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EFFECT OF COIR PITH AS AN AMENDMENT FOR TANNERY POLLUTED SOILS

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ABSTRACT

The letting in of tannery effluent causes pollution of ground water and degradation of cultivable land. Soil amendments *viz.*, composted coir pith, pressmud, gypsum and farm yard manure were tried for increasing the productivity of polluted land. Application of 10 t/ha of composted coir pith gave increased yield of maize (Co.1) and finger millet (Co.13). The increased yield was due to improved physical condition and keeping the soil moist preventing capillary rise of salts to the surface.

Tannery pollution has rendered valuable agricultural land unproductive, besides causing serious damage to the quality of ground water. Nearly 75 per cent of tanneries in Tamil Nadu are located in North-Arcot-Ambedkar District. In the entire stretch of Palar basin over a length of 100 km from Vaniyambadi to Walajahpet, different grades of tannery pollution of soil and ground water are observed. The productivity over an area of 35,000 hectares has been badly affected by these tanneries either by direct or indirect pollution. The continuous use of polluted ground water with high electrical conductivity ranging from 5.0 to 15.0 dsm^{-1} resulted in accumulation of sodium, chloride, sulphate, sulphide and chromium ions in the soil, affecting crop growth.

MATERIALS AND METHODS

A field experiment (during *kharif* 1989) with the soil amendments *viz.*, coir pith, press mud, gypsum and farm yard manure at 10 t/ha with an absolute control was conducted at Ambur in North Arcot Ambedkhar district of Tamil Nadu to study their effect on Co 1 maize in the tannery effluent affected soil. The EC of irrigation water and the soil was 7.0 and 1.0 dsm^{-1} and the pH was 7.4 and 8.3 respectively. The same experiment was repeated during *rabi* 1989 with Co 13 fingermillet crop.

A third field experiment was conducted with maize Co 1 during *kharif* 1990 at Pernampet and Vaniyambadi in North Arcot-Ambedkhar direct to compare the effect of composted coir pith over raw coir pith as amendment in the tannery effluent affected soil. Besides composted coir pith and raw coir pity, three other soil amendments *viz.*, pressmud, gypsum and farm yard manure at the rate of 10 t/ha were tried. The coir pith was composted using *Pleurotus sojar-caju* as per the method suggested by Nagarajan *et al.*, (1985). EC and pH of irrigation water and soil at Vaniyambadi and Pernampet were 5.4 and 0.5 dsm^{-1} and 7.3 and 8.2; 5.9 and 0.5 dsm^{-1} and 7.1 and 7.8 respectively.

RESULTS AND DISCUSSION

The results of experiments (Table 1) showed that the application of coir pith at 10 t/ha increased the grain yield of both maize and fingermillet, the increase being 289 kg in Co 1 maize and 386 kg in Co 13 finger millet over control. The increased grain yield was due to the improvement in the physical condition of soil with the application of coir pith. The coir pith improved the drainage besides keeping the soil moist preventing capillary rise of salts and thus the accumulation of salts around root zone of the crop was avoided. Nagarajan *et al.* (1986, 1987) also observed increased yield of groundnut and rice with the use of coir pith.

Table 1. Effect of soil amendments on yield of maize and finger millet at Ambur

Treatment	Co 1 Maize		C0 13 Fingermillet	
	Mean yield (kg/ha)		Mean yield (kg/ha)	
	GRAIN	STRAW	GRAIN	STRAW
T1 composted coir pith	2914	6350	2368	5270
T2 Pressmud	2810	6152	2228	5040
T3 Farm yard manure	2726	6053	2185	4930
T4 Gypsum	2705	6137	2150	4925
T5 Control	2625	5807	1982	4680
C.D. (0.05)	60.0	136.0	68.0	

Table 2. Effect of soil amendments on yield of maize

Treatment	Pernampet		Vaniambadi	
	Mean yield (kg/ha)		Mean yield (kg/ha)	
	GRAIN	STRAW	GRAIN	STRAW
T1 composted coir pith	3580	7190	2615	5825
T2 Cor pith (raw)	3493	7188	2596	5525
T3 Pressmud	3411	7173	2477	5400
T4 Farm yard manure	3359	7100	2431	5350
T5 Gypsum	3264	6863	2349	5375
T6 Control	3065	6175	2125	5025
C.D. (0.05)	91.6	361.4	111.9	317.4

The results of the third experiment revealed (Table 2) that there was no difference between the raw and the composted coir pith with respect to grain yields. These two treatments were superior to the rest of the amendments tried. Similar results in sugarcane were also reported by Devaraj (1991) using raw coir pith for increasing the yield of sugarcane in tannery polluted areas of North Arcot Ambedhkar district. The results had conclusively proved either the raw or composted coir pith can be used as soil amendment at 10 t/ha for increasing the productivity of maize and fingermillet in tannery effluent polluted soils.

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INFLUENCE OF NITRIFICATION INHIBITORS ON NUTRIENT AVAILABILITY, YIELD AND UPTAKE IN RICE SOILS.

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ABSTRACT

A field experiment was conducted in sandy clay loam soil to study the effect of nitrification inhibitors on nutrient availability, yield and uptake of nutrients by rice. The available nitrogen (N), phosphorous (P) and potassium (K) contents were higher in treatments with 75 per cent N as nitrification inhibitors and the rest as prilled urea (PU). The nimin coated urea (NICU) treatments showed higher grain and straw yields than neem cake coated urea (NCU) and PU treatments. Nitrification inhibitors applied treatments recorded higher N, P and K uptake than untreated urea treatment.

The low recovery rate of nitrogenous fertilizers under lowland rice cultivation is due to the system of flooding and drying of soils. Nitrogen, being the most mobile element is lost through leaching, volatilization and denitrification. One of the low cost technologies is to go in for coating urea with indigenous materials like neem products which retard nitrification and thereby make nitrogen available to the crop in a steady state for relatively longer period. Therefore, the influence of NICU and NCU on increasing the efficiency of applied N in rice soils was studied.

MATERIALS AND METHODS

The study was conducted during *kharif* season in sandy clay loam soil (Typic Haplustalf) with ADT 36 rice. The soil was neutral in reaction having 121.8, 6.1 and 165.0 ppm of available N, P and K respectively and 0.54 per cent of organic carbon.

Nitrogen at recommended level (100 kg N ha^{-1}) was applied in 3 splits, half at basal, 25 per cent at tillering and 25 per cent at panicle initiation stage. The treatment structure is given in Table 1. The nitrification inhibitors with and without PU