

## Effect of Press Mud Application on Nutrient Uptake by Ragi

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A Neubauer study was carried out with four soils incubated with press mud at 0, 5 and 10 t/ha for 60 days. Ragi (CO 10) seedlings were raised for a period of 17 days. The germination per cent, mean root and shoot length, dry matter yield and uptake of nutrients were studied. Press mud application significantly reduced the germination of ragi seeds, but the growth of seedlings was better in the treated soil than in control. The uptake of N, P and K was not influenced by the treatments, but press mud application at 5 t/ha increased Ca uptake over control.

Press mud is a by-product of the sugar industry and this material is rich in organic matter and Ca, besides containing considerable quantities of plant nutrients like N, P, and micro nutrients. Therefore press mud has been used as a soil conditioner, soil ameliorant and nutrient source for crops. Laboratory incubation studies carried out with five soils amended with press mud had shown that press mud application favourably influenced physical, chemical and biological properties of soils. This study was carried out to determine the nutrient uptake in soils amended with press mud as shown by Neubauer seedling technique.

### MATERIAL AND METHODS

Four soils of varying soil properties viz., acid soil from Kanyakumari, red soil from Dasarpathi (Coimbatore District) and black gardenland and

wetland soils from Coimbatore were used in the study. Press mud obtained from Sakthi Sugars, Appakudal, near Erode was used for the study. The soils mended with press mud at 0, 5 and 10 t/ha replicated 3 times and incubated for 60 days were used for the Neubauer study (Tisdale and Nelson, 1956). A quantity of 100 g of the incubated soils was thoroughly mixed with 50 g of acid washed sand in uniform cylindrical dishes, 100 seeds of ragi (CO 10) were sown in each dish and moistened with water. Germination counts were taken from the third day onwards. After 17 days the seedlings were removed and their root and shoot lengths were measured. The seedlings were washed, dried in oven and the dry matter yields recorded. The samples were analysed for N, P, K and Ca contents and the uptake of these nutrients was calculated. The vigour index

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TABLE I Influence of Press mud Application on Germination, Growth and Yield of Neubauer Seedlings  
(Mean of 3 replications)

Particulars	Treatment	Red Soil	Black (wet-land) Soil	Black (Garden-land) Soil	Acid Soil
Germination (%)	T <sub>1</sub>	100	100	84	82
	T <sub>2</sub>	100	98	77	82
	T <sub>3</sub>	97	93	66	80
Shoot Length (cm)	T <sub>1</sub>	3.43	3.80	3.53	3.57
	T <sub>2</sub>	3.70	3.60	3.77	3.30
	T <sub>3</sub>	3.83	3.97	3.83	3.67
Root length (cm)	T <sub>1</sub>	8.13	8.90	8.80	9.46
	T <sub>2</sub>	9.57	8.57	8.50	8.73
	T <sub>3</sub>	9.67	7.57	8.77	8.67
Vigour Index (cm)	T <sub>1</sub>	1156	1270	1036	1068
	T <sub>2</sub>	1327	1193	945	986
	T <sub>3</sub>	1310	1073	832	987
Drymatter yield (mg/dish)	T <sub>1</sub>	219	184	200	243
	T <sub>2</sub>	192	147	159	195
	T <sub>3</sub>	183	158	149	181

Levels of press mud (t/ha)  
 T<sub>1</sub> — 0  
 T<sub>2</sub> — 5  
 T<sub>3</sub> — 10

was calculated using the formula, Vigour index = (Root length + Shoot length) X germination percentage (Abdul — Baki and Anderson, 1973).

## RESULTS AND DISCUSSION

The germination of ragi seeds (Table I) was influenced by the treatments. Application of press mud at 10 t/ha significantly reduced germination

compared to application at 0 and 5 t/ha. This may be due to the higher quantity of organic matter applied through press mud. Sen and Basu (1940) observed that yields of peas and wheat, used as indicator plants, decreased with increasing level of filter cake application.

The mean shoot length of seedlings was increased by application of 10t press mud compared to 5 and 0t/ha.

TABLE II Influence of Press mud Application on the Uptake of Nutrients By Neusauer Seedlings

Particulars	Treatment	Red Soil	Black (wet-land) Soil	(Black Garden-land) Soil	Acid Soil
Nitrogen uptake (N) mg/dish	T <sub>1</sub>	2.33	3.93	4.90	5.35
	T <sub>2</sub>	3.46	3.60	3.50	4.83
	T <sub>3</sub>	3.91	3.98	4.51	3.50
Phosphorus uptake (P) mg/dish	T <sub>1</sub>	1.40	0.76	1.09	1.21
	T <sub>2</sub>	1.42	0.85	1.16	1.04
	T <sub>3</sub>	1.62	0.97	1.07	1.16
Potassium uptake (K) mg/dish	T <sub>1</sub>	4.7	4.5	4.3	5.7
	T <sub>2</sub>	4.1	3.4	4.1	4.5
	T <sub>3</sub>	4.8	3.5	3.6	5.1
Calcium uptake (Ca) mg/dish	T <sub>1</sub>	8.0	10.2	19.0	25.9
	T <sub>2</sub>	19.4	14.4	28.1	19.3
	T <sub>3</sub>	13.1	12.1	21.0	20.5

This shows that the growth of the seedling was increased in the press mud treated soil, probably due to improved soil physical condition. The mean root length of the seedlings was also higher in the press mud treated soils. Paul (1974) reported that filter press cake improved the root system of sugarcane.

The vigour index was higher in the press mud treatments compared to control in the red soil. Press mud application resulted in a lower dry matter yield than control, probably due to reduction in germination in these treatments.

The soils differed significantly in the uptake of N and P, while there was no difference in the case of K uptake (Table II). Press mud application did not affect the uptake of N, P and K.

The uptake of Ca was significantly influenced by soils as well as treatments. Application of press mud 5 t/ha increased the Ca uptake compared to control and higher level of press mud, application.

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