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Effect of different organic manure with Beejamrit inoculation on summer moong (*Vigna radiata* L.)

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Abstract

The present study aimed to evaluate the Effect of different organic manure with Beejamrit inoculation on summer moong (*Vigna radiata* L.) conducted during summer season 2021 at SGRRU Pathri Bagh Dehradun. The experiment was laid out into Randomized block design with 3 replication and 12 treatments namely T₀ Control, T₁ - 100% N Through FYM+ Beejamrit inoculation, T₂ 100% N through Vermicompost + Uninoculation, T₃ 100% N through Shivanskhad+ Beejamrit inoculation, T₄ 100% N through Neem cake+ Uninoculation, T₅ 50% N through FYM +50% Vermicompost+ Beejamrit inoculation, T₆ 50% N through FYM +50% Shivanskhad+ Uninoculation, T₇ 50% N through FYM +50% Neemcake+ Beejamrit inoculation, T₈ 50% N through Vermicompost + 50% Shivanskhad+ Uninoculation, T₉ 50% N through Vermicompost + 50% Neemcake+ Beejamrit inoculation, T₁₀ 25% FYM + 25% Vermicompost + 25% Shivanskhad +25% Neem cake+ Uninoculation, T₁₁ 25% FYM + 25% Vermicompost +25% Shivanskhad +25% Neem cake+ Beejamrit inoculation. The result revealed that application of T₅ 50% N through FYM +50% Vermicompost+ Beejamrit inoculation recorded significantly higher plant height(41.53cm), number of branches per plant (11.46) and dry weight (8.65g) as compare to rest of the treatment except control.

Keywords: Beejamrit inoculation, Shivansh khad, organic manure, vermicompost, neem cake

Introduction

In Asia, where 90% of the world's production currently takes place, the mungbean (*Vigna radiata* (L.) Wilczek) is one of the most significant food legumes. Total area protected at a yield of 694 kg/ha, the area under pulses in India was around 23 Mha, producing a total of 25.23 Mt. Mungbean cultivation covered 2.93 Mha in India in 2017–18, and 2.01 Mt were produced there (DASE 2018) [1]. According to Meena and Yadav (2015) [3] and Meena *et al.* 2020a [4], it produces on average just 436 kg/ha. Because pulse crops have a biological nitrogen fixation (BNF) mechanism built into them, they can meet 80–90% of their nitrogen (N) needs. Most pulse crops can therefore be supplied with a beginning dose of 15–25 kg N/ha. A few years ago, micronutrients such as zinc (Zn) and iron (Fe), pulse crop yield has increased significantly in many areas (Meena and Lal 2015) [3]. Organic sources that are useful for enhancing soil characteristics have been found to supply nutrients for a long time without negatively impacting the soil. Organic farming will produce high-quality food without having a negative impact on the environment or soil health (Yadav *et al.*, 2013) [5]. Application of organic manure maintains soil fertility while preserving the soil ecosystem through optimal soil biological activity (Meena *et al.* 2017) [6].

Compost and farmyard manure (FYM) are the most significant and popular bulky organic manures. Since FYM includes 0.5-1.5, 0.4-0.8, and 0.5-1.9 percent of N, P, and K, respectively, it feeds N, P, and K to the plant in an accessible form through mineralization.

All of the plant nutrients are abundant in vermicompost. When compared to FYM, it has a larger nutritional content. Both nitrogen fixation and P solubilization are aided by it. It is a rich source of nutrients including nitrogen (1.6%), phosphorus (0.54%), potassium (0.80%), calcium (0.44%), magnesium (0.15%), sulphur (0.45%), iron (175.2 ppm), zinc (24.43 ppm), organic carbon (9.5-17.98%), vitamins, and growth hormones that promote microbial population and plant growth.

A low-cost sustainable method called Shivansh Khad lessens reliance on damaging chemical fertilizers. It is prepared with weeds, dry plant material, wheat straw, rice husks, tree trimmings, and animal manure.

Composting is an 18-day process that turns agricultural waste into rich, black compost from raw ingredients.

Organic non-edible oil cake is sometimes referred to as neem cake. Neem cake contains 5.2% N, 1.0% P, and 1.4% K. It also serves as a nematocide. It reduces nitrification by acting as a nitrogen inhibitor. Long-term availability of nitrogen is provided to the soil through it.

Materials and Methods

The field experiment was conducted during summer season of 2020 at Shri Guru Ram Rai University Dehradun, Uttarakhand at the Crop Research Centre of School of Agricultural Sciences. The experiment laid out in Randomized Block Design consisting of 12 treatments T₀ Control, T₁ 100% N Through FYM+ Beejamrit inoculation, T₂ 100% N through Vermicompost + Uninoculation, T₃ 100% N through Shivansh khad+ Beejamrit inoculation, T₄ 100% N through Neem cake+ Uninoculation, T₅ 50% N through FYM +50% Vermicompost+ Beejamrit inoculation, T₆ 50% N through FYM +50% Shivansh khad+ Uninoculation, T₇ 50% N through FYM +50% Neem cake+ Beejamrit inoculation, T₈ 50% N through Vermicompost + 50% Shivansh khad+ Uninoculation, T₉ 50% N through Vermicompost + 50% Neem cake+ Beejamrit inoculation, T₁₀ 25% FYM + 25% Vermicompost + 25% Shivansh khad +25% Neem cake+ Uninoculation, T₁₁ 25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation. The city is located at 25.26-degree N latitude and 81.68-degree east longitude and 410 m above sea level. The experiment site was Sandy loam in texture with Ph-6.5, organic carbon (0.42%), available N (3.52%), available Phosphorus (7.1%), available Potassium (18.1%). Between germination to harvesting several plant growth parameters were recorded. In growth parameter plant height (cm), dry weight (g/m²) and number of branches per plant.

The data recorded for different characteristics were subjected to statistical analysis by adopted the procedure of Gomez & Gomez (1984)^[2].

Result and Discussion

Growth Parameters

Plant Height

At 60 DAS maximum plant height (41.53 cm) was recorded with T₅. 50% N through FYM +50% Vermicompost+ Beejamrit inoculation which was significantly superior over all other treatments and statistically at par with treatment of T₁₁- 25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation (39.17 cm) and T₂- 100% N through Vermicompost + Uninoculation (36.79cm).

Number of Branches per plant

At 60 DAS maximum number of branches per plant (11.46) was recorded with application of T₅. 50% N through FYM +50% Vermicompost+ Beejamrit inoculation which was significantly superior over all other treatments and statistically at par with treatment of T₁₁- 25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation (10.43) and T₂- 100% N through Vermicompost + Uninoculation (9.56).

Dry Weight

At 60 DAS, maximum dry weight (8.65 gm) was recorded with application of T₅. 50% N through FYM +50% Vermicompost+ Beejamrit inoculation which was significantly superior over all other treatments and statistically at par with treatment of T₁₁- 25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation (7.83 g) and T₂- 100% N through Vermicompost + Uninoculation (6.88g).

Treatments	Plant Height (cm)	Number of Branches per plant	Dry weight of plant (g)
Control	29.013	5.500	4.480
100% N Through FYM+ Beejamrit inoculation	35.757	8.417	6.373
100% N through Vermicompost + Uninoculation	36.790	9.567	6.887
100% N through Shivansh khad + Beejamrit inoculation	30.357	5.863	4.690
100% N through Neem cake+ Uninoculation	33.157	6.620	5.963
50% N through FYM +50% Vermicompost+ Beejamrit inoculation	41.537	11.460	8.650
50% N through FYM +50% Shivansh khad+ Uninoculation	31.643	6.043	5.077
50% N through FYM +50% Neemcake+ Beejamrit inoculation	32.763	6.520	5.597
50% N through Vermicompost + 50% Shivansh khad+ Uninoculation	34.327	7.427	6.127
50% N through Vermicompost + 50% Neem cake+ Beejamrit inoculation	32.043	6.253	5.470
25% FYM + 25% Vermicompost + 25% Shivansh khad +25% Neem cake+ Uninoculation	30.617	6.180	5.200
25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation	39.170	10.433	7.837
C.D.	1.588	0.578	0.282
SE(m)	0.538	0.196	0.095
SE(d)	0.761	0.277	0.135
C.V.	2.746	4.510	2.740

Conclusion

We concluded that all the treatments of different organic manures with Beejamrit inoculation on summer moongbean showed significant positive influence over control treatment in respect of growth parameters, treatment T₅. 50% N through FYM +50% Vermicompost+ Beejamrit inoculation T₁₁- 25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation and T₂- 100% N

through Vermicompost + Uninoculation perform comparatively better. Therefore, from the investigation T₅. 50% N through FYM +50% Vermicompost+ Beejamrit inoculation are recommended as the best organic manure with Beejamrit inoculation in summer moongbean.

Conflict of interest

The authors declare that they have no known competing

financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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