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A comparative study on the impact of composted pressmud, rhizobium and indole acetic acid on biometric and yield parameters of cluster beans.

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ABSTRACT

Studies were carried out to assess the impact of composted pressmud alone and in combination with *Rhizobium* and Indole-acetic acid on cluster bean. A pot culture experiment was conducted in red soil with cluster bean seeds. The investigation included 5 treatments (T₁, T₂, T₃, T₄ and T₅) using various combinations of composted pressmud, *rhizobium* and Indole-acetic acid. A control (T₀) is maintained. The vegetative parameters like root length, shoot length, number of nodules, number of leaves, plant fresh weight and plant dry weight were significantly increased by all the treatments. T₅ (pressmud 5 mg + 1% IAA) was found to be most effective in increasing the biometric parameters. The yield parameters were significantly increased by all the treatments.

Keywords: *Pressmud, Rhizobium, Indole - acetic acid, Cluster beans.*

INTRODUCTION

Agriculture alone contributes about one-fourth of the gross domestic product (GDP) and is the source of livelihood for nearly two thirds of the population (Kanthimathinatha, 2007). Composting of farm, urban and industrial wastes saves environment through converting a wide variety of wastes into valuable agricultural inputs and minimize their becoming environmental problems. Composted pressmud contains valuable nutrients and is a very effective soil ameliorant. The nutrient availability of soil is improved after the application of *Rhizobium* in many dimensions. In view of this, the present work is carried out to assess the potential of composted pressmud alone and in combination with *Rhizobium* and Indole-acetic acid on biometric and yield parameters of cluster beans.

MATERIALS AND METHODS

Biocompost: Biocompost is humus rich organic manure prepared by mixing pressmud and water in the ratio of 1 : 2 pits of size 2x1½ m were used for composting. *Pleurotus sajor caju* was added. Water was sprayed twice a week for maintaining the adequate moisture level of 60 per cent. Fortnightly turning has been given for proper aeration. When compost becomes ready its physical appearance such as development of dark brown to black colour with uniformly disintegrated structure, the process can be stopped. After ripening and curing the compost is removed.

A pot culture study involving (cluster bean) *Cymopsis tetragonoloba* (L.) Var PNB as test crop was conducted in red sandy loam soil. 200 gms of the inoculants (*Rhizobium*) was mixed with 250 ml of cool rice kanji and a slurry is added over the seeds. The seeds were allowed to dry under shade for 30 minutes and sowed within 24 hours.

Treatment Details

- T₀ - Control
- T₁ - Pressmud 5 mg
- T₂ - Pressmud 2.5 mg + *Rhizobium*
- T₃ - Pressmud 2.5 mg + 1% IAA
- T₄ - Pressmud 5 mg + *Rhizobium*
- T₅ - Pressmud 5 mg + 1% IAA

Data were recorded on biometric and yield parameters and the potential of the compost pressmud alone and in combination with *Rhizobium* and Indole-acetic acid were analysed.

RESULT AND DISCUSSION

Biometric parameters (45 days) (Table 1): The root and shoot length showed a significant increase in all the treatments than the control. The result obtained showed a positive impact of pressmud on root and shoot length of cluster bean. The increased nutrient availability due to the application of pressmud in the soil would have produced such an increase in plant growth. This is in accordance with results of Devarajan and Rajannan (1993). Number of leaves and nodules increase in all the treatments given. A very significant increase were noted in treatment T₅ (composted pressmud + *Rhizobium* + IAA) which may be attributed to the available nutrients for the cause of boost in plant growth. On the 45th day the increase in plant fresh weight and plant dry weight was very significant in T₅ treatment than the control whereas there was slight increase in other treatments. As in the present increased growth due to compost application were reported by Prabhakaran and Ravi (1996) in soyabean.

Table 1: Influence of pressmud, *Rhizobium* and IAA on flowering stage of cluster beans (45 DAS).

Treatment	Shoot length (cm)	Root length (cm)	Number of leaves	Number of nodules	Plant fresh weight (g)	Plant dry weight (g)
T ₀	21.00	12.83	16.00	2.24	1.31	0.17
T ₁	26.60	15.43	17.66	2.81	1.54	0.21
T ₂	28.90	17.83	21.00	3.66	1.80	0.44
T ₃	30.90	23.60	24.83	5.33	2.07	0.62
T ₄	32.33	25.16	33.00	6.22	3.12	0.83
T ₅	34.26	26.83	35.50	6.66	4.59	0.85
SEd	0.49	0.51	0.87	1.73	0.17	0.00
CD (0.05)	1.03	1.05	1.80	2.52	0.35	0.01
CD (0.01)	1.40	1.43	2.45	3.59	0.48	0.02

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Yield parameters (Table 2): At the harvest stage the composted pressmud alone and in combination with *Rhizobium* and Indole-acetic acid has a positive influence on length and weight of the pods, number and weight of seeds per pod. Increase in crop yield may be attributed due to *Rhizobium*, IAA and phosphonitro composts which enhanced the decomposition process and produced well humified organic matter. This is in accordance with Anilkumar Singh *et al.* (2007) who reported that *Rhizobium* inoculation increased the yield of cowpea. Hence composted pressmud can be used as organic manure alone or in combination with *Rhizobium* and Indole-acetic acid to boost the growth of cluster beans.

Table 2: **Influence of Pressmud, *Rhizobium* and IAA at arvest stage of cluster beans (90 DAS).**

Treatment	Length of the pod (cms)	Weight of the pod (cms)	Number of seeds per pod	Weight of the seeds per pod (gms)
T ₀	5	1.00	5	0.12
T ₁	6	1.11	7	0.26
T ₂	7	1.61	8	0.32
T ₃	7.5	1.67	9	0.69
T ₄	8	1.75	9	0.70
T ₅	10	1.80	10	0.78
SEd	0.58	0.02	0.41	0.00
CD (0.05)	1.29	0.04	0.91	0.01
CD (0.01)	1.84	0.06	1.30	0.02

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Cluster beans (45 DAS).

Plant fresh weight (g)	Plant dry weight (g)
1.31	0.17
1.54	0.21
1.80	0.44
2.07	0.62
3.12	0.83
4.59	0.85
0.17	0.00
0.35	0.01
0.48	0.02