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RESEARCH ARTICLE

Effect of combined application of composted pressmud, coirpith and farmyard manure on the yield and growth characteristics of green gram (*Vigna radiata* L.)

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SUMMARY

A field experiment was carried out at Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore for assessing the effect of composted coirpith, composted pressmud, farmyard manure and NPK on vegetative and yield parameters of green gram (*Vignaradiata* L.). On 25th day after sowing a significant increase in root length in T_2(composted coirpith), shoot length in T_5 (NPK 100%), number of leaves in T_7 (composted pressmud+50%NPK), number of nodules inT_4(FYM), fresh weight inT_{10}(composted pressmud+25%NPK) and dry weight in T_{11}(FYM + 25%NPK) was noted. On 45thday an increase in root length in T_{10}(composted pressmud+25%NPK),shoot length in T6(composted coirpith + 50%NPK), number of leaves in T_3(composted pressmud), number of nodules in T_4(FYM), number of flowers in T_8(FYM + 50%NPK), fresh weight in T_8(FYM + 50%NPK), dry weight in T_8(FYM + 50%NPK) was observed. On 55th day a significant increase in root length in T_5(NPK 100%), shoot length in T_3 (composted pressmud), number of nodules in T_3(composted pressmud), number of fruits in T_6 (composted coirpith + 50%NPK), fresh weight and dry weight in T_{12}(composted coirpith + composted pressmud + FYM) was observed. There was an increase in yield parameters number of pods/plant was increase in T_{11}(FYM +25%NPK), length of pods in T_{10}(composted pressmud + 25%NPK),weight of pods in T_{10}(composted pressmud+25%NPK), number of seeds / pod in T_5(NPK 100%), weight of seeds/pod in T_8(FYM + 50%NPK), pods fresh weight in T_{10} (composted pressmud +25%NPK) and pods dry weight in T_2(composted coirpith). The positive effect obtained from composted coirpith, composted pressmud and farmyard manure in this study favour the recycling of agrowastes for sustainable crop production.

Key Words : Green gram, Composted coirpith, Composted pressmud, Farm yard manure

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Green gram (*Vigna radiata* L.) commonly known as "mung bean" is one of the most important short duration pulse in India. Among the pulse green gram occupies 10.2 lakh hectares (4.3% of total) in India. Recycling of agro industrial wastes (press mud and coir pith) can bring tremendous benefits to agriculture and land management. It also gives a cleaner environment, a healthier habitat and an intelligent use of wastes. Treatment and reutilization of the agro industrial wastes in an effective way is an urgent need. The need of the hour is to improve soil health by providing the much needed organic matter. The use of organic matter and compost enhances soil organic carbon more than application of the same amount of nutrients as inorganic fertilizers.

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MATERIAL AND METHODS

The agro-industrial waste such as pressmud was collected from Bannari Sugars Private Limited Sathyamangalam and coirpith from Pollachi. Seeds of green gram and FYM were collected

from Tamil Nadu Agricultural University, Coimbatore. Using *Pleurotus Sajor Caju* the compost was prepared. The pots were filled with 7kg of sandy clay loam soil. The composts was applied to the respective pots and mixed thoroughly. Viable seeds were selected and five seeds were sown in each pot with three replications. After germination three healthy plants were maintained per pots. In this experiment composted coirpith, composted pressmud and FYM were incorporated in different concentration -T_1- Control, T_2- Composted coirpith (12.5t ha^{-1}), T_3- Composted pressmud(12.5t ha^{-1}), T_4- Farm yard manure (12.5t ha^{-1}), T_5- NPK (100%), T_6- Composted coirpith (12.5t ha^{-1}) + 50% NPK, T_7- Composted pressmud(12.5t ha^{-1}) + 50% NPK, T_8- Farm yard manure (12.5t ha^{-1}) + 50% NPK, T_9- Composted coirpith (12.5t ha^{-1}) + 25% NPK, T_{10}- Composted pressmud (12.5t ha^{-1}) + 25% NPK, T_{11}- Farm yard manure (12.5t ha^{-1})+25 % NPK, T_{12}-Composted coir pith (6.5t ha^{-1})+ Composted pressmud (6.5t ha^{-1}) + Farm yard manure (6.5t ha^{-1})

Statistical analysis :

The data obtained on 25 DAS, 45 DAS, 55DAS and 75 DAS were subjected to the statistical analysis and based on the results inference were drawn.

RESULTS AND DISCUSSION

Table results obtained from the present investigation are presented in Table 1, 2 and 3.

Effect of composted pressmud, composted coirpith and FYM on vegetative characters of green gram :

The treatments T_2(composted coirpith) showed increased root length on 25 DAS (13.47cm), T_{10} (composted pressmud + NPK) on 45DAS (16.67cm) and T_5 (NPK 100%) on 55DAS (18.44cm) when compared to the control (2.44cm, 5.67cm and 9.11cm) on 25.45 and 55 days after sowing, respectively. This is accordance with results of Kumarimani-muthuVeeral (2008) in maize. The significant increase in shoot length was obtained inT_5 (NPK 100%) on 25th (37.89cm) and T_6 (composted coirpith + 50%NPK) on 45th(47.32cm) days after sowing, T_3 (composted pressmud) on 55DAS (51.67cm) when compared to the control (24.56cm,18.67cm and 22.33cm) on 25, 45 and 55 days after sowing, respectively. As in the present study, an increase in the shoot length was also noted by Hossain and Ishimine (2007) in turmeric.

The number of leaves were highest in T_7(12.88), T_{12} (12.77), T_{11} (12.22) treatment than the control T_1(6.77), On 45DAS the number of leaves were increased in T_3 (20.77) treatment when compared to the control T_1(8.55).

On 25DAS the number of nodules were significantly increased in T_4 (0.88, 7.00) when compared to the control T_1 (0.11 and 0.22) on 25 and 45 days after sowing. On 55DAS the number of nodules was increased in T_3 (8.66) when compared to the control T_1 (1.44). Number of flowers was increased in T_8 (7.67) and T_9 (6.33) on 45DAS when compared to the control T_1 (1.00).

Number of fruits was increased inT_6 (5.67), T_{10} (5.00) on 55 DAS when compared to the control T_1 (1.33). This result is in agreement with findings of Pagaria and Totawat (2007). Plant fresh weight was increased in T_{10} (4.93g), T_{12} (4.82g).T_{11} (4.87g) on 25DAS, T_8 (11.62g) on 45DAS and T_{12} (63.54g) on55DAS than control T_1 (1.18g, 1.65g and 5.83g) on 25, 45 and 55 days after sowing, respectively. Plant dry weight was

Table 1 : Effect of composted pressmud, composted coir pith and farm yard manure on vegetative parameters of green gram

Treatments	Root length(cm)			Shoot length(cm)			Number of leaves			Number of nodules		
	25DAS	45DAS	55DAS	25DAS	45DAS	55DAS	25DAS	45DAS	55DAS	25DAS	45DAS	55DAS
T_1	2.44	5.67	9.11	24.56	18.67	22.33	6.77	8.55	14.66	0.11	0.22	1.44
T_2	13.47	10.67	12.78	30.67	34.44	36.78	7.00	12.66	8.33	0.33	0.33	2.88
T_3	6.56	5.78	12.56	36.44	43.78	51.67	7.11	20.77	8.77	0.66	0.33	8.66
T_4	11.38	13.40	11.67	36.44	35.56	42.44	9.33	10.66	10.66	0.88	7.00	1.66
T_5	13.37	6.74	18.44	37.89	45.56	48.44	8.00	10.66	10.88	0.55	0.22	1.77
T_6	9.40	11.44	9.39	28.00	47.32	43.67	9.66	10.55	11.55	0.66	0.22	1.77
T_7	8.44	8.38	11.41	27.89	35.00	46.89	12.88	11.55	14.11	0.55	3.66	1.55
T_8	10.44	14.56	9.78	25.00	44.40	45.22	10.88	10.44	11.11	0.44	1.44	3.00
T_9	6.46	14.78	14.89	31.44	31.56	34.22	7.55	13.44	10.88	0.44	2.88	2.77
T_{10}	10.34	16.67	14.27	32.89	46.78	42.89	10.44	11.00	13.11	0.44	1.55	3.88
T_{11}	8.67	9.44	10.78	37.78	43.33	45.67	12.22	13.00	13.44	0.33	2.00	3.55
T_{12}	9.56	10.33	17.11	36.67	46.89	38.44	12.77	11.55	11.11	0.55	0.55	3.66
S.E.±		0.24944			0.90865			0.34058			0.28706	
C.D (0.05)		0.49750			1.81226			0.67927			0.57253	
C.D.(0.01)		0.66051**			2.40607**			0.90184**			0.76013**	

** Indicate significance of value at P=0.01, DAS – Days after sowing

significantly high in T_{11} (2.04g), T_{10} (2.00g) on 25DAS T_8 (4.56g) on 45DAS and T_{12} (5.59g) on 55 DAS when compared to the control T_1 (0.47g, 0.36g, 0.45g). Similar result was given by Akhilandeshwari (2003) in green gram and soybean.

Effect of composted pressmud, composted coirpith and FYM on yield parameters of green gram :

Number of pods per plant was increased in T_{11} (4.77) when compared to the control T_1 (0.61). The length of pods was significantly increased in T_{10} (6.27cm), T_2 (6.24cm) and T_8 (5.78cm) when compared to the control T_1(0.62cm).

The weight of the pods increased significantly in T_{10} (4.92g) when compared to the control T_1 (0.57g). Similar was noted by Balakrishnan *et al.* (2009) and Umamaheshwari (2008) in soybean and cluster bean.

The number of seed per pod was significantly higher in T_5(8.22), T_{10}(8.00) and T_{11}(7.77) When compared to the control T_1(2.77). The weight of the seeds per pod was increased in the

Table 2 : Effect of composted pressmud, composted coirpith and farm yard manure on vegetative parameters of green gram

Treatments	Number of flowers	Number of fruits	Fresh weight (g)			Dry weight (g)		
	45DAS	55DAS	25DAS	45DAS	55DAS	25DAS	45DAS	55DAS
T_1	1.00	1.33	1.18	1.65	5.83	0.47	0.36	0.45
T_2	1.67	4.00	2.39	4.93	23.14	0.58	2.68	1.83
T_3	2.00	4.00	1.78	6.73	21.68	0.55	2.45	2.61
T_4	3.67	2.00	1.34	2.70	26.63	0.82	0.98	2.35
T_5	4.67	4.33	2.11	5.19	32.19	0.69	1.80	3.48
T_6	3.67	5.67	2.01	4.53	22.23	0.59	1.37	2.15
T_7	4.67	2.33	2.68	6.14	32.18	1.00	1.58	1.68
T_8	7.67	4.00	2.65	11.62	22.23	0.81	4.56	2.76
T_9	6.33	4.67	2.01	4.18	23.13	0.30	1.65	1.53
T_{10}	2.00	5.00	4.93	6.66	29.58	2.00	1.67	2.51
T_{11}	3.67	3.33	4.87	3.36	35.18	2.04	1.23	3.01
T_{12}	3.33	2.67	4.82	5.08	63.54	1.82	1.97	5.59
S.E.±	0.4714	0.4907		0.11534			0.06942	
C.D.(0.05)	0.9729	1.0127		0.23004			0.13845	
C.D.(0.01)	1.3258 **	1.3800 **		0.30541 **			0.18382 **	

** Indicate significance of value at P=0.01, DAS – Days after sowing

Table 3: Effect of composted pressmud ,coirpith, farm yard manure on yield parameters of green gram (75^{th} day)

Treatments	Number of pods/plant	Length of pods(cm)	Weight of pods(g)	Number of seeds/pod	Weight of seed/pod (g)	Pod's fresh weight	Pod's dry weight
T_1	0.61	0.62	0.57	2.77	0.03	0.05	0.11
T_2	2.74	6.24	2.25	7.22	0.57	1.35	0.65
T_3	3.65	5.37	2.38	3.77	1.33	3.26	0.14
T_4	3.73	4.78	2.40	4.33	0.41	2.26	0.06
T_5	3.61	5.68	3.12	8.22	2.13	3.12	0.46
T_6	2.78	5.26	0.67	3.11	0.22	0.54	0.55
T_7	2.67	5.32	2.67	7.11	1.42	2.67	0.12
T_8	2.72	5.78	3.56	6.66	4.37	3.57	0.22
T_9	1.68	5.21	1.61	5.33	0.20	1.62	0.37
T_{10}	2.76	6.27	4.92	8.00	3.46	4.93	0.03
T_{11}	4.77	5.75	3.37	7.77	1.77	3.34	0.12
T_{12}	3.27	5.77	2.72	6.09	1.59	2.71	0.25
S.E.±	0.0779	0.0706	0.0602	0.5379	0.8626	0.2419	0.0470
C.D.(0.05)	0.1617	0.1465	0.1248	1.1156	1.7889	0.5016	0.0974
C.D.(0.01)	0.2197 **	0.1991 **	0.1696 **	1.5164 **	2.4315 **	0.6818 **	0.1324**

** Indicate significance of value at P=0.01, DAS – Days after sowing

T_8(4.37g) when compared to the control T_1 (0.03g).

The pods fresh weight was increased in T_{10}(4.93g) when compared to the control T_1(0.05g).The results were in agreement with the findings of Chandrasekaran *et al.* (2007) in groundnut. The pods dry weight was highest in T_2 (0.65g) when compared to the control T_1 (0.11g). This is accordance with result of Muthuraju and Siddaranappa (2005).

Conclusion :

Disposal ofwaste material into the environment causes pollution, health hazards to the people and affects the crop productivity. Organic manures improve the physical, chemical and biological properties of the soil.

From the present investigation it has become evident that the composted pressmud, composted coirpith and FYM along with NPK influence the biometrical and yield characters of green gram. Hence it was concluded that the coirpith and pressmud on composting can be used as an organic manure substitute.

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