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Application of composted coirpith at different times on the nutrient uptake and yield of rice (*Oryza sativa*)

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Of the various organic agricultural wastes, coirpith is one which has immense potential of supplementing the nutritional requirements of crops (Ramaswami and Kothandaraman, 1985). Higher yield of rice with composted coirpith at 12.5 tonnes/ha was reported by Clarson (1983), Nagarajan *et al.* (1986), Kandiannan (1988) and Ganapathi (1991), but there is lack of sufficient information on the pattern of yield and nutrient uptake by rice when coirpith composted for different periods is to be applied to the soil. Therefore field experiment was conducted with 'ADT 36' rice (*Oryza sativa* L.) during the rainy season at Agricultural College Farm, Madurai, on sandy-clay loam soil (Typic Haplustalf), neutral in reactions (pH 7.9) having low soluble salts (electrical conductivity 0.1 dS/m).

The experiment laid out in randomized block design with 4 replications consisted 8 treatments (Table 1). Coirpith was applied basally @ 12.5 tonnes/ha and incorporated well into the soil 2 days before planting. All the plots received a common dose of 120 kg N/ha through urea and 60 kg P_2O_5/ha as superphosphate and 60 kg K_2O/ha in the form of muriate of potash. Half of N and full dose of P_2O_5 and K_2O were applied basally. The remaining half of N was applied in 2 equal splits (one at maximum tillering and the other at panicle-initiation stage). At

Table 1. Influence of coirpith on nutrient uptake by 'ADT 36' rice crop (kg/ha)

Treatment	Main crop					Subsequent crop				
	N	P	K	Ca	Mg	N	P	K	Ca	Mg
T_1, Control	72.5	32.5	100.3	13.5	31.8	68.8	12.9	65.2	7.3	23.7
T_2, RCP	87.1	34.4	112.6	14.8	32.9	86.1	19.9	66.2	8.3	23.4
T_3, 5 days CCP	101.1	44.9	115.8	15.4	36.9	101.1	18.8	65.2	10.0	26.3
T_4, 10 days CCP	119.3	43.8	117.4	15.9	36.4	100.9	18.9	64.7	8.7	23.1
T_5, 15 days CCP	117.2	49.4	118.8	15.6	36.9	117.7	23.6	71.1	9.7	25.2
T_6, 20 days CCP	132.3	52.9	124.5	15.8	38.5	102.0	24.7	71.2	10.4	25.8
T_7, 25 days CCP	160.7	53.2	127.7	16.8	40.5	102.9	26.2	70.6	9.1	24.9
T_8, 30 days CCP	165.5	55.9	129.7	18.3	39.6	118.8	29.1	73.3	10.1	27.4
CD ($P = 0.05$)	58.0	18.2	11.2	1.8	4.9	38.1	10.6	NS	NS	NS

RCP, Raw coirpith; CCP, composted coirpith harvest grain and straw yields were recorded. The plant samples were dried in oven at 65°C and analysed for total N, P and K by the methods of Humphries (1956), Jackson (1973) and Stanford and English (1949) respectively. Ca and Mg were analysed by the versenate titration method (Jackson, 1973). From the nutrient content uptake was calculated and the results were statistically analysed (Panse and Sukhatme, 1967). A subsequent crop of rice (var. 'ADT 36') was raised in the same plots without addition of any fertilizer and manure.

The pattern of nutrient uptake in both the crops is presented in Table 1. The influence of raw coirpith (RCP) as well as composted coirpith (CCP) up to 15 days was similar on the uptake of nitrogen. N uptake at 20–30 days was significantly higher in CCP-applied plots than in RCP-applied and at 5 days in CCP-applied plots. The influence of coirpith application was not observed in the subsequent crop, which might be due to the fact that coirpith applied to the first crop in different stages composting would have well composted during the subsequent crop.

The P uptake at 20–30 days CCP plots were at par but significantly higher than RCP-applied plots. RCP plots were on par with CCP plots 5–5 days. This trend in P uptake was not recorded in the crop subsequently raised in the same plots, possibly due to the reasons mentioned for N uptake.

Coirpith-applied plots recorded significantly higher K uptake (12.3–29.3%) than the control. Ganapathi (1991) reported higher uptake of K when coirpith applied to plots. Among the coirpith-applied plots, RCP did not significantly vary up to 15 days CCP plots. K uptake in 30 days CCP plots was significantly higher than 10 days CCP plots, but on a par with that in plots which received coirpith composted for more than 15 days implying that 15 days composting in sufficient. In the subsequent crop, the treatment variations were non-significant (Table 1). The trend of uptake of Ca and Mg in both the crops was similar to that of K uptake.

The grain of rice crop was the highest in the plots received 30 days CCP and at par with 20 and 25 days CCP (Table 2). They were significantly higher than the control RCP and 5 days CCP. Nagarajan *et al.*

Table 2. Influence of coirpith on yield (tonnes/ha) of 'Adt 36' rice

Treatment	Main crop		Subsequent crop	
	Grain	Straw	Grain	Straw
Control	3.31	6.74	2.86	4.68
RCP	3.43	7.07	3.10	4.70
5 days CCP 12.5 tonnes/ha	3.42	7.24	3.46	4.73
10 days CCP	3.57	7.31	3.56	4.75
15 days CCP	3.68	7.15	3.59	4.90
20 days CCP	3.75	7.37	3.32	4.90
25 days CCP	3.79	7.83	3.52	4.81
30 days CCP	3.82	7.91	3.56	4.72
CD (P = 0.05)	0.07	0.33	NS	NS

RCP, row coirpith; CCP, composted coirpith

(1983) reported higher yield of rice with composted coirpith. The variations due to treatments in the second crop were not significant. The highest straw yield was recorded in 30 days CCP-applied plots, which was significantly higher than the control and on a par with other treatments. In the subsequent crop the straw-yield variations were non-significant.

These results indicated that application of 20 days composted coirpith is as good as 30 days composted coirpith in respect of nutrient uptake as well as yield and 5–15 days composted coirpith is also as good as raw coirpith though better than the control.

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Response of wheat (*Triticum aestivum*) to nitrogen, phosphorus and potassium fertilization

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A field experiment was conducted with wheat (*Triticum aestivum* L. emend. Fiori & Paol.) at the research farm of Pantnagar during the winter season (*rabi*) 1987–88. The soil was silty clay-loam (Vertisols). It was high in organic carbon (0.94%), low in available P (9.7 kg P_2O_5/ha) and potash (135.7 kg K_2O/ha), and slightly alkaline (pH

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