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Effect Of Organic Manure With Beejamrit Inoculation On Growth And Yield Parameters Of Summer Moongbean (*Vignaradiata*l.).

Garima Kaushik Parashar[1], Moinuddin[2]

[1*]Research Scholar Department of Agronomy, ShriGuru Ram Rai University
[2]Associate Professor Department of Agronomy, ShriGuru Ram Rai University

Abstract

A field experiment was carried out at Shri Guru Ram Rai University,Pathri Bagh Dehradun during the summer of 2022, 2023 and pooled with the goal of evaluating the Effect of organic manures with beejamrit inoculation on growth and yield parameters and of summer moongbean (*Vignaradiata* L.). The experiment consist of 12 treatments with three replications.The results showed that T_5 (50% N throughFYM +50% Vermicompost + Beejamrit inoculation) have showed significant increase in both growth and yield parameters in both the years and in pooled analysis as compare to other treatments. While there was a slight deviation in Harvest Index as in 2022 and in pooled analysis, maximum harvest Index showed by T_{11} (25% FYM + 25% Vermicompost +25% Shivanshkhad +25% Neem cake+ Beejamrit inoculation) and in 2023 maximum HI was showed by T_8 (50%N throughVermicompost + 50% Shivanshkhad+ Uninoculation).

Key words :Beejamrit, FYM, Growth, Moongbean, Neemcake, ShivanshKhad, Vermicompost, Yield.

Introduction

One of the most important food legumes is the moongbean (*Vignaradiata*L.*) Wilczek)*, which accounts for 90% of the world's production at the moment. The entire protected area for pulses in India was around 23 million ha, producing a total of 25.23 metric tonnes at a yield of 694 kg/ha. 2.93 million ha, of land were under moongbean agriculture in India in 2017–18, and 2.01 metric tonnes were produced there (*DASE 2018*). It yields just 436 kg/ha on average, according to *Meena and Yadav (2015*) and Meena et al. 2020. The majority of pulse crops can therefore be given a starting dose of 15–25 kg N/ha. It has been discovered that organic sources can feed nutrients for a very long time without having a detrimental effect on the soil and are effective for improving soil properties.High-quality food will be produced via organic farming without harming the environment or the condition of the land (*Yadav et al., 2013).*The application of organic manure increases soil fertility while preserving the soil environment by fostering healthy soil biological activity (*Meena et al. 2017*).*Rekha et al. (2018),*revealed that application of 10t FYM ha-1 gave maximum values of all the growth and yield attributes of green gram. Significantly higher value of growth parameters, yield attributes, yield and quality parameters were recorded with 10t FYM ha-1 application as compare to no FYM application.*Yadav et al. (2017),*revealed that application of vermicompost 2t ha-1 in chickpea recorded significantly higher plant height root nodules, number of root nodules, DMA, pods plant-1, test weight, seed yield and haulm yield.ShivanshKhad, a low-cost sustainable technique, reduces dependency on hazardous chemical fertilizers. Weeds, dried plant matter, wheat straw, rice husks, tree trimmings, and animal dung are used to prepare it. Composting takes 18 days method that uses natural elements to transform agricultural waste into rich, black compost.*https://kvk.icar.gov.in/API/Content*.Neem cake is another name for organic non-edible oil cake. There are 5.2% N, 1.0% P, and 1.4% K in neem cake. It works as a nematocide as well. As a nitrogen inhibitor, it reduces nitrification. Through it, nitrogen is made permanently available to the soil. *Katyayan.(2012).*Most often, beejamrit is used to treat seeds. Due to its resilience against fungus attacks from the earth and other seeds, the seed is substantially benefited. Beejamruth is a source of nutrient uptake that is used as a treatment for seeds or seedlings to promote germination and growth, according to *Palekar (2006).* The beneficial bacteria found in Beejamruthcan be used to inoculate seeds which increases seed vigor, length, and germination.

Material and Methods

This paper presents the materials and methodology used in the experiment titled “Effect of organic manures with beejamrit inoculation on growth and yield parameters of summer moongbean (*Vignaradiata* L.)” with a brief description of the experiment's site, sampling procedures, soil characteristics, climatic conditions during crop growth, cropping history, *etc.*

The field experiment was conducted during summer season of 2021, 2022 and pooled at Shri Guru Ram Rai University Dehradun, Uttrakhand at the Crop Research Centre of School of Agricultural Sciences.The city is situated 410 meters above sea level at 25.26 degrees north latitude and 81.68 degrees east longitude.The test site was sandy loam with a pH of 6.5, organic carbon content of 0.4%, available nitrogen of 3.52%, available phosphorus of 7.1%, and available

potassium of 18.1%. The experiment laid out in Randomized Block Design consisting of 12 treatments with three replicationsviz: T_0- Control, T_1 - 100% N ThroughFYM+ Beejamrit inoculation, $T_2$100% N through Vermicompost + Uninoculation, $T_3$100% N through Shivanshkhad+ Beejamrit inoculation, $T_4$100% N throughNeem cake+ Uninoculation,T_5-50% N throughFYM +50% Vermicompost+ Beejamrit inoculation, $T_6$50% N throughFYM +50% Shivanshkhad+ Uninoculation, $T_7$50% N throughFYM +50% Neemcake+ Beejamrit inoculation, $T_8$50%N throughVermicompost + 50% Shivanshkhad+ Uninoculation, $T_9$50%N throughVermicompost + 50% Neemcake+ Beejamrit inoculation, T_{10}25% FYM + 25% Vermicompost + 25% Shivanshkhad +25%Neem cake+ Uninoculation,T_{11}25% FYM + 25% Vermicompost +25%Shivanshkhad+25% Neem cake+ Beejamrit inoculation.Manual line sowing were used to sow the seeds, and they are immediately covered with dirt. FYM, Vermicompost, ShivanshKhad, Neemcake, and seeds injected with beejamrita were the nutrient sources. Irrigation was done because it was necessary.Several plant growth characteristics were tracked from germination through harvest. Plant height (in cm), dry weight (in g/m2), number of branches per plant, LAI, CGR, RGR, No.of branches was recorded. The yield parameters namely, no. of pods/ plant, no. of seeds/pods, seed yield (kg/ha), straw yield (kg/ha), test weight, harvest index (%). The approach developed by *Gomez & Gomez (1984)* was used to statistically analyze the data by using analysis of variance as applicable RBD.

Result and Discussion

A significant difference in all the growth parameters among treatments at 2021, 2022 and pooled was observed in tables. All the treatment showed a significant increase in growth parameters as compared to the control plot. In 2022 and 2023 the maximum plant height was observed as (44.69cm), (43.61cm), no. of branches (11.63), (11.01), dry weight (8.59g), (8.06g), LAI (2.47), (2.30), No. of nodules (24.83), (23.49), CGR (9.11), (8.18), RGR (0.069), (0.067), No. of pods per plant (37.57), (36.42), No. of seeds per pod (8.083), (6.890), straw yield (2086), (1918.25), seed yield (1013.66), (969.33), test weight (37.07), (36.85) by T_5(50% N throughFYM +50% Vermicompost + Beejamrit inoculation) In the year 2022, the Harvest index (37.66) by T_{11} (25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation) and(34.98) byT_8 (50% N throughVermicompost + 50% Shivanshkhad+ Uninoculation) in 2023, followed by T_{11}(25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation)plant height (43.69cm), (42.22cm), no. of branches (10.72), (9.53), dry weight (7.93g), (7.89g), LAI (2.39), (2.234), No. of nodules (23.75), (22.34), CGR (8.86), (7.76) RGR (0.065), (0.064), No. of pods per plant (36.193), (34.990), No. of seeds per pod (7.470), (6.340), straw yield (1978.223), (1826.94), seed yield (954), (941.33), test weight (36.76), (35.67). Harvest Index (32.69), by T_5 (50% N throughFYM +50% Vermicompost+ Beejamrit inoculation) in 2022 and (34.90) byT_1 (100% N Through FYM+ Beejamrit inoculation)in 2023.
In the pooled data analysis, T_5(50% N throughFYM +50% Vermicompost+ Beejamrit inoculation)showed maximum plant height (44.14cm), no. of branches (11.26), dry weight (8.32g), LAI (2.38), No. of nodules (24.14), CGR (8.60), RGR (0.068), No. of pods per plant (36.93), No. of seeds per pod (7.48), straw yield (2002.103), seed yield (991.50), test weight (36.93), while Harvest index (35.827) by T_{11} ((25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation),

followed by T_{11}(25% FYM + 25% Vermicompost +25% Shivansh khad +25% Neem cake+ Beejamrit inoculation) plant height (42.95cm), no. of branches (10.10), dry weight (7.88g), LAI (2.310), No. of nodules (23.03), CGR (8.30), RGR (0.064), No. of pods per plant (35.53), No. of seeds per pod (6.88), straw yield (1902.58), seed yield (947.66), test weight (36.208), Harvest index (33.39) by T_2 (100% N through Vermicompost + Uninoculation).

Table:1 Effect of organic manure with beejamrit inoculation growth parameters(2022,2023 & pooled) of summer Moongbean

Treatments	Plant Height			No. Of Branches			Dry Weight		
	2022	2023	Pooled	2022	2023	Pooled	2022	2023	Pooled
T_0	27.480	26.150	26.813	6.200	4.340	5.250	4.077	3.420	3.740
T_1	43.133	41.560	42.347	8.813	7.660	8.200	7.140	6.903	6.973
T_2	43.487	41.930	42.708	9.710	8.783	9.240	7.830	7.323	7.577
T_3	34.260	33.197	33.723	6.423	4.773	5.553	4.937	4.437	4.667
T_4	39.663	38.120	38.890	7.363	6.137	6.667	6.427	6.330	6.347
T_5	44.697	43.617	44.153	11.633	11.010	11.260	8.593	8.063	8.327
T_6	35.450	34.160	34.803	6.48	4.830	5.567	5.313	4.527	4.833
T_7	38.707	37.317	38.010	7.133	5.880	6.433	5.957	5.793	5.847
T_8	40.690	39.373	40.030	7.723	6.570	7.100	6.840	6.793	6.790
T_9	37.677	36.390	37.030	6.950	5.380	6.140	5.740	5.077	5.370
T_{10}	36.413	35.337	35.873	6.680	5.013	5.833	5.487	4.907	5.153
T_{11}	43.693	42.220	42.953	10.723	9.537	10.100	7.930	7.890	7.880
C.D.	0.896	0.846	0.776	0.314	0.390	0.227	0.182	0.202	0.119
SE(m)	0.304	0.287	0.263	0.106	0.132	0.077	0.062	0.068	0.040
SE(d)	0.429	0.405	0.372	0.150	0.187	0.109	0.087	0.097	0.057

C.V.	1.356	1.326	1.194	2.307	3.433	1.834	1.679	1.991	1.144

Treatments	No. Of Nodules			LAI			CGR 45-60			RGR 45-60		
	2022	2023	Pooled	2022	2023	Pooled	2022	2023	Pooled	2022	2023	Pooled
T_0	12.247	11.280	11.760	0.745	0.666	0.700	6.143	4.880	5.500	0.014	0.010	0.012
T_1	21.507	20.193	20.833	2.288	2.167	2.223	8.110	7.073	7.557	0.056	0.055	0.050
T_2	22.697	21.487	22.090	2.329	2.186	2.253	8.560	7.290	7.903	0.061	0.060	0.060
T_3	14.380	12.820	13.563	1.660	1.629	1.640	6.273	5.157	5.700	0.019	0.019	0.019
T_4	20.540	18.633	19.560	2.147	2.120	2.130	7.277	6.363	6.907	0.047	0.046	0.040
T_5	24.833	23.493	24.143	2.473	2.300	2.380	9.113	8.180	8.600	0.069	0.067	0.068
T_6	16.507	15.457	15.960	1.855	1.967	1.863	6.560	5.340	5.933	0.025	0.023	0.020
T_7	19.733	18.283	18.990	2.395	2.099	2.240	7.173	6.100	6.633	0.041	0.039	0.040
T_8	20.607	19.297	19.900	2.245	2.161	2.197	7.860	6.923	7.363	0.052	0.050	0.051
T_9	18.637	17.257	17.933	2.413	2.082	2.243	6.863	5.907	6.400	0.034	0.033	0.033
T_{10}	17.783	16.400	17.057	2.353	2.030	2.187	6.800	5.657	6.213	0.029	0.030	0.029
T_{11}	23.753	22.340	23.030	2.395	2.234	2.310	8.863	7.763	8.300	0.065	0.064	0.064
C.D.	0.353	0.639	0.430	0.342	0.076	0.181	0.138	0.183	0.110	0.002	0.002	0.002
SE(m)	0.119	0.216	0.146	0.116	0.026	0.061	0.047	0.062	0.037	0.001	0.001	0.001
SE(d)	0.169	0.306	0.206	0.164	0.036	0.087	0.066	0.088	0.053	0.001	0.001	0.001
C.V.	1.065	2.073	1.348	9.506	2.254	5.228	1.081	1.684	0.933	2.729	3.242	2.529

Table: 2 Effect of organic manure with beejamrit inoculation on yield parameters (2022, 2023 & pooled) of summer Moongbean

Treatments	Straw Yield(Kg/ha)			Seed Yield (Kg/ha)			Harvest Index		
	2022	2023	Pooled	2022	2023	Pooled	2022	2023	Pooled
T_0	1,420.310	1,356.480	1,388.393	518.667	465.667	492.167	26.740	25.537	26.137
T_1	1,892.620	1,648.460	1,770.537	873.333	884.000	878.667	31.567	34.907	33.235
T_2	1,923.767	1,726.247	1,825.007	917.000	910.000	913.500	32.273	34.527	33.398
T_3	1,518.797	1,391.313	1,455.000	635.333	523.333	579.333	27.153	27.317	27.233
T_4	1,796.903	1,549.500	1,673.200	818.000	807.333	812.667	31.270	34.250	32.757
T_5	2,086.000	1,918.253	2,002.103	1,013.667	969.333	991.500	32.690	33.560	33.123
T_6	1,599.683	1,442.230	1,520.930	680.000	635.000	657.500	29.830	30.560	30.195
T_7	1,737.067	1,518.753	1,627.887	781.667	775.000	778.333	31.023	33.777	32.397

T_8	1,844.380	1,578.063	1,711.220	846.000	849.333	847.667	31.433	34.980	33.203
T_9	1,694.643	1,503.653	1,599.113	734.333	741.333	737.833	30.217	33.013	31.613
T_{10}	1,621.920	1,477.677	1,549.797	709.000	708.667	708.833	30.403	32.407	31.403
T_{11}	1,978.223	1,826.947	1,902.580	954.000	941.333	947.667	37.667	33.993	35.827
C.D.	22.198	16.781	12.650	9.269	10.272	6.439	4.686	0.486	2.308
SE(m)	7.520	5.685	4.286	3.140	3.480	2.181	1.587	0.165	0.782
SE(d)	10.635	8.040	6.061	4.441	4.921	3.085	2.245	0.233	1.106
C.V.	0.740	0.624	0.445	0.688	0.785	0.485	8.862	0.880	4.271

Treatments	**No. Of Pods per plant**			**No. Of seeds per pod**			**Test Weight**		
	2022	**2023**	**Pooled**	**2022**	**2023**	**Pooled**	**2022**	**2023**	**Pooled**
T_0	22.487	21.347	21.910	3.103	2.213	2.657	31.263	30.410	30.803
T_1	32.110	31.117	31.567	5.770	4.920	5.343	35.817	34.577	35.177
T_2	33.473	32.530	32.967	6.460	5.580	6.017	36.143	35.137	35.613
T_3	23.527	22.423	22.900	3.350	2.963	3.153	31.947	31.460	31.633
T_4	28.987	27.897	28.433	4.897	4.197	4.517	34.477	33.863	34.150
T_5	37.573	36.420	36.933	8.083	6.890	7.483	37.070	36.853	36.933
T_6	24.030	22.880	23.430	3.653	3.123	3.387	32.140	31.900	31.987
T_7	27.390	26.187	26.767	4.430	3.933	4.180	33.893	33.183	33.500
T_8	30.380	29.090	29.667	5.160	4.600	4.877	35.330	34.180	34.733
T_9	26.017	24.907	25.400	4.043	3.670	3.843	33.190	32.853	32.963
T_{10}	24.717	23.840	24.267	3.920	3.280	3.600	32.730	32.420	32.500
T_{11}	36.193	34.990	35.533	7.470	6.340	6.887	36.760	35.670	36.207
C.D.	1.008	0.779	0.856	0.265	0.259	0.237	0.210	0.177	0.174
SE(m)	0.341	0.264	0.290	0.090	0.088	0.080	0.071	0.060	0.059
SE(d)	0.483	0.373	0.410	0.127	0.124	0.114	0.101	0.085	0.084
C.V.	2.045	1.645	1.775	3.093	3.524	2.982	0.360	0.310	0.302

Conclusion

Although all the treatments show significant influence over control treatment in respect of growth and yield parameters in 2022,2023 & pooled analysis, T_5(50% N throughFYM +50% Vermicompost+ Beejamrit inoculation) andT_{11}(25% FYM + 25% Vermicompost +25%Shivanshkhad+25% Neem cake+ Beejamrit inoculation)showed higher results in growth and yield parameters in both the years and in pooled analysis. When harvest Index was considered,T_{11}(25% FYM + 25% Vermicompost +25%Shivanshkhad+25% Neem cake+ Beejamrit inoculation) showed maximum results in 2022 and in pooled analysis but in 2023 T_8 (50%N throughVermicompost + 50% Shivanshkhad+ Uninoculation) treatments were found as the best. Therefore from the findings of the present evaluation, the treatments of T_5-(50% N throughFYM +50% Vermicompost+ Beejamrit inoculation) and T_{11}-(25% FYM + 25% Vermicompost +25%Shivanshkhad+25% Neem cake+ Beejamrit inoculation) are recommended as the best application input in moongbean.

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