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Integrated effect of biofertilizers with composted sugarcane trash on productivity of green gram (*Vigna radiata* L.)

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SUMMARY

Fertilizer is one of the most important factors to increase the productivity of crops. High yield of modern agriculture are mainly dependent on chemical fertilizers. The present study is to analyze the effect of the interaction between different rates of organic fertilizer and biofertilizers. Biofertilizer has greater amounts of bacteria responsible for fixation of nitrogen. Composted sugarcane trash and biofertilizers were used in different treatment. On the 30th, 60th and 90th day of growth, results obtained proved that all the tested vegetative growth, and yield parameters were significantly increased in green gram. The highest values were recorded in treatments composted sugarcane trash alone and in combination with biofertilizers.

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Key words : Phosphobacteria, *Rhizobium*, Sugarcane Trash, *Vigna radiata*

India is an agricultural country where, about 80% of the land is used for agricultural purposes. Today fertilizer has become an indispensable input for intensive agriculture. The excessive use of fertilizers though increases crop production results in polluted environment and causes deterioration of soil health. Organic waste are composted in appropriate manner with suitable microbial inoculants and used as organic manure in crop production. This kind of conversion of waste materials into useful manure is helpful for conserving fertilizer resources as well as controlling environment pollution.

Green gram is an important world food crop which provide an inexpensive source of vegetable protein. It is an important traditional short duration high yielding dry season pulse crop which requires low inputs and serves as an excellent source of seed protein.

MATERIALS AND METHODS

The field study was conducted in Avinashilingam Deemed University.

The green gram seeds were collected from Tamil Nadu Agricultural University, Coimbatore. In experiments, composted sugarcane trash, biofertilizers like *Rhizobium* and Phosphobacteria were incorporated in different treatments.

T_1: Control, T_2: 12.5t/ha composted sugarcane trash, T_3: 25t/ha composted sugarcane trash, T_4: 12.5t/ha composted sugarcane trash + *Rhizobium*, T_5: 25t/ha composted sugarcane trash + *Rhizobium*, T_6: 12.5t/ha composted sugarcane trash + Phosphobacteria, T_7 : 25t/ha composted sugarcane trash + Phosphobacteria, T_8 : 12.5t/ha composted sugarcane trash+ Phosphobacteria + *Rhizobium* and T_9 : 25t/ha composted sugarcane trash+ Phosphobacteria + *Rhizobium.*

Statistical analysis:

The data obtained from the various biometrical observations and yield parameters were subjected to the statistical analysis and based on the results inference were drawn.

RESULTS AND DISCUSSION

The treatments showed a significant increase in the shoot length when compared with control. The highest value was obtained with T_9 (compost 25t/ha+ *Rhizobium* + Phosphobacterium).Thamizhvendan and Sheerin (1998) reported that combined application of *Rhizobium* and Phosphobacterium increased the shoot length of soyabean.

The treatments influenced a significant increased in the root length when compared with the control (8cms).The highest value was obtained in T_9 (11.67cm).

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The plant fresh weight and dry weight were increased significantly over control.The plant fresh weight and dry weight were highest in T_9 (6.57g fresh weight, 0.88g dry weight) when compared with the control (4.67g fresh weight, 0.53g dry weight). These results are in accordance with the results of Rahman and Bhuiyan (1994) who inferred that application of compost plus NPK improved the root growth of mung bean.

The plants treated with compost and biofertilizers showed a marked increase in number of lateral roots in comparison with control as shown in Table 1. Similar results were obtained by Sabanayagam and Savithri (1995).

A significant increase in root length was noted with the treatments which ranged from 22.67 cm (control) and 63.44cm (T_9) at 60 DAS. The shoot length at 60 DAS ranged from 27.67 cm (control) to 60.56 cm (T_9) (Table 2). The plants treated with composts and biofertilizers showed a marked increase in number of leaves when compared with control. Similar results were obtained by Sabanayagam and Savithri (1995) who found that the treatments with organic fertilizers recorded more number of leaves

A significant increase in number and volume of nodules was noted with the plants treated with compost along with biofertilizers when compared with control. Similar results were obtained by Vaishya and Dubey (1996), in which use of organic fertilizers significantly increased nodulation over control in legumes. There had been an increase in plant fresh weight which ranged from 2.56 g (control) to 6.5 g (T_9) and dry weight from 1.25 g (control) to 2.76 g (T_9) as shown in Table 2. The results obtained are in accordance with Gaur and Mukurjee (1979) in groundnut where application of straw increased the plant dry weight. Laddha *et al.* (1994) observed an increased in average weight of soyabean plant with application of fertilizers

A significant increase in pod length was noted with plants treated with compost and biofertilizers combination. The most significant increase was with T_9. Circumference of pod was significantly increased by composted sugarcane trash and biofertilizer treatment which varied

Table 1 : Effect of composted sugarcane trash and biofertilizers on vegetative parameters of green gram (30 DAS)

Treatments	Root length(cm)	Shoot length (cm)	No. of lateral roots	Plant fresh weight (g)	Plant dry weight (g)
T_1	8.00	24.67	11.0	4.67	0.53
T_2	8.17	25.61	12.67	5.28	0.66
T_3	8.78	25.67	14.00	5.61	0.71
T_4	9.33	26.11	14.00	5.55	0.70
T_5	9.78	26.89	14.00	5.78	0.76
T_6	10.00	27.17	14.00	5.83	0.76
T_7	10.56	27.83	17.00	6.22	0.77
T_8	11.11	28.39	17.00	6.39	0.84
T_9	11.67	29.11	17.00	6.57	0.88
S.E.±	5.42	14.97	8.11	3.17	0.41
C.D. (P=0.05)	0.08	0.03	0.08	0.06	0.09

Table 2 : Effect of composted sugarcane trash and biofertilizers ongreen gram flowering stage (60 DAS)

Treatments	Root length (cm)	Shoot length (cm)	No. of lateral roots	Number of nodules	Plant fresh weight (g)	Plant dry weight (g)
T_1	22.67	27.67	19.00	5.44	2.56	1.25
T_2	25.00	30.89	24.00	8.67	3.26	1.47
T_3	38.00	35.11	24.67	13.00	3.92	1.58
T_4	45.89	42.78	25.00	16.67	4.46	1.89
T_5	51.89	46.56	26.00	18.22	4.96	2.04
T_6	57.56	49.56	26.00	19.22	6.10	2.32
T_7	61.22	53.44	24.67	20.89	6.09	2.53
T_8	62.11	57.28	27.67	23.00	6.26	2.62
T_9	63.44	60.56	28.33	25.22	6.50	2.76
S.E.±	20.54	23.67	13.99	9.33	2.74	2.34
C.D. (P=0.05)	0.22	0.15	0.07	0.24	0.16	0.07

Table 3 : Effect of composted sugarcane trash and biofertilizers on yield parameters of green gram (90 DAS)

Treatments	Pod length (cm)	Pod circumference (cm)	No. of seeds/ pod	Weight of seeds/ plants(g)	Weight of 100 seeds (g)
T_1	4.63	1.51	11.44	1.93	2.79
T_2	5.50	1.69	12.00	2.38	2.79
T_3	6.04	1.77	13.00	2.41	2.80
T_4	6.34	1.89	14.33	2.80	2.82
T_5	6.14	1.97	14.78	2.70	2.83
T_6	6.36	1.72	14.44	2.78	2.80
T_7	6.14	1.77	14.44	2.99	2.82
T_8	7.02	2.08	15.33	2.85	2.84
T_9	7.32	2.13	15.67	3.06	2.85
S.E.±	3.45	1.03	7.79	1.48	1.80
C.D. (P=0.05)	0.09	0.06	0.06	0.09	-

from 1.51 cm (control) to 2.13cm (T_9).Similar results were obtained by Kumarawat *et al.* (1997) in soyabean. The number of seeds/pod was highest (15.67) at T_9. Similar results were obtained by Solaiappan and Ramiah (1990) where fertilizers increased the number of grains per pod in pigeonpea. All other treatments increased significantly when compared with control. Though all the treatments increased the weight of seeds/plant, the increase in T_9 was highest (3.06 g), when compared with the control (1.93 g). Treatment T_9 had a pronounced effect on the 100 seed weight (2.85 g) when compared to other treatments and control as shown in Table 3. Ramamurthy and Shivashankar (1996) observed similar results in soyabean.

Conclusion:

The result of this investigation indicated the influence of the application of composted sugarcane trash and biofertilizers on the crop productivity of green gram. Hence sugarcane trash after composting along with biofertilizers can be used as manure.

REFERENCES

Gaur, A.C. and Mukerjee, D. (1979). Note on the effect of straw on the yield of ground nut and the flowering wheat. *Indian J.Agric Sci.*, **49**(12): 984-987.

Laddha, K.C., Lavti, D.L. and Somani, L.L. (1984). Effect of organic matter addition and P fertilization on physical properties of sandy soil and yield of soyabean. Transaction of Indian society of desert tech. and universal center of desert studies, **9** : 1.

Sabanayagam, V. and Savithri, P. (1995). Coir pith as potting media for flowering plants under green house condition. Abstracts. National symposium on organic farming, TNAU, Madurai, Oct. 27-28 : 58-59.

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