducted at Himalayan University farm, Jullang, Itanagar, Arunachal Pradesh, during the *kharif* season of 2023 with 7 treatments replicated thrice in randomized block design, to determine the Bio- fertilizer and Vermicompost: An Impact on Yield Attributes of Soybean (*Glycine max* L.). The result revealed that treatments T₂ (Bio-fertilizer and Vermicompost) at the rate 100 kg/ha+ 40 cm x 15 cm was found to be the best treatments for obtaining higher yield (2.34 t ha⁻¹).

Key words: Black Soybean, Bio-fertilizer and Vermicompost

Introduction

Soybean (*Glycine max* L. Merrill) is a leguminous crop; it belongs to the family Leguminosae. It is rich in high quality protein (40-42%), oil (18-20%) and other nutrients like calcium, iron and glycine. It is a good source of is flavones. Soybean helps in preventing heart diseases, cancer, HIV etc. (Kumar, 2007). Soybean protein is rich in the valuable amino acid lysine (5%) in which most of the cereals is deficient. In addition, it contains good amount of minerals, salts and vitamins (thiamine and riboflavin). Its sprouting grains contain a considerable amount of vitamin C, minerals, salts, and vitamins (thiamine and riboflavin) (Singh *et al.*, 2003). Another advantage of soybean is that it improves soil fertility by fixing nitrogen from the atmosphere.

Materials and Method

Experimental Details

Name of Fertilizers

i) *Rhizobium* (ii) Vermicompost

Name of crop varieties

I) VL Bhat 201

Treatments combinations

- T₁ Control
- T₂ RDF 100% + *Rhizobium* + Vermicompost
- T₃ RDF 50% + *Rhizobium* + Vermicompost
- T₄ RDF 50% + *Rhizobium* + Vermicompost
- T₅ RDF 100% + *Rhizobium*
- T₆ RDF 50% + *Rhizobium* + Vermicompost
- T₇ RDF 100%+ Vermicompost

The experiment was conducted during *kharif* season of 2023 at Himalayan University. Itanagar. The farm is located in Jullang University campus. The experiment was laid out in Randomized Block Design with 7 treatments replicated thrice.

Yield and Yield parameters (unit)

The post-harvest observations are given below.

Number of pods plant⁻¹

Total numbers of pods plant⁻¹ within 1 m² of each plot was counted and average were taken for each treatments.

Number of seeds pod⁻¹

The total number of seeds pods⁻¹ from the five fresh pods was counted and calculated the mean of the number of seeds were counted in 3- replication with 5 pods each replication

Grain Yield (t ha⁻¹)

The green pods harvested from the net plot were weighted and expressed in t ha⁻¹

Results and Discussion

Number of Pods Plant⁻¹

The number of pods plant⁻¹ recorded at harvest is presented in table. The maximum number of pods plant⁻¹ was found to be statistically significant in treatment T₂ (RDF 100% + *Rhizobium* + Vermicompost) i.e., 61.66 and T₃ (RDF 50% + *Rhizobium* + Vermicompost) i.e., 56.33 was found to be statistically at par with T₂ (RDF 100% + *Rhizobium* + Vermicompost). Dhamak *et al* (2023).

Number of Seeds pod⁻¹

The number of seeds pod⁻¹ recorded at harvest is presented in table. The significant and highest grains pod⁻¹ was recorded and observed in treatment T₂ (RDF 100% + *Rhizobium* + Vermicompost) i.e., 3.22 and T₃ (RDF 50% + *Rhizobium* + Vermicompost) i.e., 3.00 was found to be statistically at par with T₂ (RDF 100% + *Rhizobium* + Vermicompost). Rahmani *et al*. (2007).

Grain Yield (t ha⁻¹)

The grain yield (t ha⁻¹) recorded highest was recorded in treatment T₂ (RDF 100% + *Rhizobium* +

Table 1. Effect of Biofertilizer and Vermicompost on yield attributes on black soybean

Treatments	No. of pods plant ⁻¹	No. of seeds pod ⁻¹	Grain yield (t ha ⁻¹)
T1	37.77	1.89	1.54
T2	61.66	3.22	2.34
T3	56.33	3.00	2.32
T4	49.44	2.44	2.24
T5	44.00	2.33	2.23
T6	47.66	2.77	1.98
T7	43.89	2.66	1.87

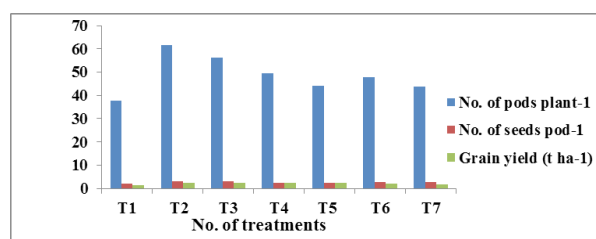


Fig. 1. Effect of Bio-fertilizer and vermicompost on yield attributes on black soybean.

Vermicompost) i.e., 2.34 t ha⁻¹ and T₃ (RDF 50% + *Rhizobium* + Vermicompost) i.e., 2.32 t ha⁻¹ was found to be statistically at par with T₂ (RDF 100% + *Rhizobium* + Vermicompost) Khare *et al*. (2016).

Conclusion

Based on research findings, it may be concluded that treatment T2 with (RDF 100% + *Rhizobium* + Vermicompost) has the best performance for obtaining higher crop yield (2.34 t ha⁻¹) Stover yield (1.34 t ha⁻¹), harvest index (50.87%), Seed index (23.95 g) and other growth and yield attributes. In future, if the more and more combinations of *Rhizobium* + Vermicompost should be made at commercial scale to get the maximum crop yield and income.

References

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