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SHORT COMMUNICATION

Integrated effect of farm yard manure and sugarcane trash on seedling growth of greengram (*Vigna radiata* L.)

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ABSTRACT

Agro-wastes have been used to benefit crop production by improving soil fertility, increasing soil organic matter and reducing the incidence of plant disease. Various combinations of agro-wastes were used in the present studies to analyze the effect of farm yard manure (FYM), sugarcane trash, NPK, ligno-cellulolytic fungi and urea. The sugarcane trash was composted alongwith *Pleurotus sajor caju* (150 g), *Trichoderma* (150 g) and 5 kg urea. The seeds of *Vigna radiata* were soaked at different concentrations of compost extract and farm yard manure (FYM) for 12 and 24 h. The root length of the greengram seedlings was markedly increased with 10% FYM in 12 and 24 h treatment. The shoot length increased significantly in 25% composted sugarcane trash in treatment 12 and 24 h. The higher numbers of lateral roots were recorded in 10% composted sugarcane trash and 10% FYM. A significant increase in dry and fresh weight of the seedling was noted with 25% FYM and composted sugarcane trash combination.

Key words : *Pleurotus sajor caju*, sugarcane trash, *Trichoderma, Vigna radiata*

The waste biomass from domestic, agriculture and urban and industrial source is the main cause of organic pollution in developing counries like India. All these wastes cannot be applied directly as such into the soil because of their wide C : N ratio. To overcome such problem, these organic wastes are composted in appropriate manner with suitable microbial inoculants and used as organic manure in crop production.

The amount of sugarcane trash available in India averages to about 6.7 t/ha and is an inexhaustible energy source considering its renewal character (Goel, 1999). At present cane trash is utilized as fuel, gur making, thatching and remaining quantity is disposed off by burning. The raw sugarcane trash is not a practice due to its wide C : N ratio, cellulose and lignin contents. This can be effectively composed by using microbial inoculants.

Therefore, in the present investigation, sugarcane trash, which is available in a bulk in the sugarcane field, is composted effectively using pure and mixed culture of micro-organisms. The effects of these composts were studied on the seedling growth of greengram (*Vigna radiata* L.).

The study was conducted to analyze the effect of farm yard manure (FYM), sugarcane trash, nitrogen, phosphorus, potassium, ligno cellulolytic fungi, urea and fertilizer on growth and yield of greengram (*Vigna radiata* L.).

For composting one tonne of sugarcane trash, the trash was chopped initially and composted alongwith Pleurotus (150 g), Trichoderma (150 g) and 5 kg urea. During the process of composting, moisture level was maintained and subsequent turning was done at 10 days interval for 60 days.

The seeds of *Vigna radiata* were soaked at different concentrations of compost trash extract and FYM extract for 12 and 24 h.

The treatments were :
T_1 : Control
T_2 : 2.5% composted sugarcane trash
T_3 : 5% composted sugarcane trash
T_4 : 10% composted sugarcane trash
T_5 : 10% FYM
T_6 : 2.5% FYM+2.5% composted sugarcane trash
T_7 : 5% FYM+2.5% composted sugarcane trash
T_8 : 10% FYM+2.5% composted sugarcane trash

In sugarcane trash, mostly nitrogen,

phosphorus, potassium and organic carbon were present. Before composting the sugarcane trash, the percentages of nitrogen, phosphorus and potassium were very low, namely, 0.17, 0.12 and 0.11. After composting, the percentage of nitrogen, phosphorus and potassium increased by 0.70, 0.25 and 0.70. Raw sugarcane trash had high percentage of organic carbon and C : N ratio, namely, 24.2 and 142.4 : 1 but after composting it decreased to 17.0 and 24 : 1 as shown in Table 1.

The results pertaining to the seedling growth of greengram (12 and 24 h) are given in Tables 2 and 3. The root length of greengram seedlings was markedly increased by 14 cm with 10% FYM extract (when soaked for 12 h) compared with the control 10.69. The shoot length increased in 2.5% composted sugarcane trash (13.75 cm) when compared with the control 9.75 cm. The shoot length also increased with 5% composted sugarcane trash treatment.

The higher numbers of lateral roots were recorded with 10% composted trash and 10% FYM combination. A significant increase in fresh weight (0.42 g) and dry weight (0.2 g) of the seedlings was noted with 2.5% FYM and composted sugarcane trash combination.

The present study is in agreement with that of Vidhyarani (2000) who reported that compost extracts of sugarcane trash influenced the growth of shoot, root, number of lateral roots and fresh weight of seedlings of soybean and greengram.

Table 1. The nutrient contents of raw and composted sugarcane trash

Nutrient contents	Initial (raw) (%)	Composted sugarcane trash (%)
Nitrogen	0.17	0.70
Phosphorus	0.12	0.25
Potassium	0.11	0.70
Organic carbon	24.2	17.0
C : N ratio	142.4:1	24 :1

Table 2. Influence of sugarcane trash, compost and farm yard manure on seedling growth of greengram (12 h soaking)

Treatment	Root length (cm)	Shoot length (cm)	No. of lateral roots (cm)	Fresh weight (g)	Dry weight (g)
T_1	10.69	9.75	3.13	0.17	0.1
T_2	12.50	13.75	3.25	0.36	0.2
T_3	13.88	13.44	3.25	0.35	0.1
T_4	12.56	11.56	3.13	0.28	0.1
T_5	14.00	10.75	3.50	0.41	0.1
T_6	14.63	12.50	3.50	0.42	0.2
T_7	11.75	11.81	3.13	0.29	0.1
T_8	12.88	10.31	3.88	0.31	0.1
S. Ed	7.53	7.02	1.88	0.12	0.08
C. D.	0.05	0.07	0.05	-	0.2

Table 3. Influence of sugarcane trash, compost and farm yard manure on seedling growth of greengram (24 h soaking)

Treatment	Root length (cm)	Shoot length (cm)	No. of lateral roots (cm)	Fresh weight (g)	Dry weight (g)
T_1	10.40	12.80	1.8	0.12	0.1
T_2	13.10	13.50	2.8	0.22	0.19
T_3	12.20	13.00	3.2	0.18	0.18
T_4	12.40	13.30	4.4	0.16	0.12
T_5	15.10	13.20	4.4	0.16	0.1
T_6	11.20	13.40	4.0	0.18	0.1
T_7	14.90	15.10	4.0	0.19	0.2
T_8	12.50	15.20	2.6	0.12	0.1
S. Ed	7.90	8.44	1.68	-	0.09
C. D.	0.07	0.05	0.2	-	0.11

The root length of greengram seedlings increased in 10% FYM extract (15.10 cm, when soaked for 24 h) when compared with the control (10.40 cm).

The shoot length increased by 13.50 cm with 2.5% composted sugarcane trash treatment when compared with the control 12.80 cm. The shoot length increased with 5% composted sugarcane trash treatment. The highest number of lateral roots was recorded with 10% composted trash and 10% FYM combination.

A significant increase in fresh weight (0.22 g) and dry weight (0.18 g) of the seedlings was noted with 2.5% FYM and composted sugarcane trash combinations.

Similar results were reported by Rasal *et al.* (1989) in sugarcane where increased germination percentage was obtained with trash incorporation.

The increase in available nutrient content in soil with trash has been reported by Srivastava and Prakash (1990).

CONCLUSION

This research is to brighten the possibilities of using sugarcane trash in increasing crop productivity of agricultural crop. The present investigation was underaken to find out means and solution for the profitable utilization of sugarcane trash and to reduce its environmental hazards.

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