VOLUME 5(2) ● DECEMBER, 2010 ● RNI : UPENG/2006/18351 ● ISSN : 0973-4759

ASIAN JOURNAL OF ENVIRONMENTAL SCIENCE

An International Refereed Research Journal

AN OFFICIAL JOURNAL OF HIND AGRI-HORTICULTURAL SOCIETY

THIS JOURNAL IS THE COLLECTION OF ORIGINAL ARTICLES OF BASIC AND APPLIED RESEARCH IN ALL DISCIPLINES OF ENVIRONMENTAL SCIENCE

HIND INSTITUTE OF SCIENCE AND TECHNOLOGY
In assotiation with : HIND AGRI-HORTICULTURAL SOCIETY (REGD.)
MUZAFFARNAGAR-251 001 (U.P.) INDIA
Website : www.hindagrihorticulturalsociety.co.in

RESEARCH PAPER:

Integrated effect of biofertilizers with recycled sago waste and pressmu the yield of soybean and cowpea

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Asian Journal of Environmental Science, (December, 2010) Vol. 5 No. 2 : 16

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SUMMARY

A pot culture study was undertaken to study the effect of biofertilizers – *Rhizobium* and phosphob with recycled sago waste and pressmud on the yield characters of soyabean [*Glycine max* (L.) M and cowpea [*Vigna unguiculata* (L.) Walp]. The investigations included 10 treatments using v combinations of biofertilizers and biocomposts. Composted agrowastes applied individually combination with biofertilizers had increased the yield of soyabean and cowpea.

Vijayalakshmi, A. (2010). Integrated effect of biofertilizers with recycled sago waste and pressn on the yield of soybean and cowpea. *Asian J. Environ. Sci.*, 5(2):167-169.

Key words : Sagowastes, Pressmud, *Rhizobium*, Phosphobacteria

Recent years have witnessed renewed interest in microbial technique for composting of farm urban and industrial wastes. It saves environment by converting a wide variety of wastes into valuable agricultural inputs and minimize the environmental problems. The present investigation involves the utilization of agrowastes in combination with biofertilizers. To evaluate the efficacy of these composts, this research was carried out using soybean [*Glycine max* (L.) Merill] and cowpea [*Vigna unguiculata* (L.) Walp.] as the test crops.

MATERIALS AND METHODS

Pot culture experiments were carried out to study the yield characters of soybean and cowpea in red sandy loam soil. There were 12 treatments with three replications. The treatment details were T_1 – Control, T_2 – NPK 100%, T_3 – Raw sago, T_4 – Composted sago, T_5–Raw pressmud, T_6–Composted pressmud, T_7–Phosphobacterium, T_8–*Rhizobium*, T_9–Composted sago + Phosphobacterium, T_{10}–Composted pressmud + Rhizobium, T_{11}–Composted pressmud + Phosphobacterium and T_{12}–Composted pressmud + *Rhizobium.*

The agrowastes, sago waste and pressmud were applied at the rate of 12.5 t / ha and bio-fertilizers 10 g per pot. NPK were applied at the rate of 25, 50 and 40 kg / ha, respectively. Cultivation practices followed properly. On the 90th day, the follc parameters were studied : plant height, fresh weight, plant dry weight, number of / plant, number of seeds / pod, 100 seeds w and weight of seeds / plant.

RESULTS AND DISCUSSION

The results obtained from the pre investigation are presented in Tables 1 ai

The yield parameters of soybean cowpea were increased significantly du addition of biocomposts and biofertilizers. height of soybean increased significantly i treatment. A very significant increase in p fresh weight was noted in T_2 and treatments. Plant dry weight increased ir (20.7 g), T_7 (18.2 g), T10 (19.6 g), T_{12} (2(than the control. The number of seeds / increased in T_4, T_9, T_{10}, T_{11} and T_{12} treatme Treatments T_7 and T_{12} gave best results the weight of seeds per pod. (Table 1). increased yield is in accordance with the resi of Yadegari *et al.* (2008) in *Phaseo vulgaris* and Vaiyapuri *et al.* (2009) in soybe

Table 2 depicts the effect of biocompo and biofertilizers on the yield parameters cowpea. The maximum plant height w obtained in T_{11} treatment. The maximu increase in plant dry weight, number of pod plant, number of seeds / pod, weight of t seeds / pod and 100 seeds weight were not

Received: *November, 2010*
Accepted : *December, 2010*

ble 1 : Effect of raw and composted sago, pressmud and biofertilizers on soybean (90 days)

eatments	Plant height (cm)	Plant fresh weight (g)	Plant dry weight (g)	Number of pods / plant	Number of seeds / pod	100 seed weight (g)	Weight of seed / plant (g)
	116.2	44.9	10.3	15.7	2.1	11.6	4.0
2	159.8	69.9	20.7	27.7	1.9	9.5	3.6
3	145.2	60.2	12.6	21.5	2.1	10.0	2.6
4	182.7	63.1	15.8	41.8	2.1	10.5	4.2
5	177.9	55.2	11.2	37.0	2.0	10.3	3.5
6	176.7	60.7	12.0	45.0	2.0	13.3	4.9
7	136.1	67.1	18.2	25.7	2.0	10.0	6.1
T_8	142.4	65.5	14.4	26.0	2.0	10.8	5.2
T_9	165.7	65.3	19.4	43.0	2.0	11.7	5.6
T_{10}	174.6	66.5	19.6	50.7	2.1	11.1	5.0
T_{11}	175.1	64.6	13.5	51.0	2.0	11.2	4.7
T_{12}	178.7	69.7	20.0	49.5	2.1	11.5	6.4
S.E.±	10.767	7.433	2.183	4.452	0.117	4.626	0.519
C.D. (P=0.05)	32.829	22.664	6.655	13.576	0.358	14.106	1.581

Table 2 : Effect of raw and composted sago, pressmud and biofertilizers on cowpea (90 days)

Treatments	Plant height (cm)	Plant fresh weight (g)	Plant dry weight (g)	Number of pods / plant	Number of seeds / pod	100 seed weight (g)	Weight of seed / plant (g)
T_1	95.6	17.9	3.5	3.3	30.3	8.7	2.3
T_2	107.6	27.9	5.6	5.3	52.5	12.0	5.6
T_3	103.8	17.8	5.7	3.8	40.2	9.7	3.5
T_4	107.2	18.3	6.0	4.2	42.7	9.9	3.9
T_5	95.8	20.0	4.5	4.0	47.2	11.6	4.3
T_6	104.3	21.7	6.2	4.3	52.0	12.1	4.4
T_7	100.0	21.2	5.8	4.4	48.3	11.9	3.6
T_8	105.0	22.3	5.7	4.0	44.7	11.7	3.4
T_9	104.1	25.4	5.9	4.0	49.7	11.8	4.2
T_{10}	106.1	33.8	7.4	4.2	50.3	11.9	4.3
T_{11}	109.4	29.4	5.3	4.0	50.2	11.6	4.1
T_{12}	106.8	34.5	8.3	4.5	52.7	12.7	4.6
S.E. ±	4.405	4.929	1.395	0.902	8.392	0.400	0.448
C.D. (P=0.05)	13.432	15.030	4.253	2.750	25.589	1.220	1.366

in T_{12} treatment when compared to the control. During degradation, the available nutrients increased and this is the reason for maximum significant increase in yield of soybean and cowpea. This result is in accordance with Natarajan (2001) who reported that the compost was superior in its macronutrients and micronutrients. The composts applied individually and in combination with biofertilizer gave a significant increase in yield. This results is in agreement with Singh *et al.* (2007) and Rathi *et al.* (2009) who reported that *Rhizobium* inoculation increased the yield characters of cowpea.

The addition of composted pressmud and sago with biofertilizers not only increased the yield of legumes but also will gain advantages in soil fertility to overcome the fertilizer bill and pollution hazards.

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