

Effect of pressmud and rice husk on growth and yield of main and ratoon crops of sugarcane (*Saccharum officinarum*)

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ABSTRACT

An experiment was conducted during 1991 and 1992 to study the effect of pressmud and rice husk on the growth and yield of main and ratoon crops of sugarcane (*Saccharum officinarum* L.) Increase in fertilizer dose from 250, 75 and 75 to 375, 112.5 and 112.5 kg N, P and K/ha respectively did not increase the cane yield of main and ratoon crops. Incorporation of pressmud in combination with chemical fertilizers did not increase the seed yield of main crop, but its effect was seen on the succeeding ratoon crop. Cane yield with ratoon crop with application of 125% NPK (312.5, 93.7, 93.7 kg N, P and K/ha) through fertilizer + 25% NPK through rice husk was at par with 150% (375, 112.5 and 112.5 kg N, P and K/ha) through fertilizer, thus indicating the saving of chemical fertilizer by 25% in ratoon crop.

Rice and sugarcane (*Saccharum officinarum* L.) are the main crops in Tungbhadra command area of Karnataka. In recent years, yields in this area has been reduced below the state average of 77.2 tonnes/ha. This may be attributed to the poor fertilizer management. Rabindra *et al.* (1990) reported that continuous application of farmyard manure (FYM) along with NPK fertilizer improves physico-chemical properties of soil, cane yield and juice quality. The main present-day problem is the availability of required quantity of FYM. In this command area rice and sugarcane are mainly grown and therefore, rice husk and pressmud are available in abundant. Hence the present experiment was laid out to study the effect of pressmud and rice husk on the growth and yield of main and ratoon crops of sugarcane.

MATERIALS AND METHODS

The experiment was conducted during 1991 and 1992 at Agricultural Research Sta-

tion, Siruguppa. The soil type was deep black (Vertisols) with pH 8.0. The soil had 318 kg N/ha, 47 kg P₂O₅/ha and 446 K₂O kg/ha. Eleven treatments comprising levels of NPK in combination with pressmud and rice husk (Table 1) were replicated thrice in randomized block design. Based on the nitrogen content of pressmud (2% N) and rice husk (0.5%) chemical fertilizer was substituted. Full dose of P₂O₅ and K₂O was applied basal for both main and ratoon crops. For main crop, N was applied in 4 splits, i.e. 10% at planting (1 February 1991), 20% on 15 March 1991, 30% on 23 April 1991 and 40% on 3 May 1991, while for ratoon crop N was applied twice, viz. 30% on 25 March 1992 (1 month after stubble shaving) remaining on 28 April 1992. Pressmud (3.1 tonnes/ha) and rice husk (12.5 tonnes/ha) were applied on 31 January 1991, mixed in soil and planting was done on 1 February 1991. For ratoon crop, rice husk and pressmud were given after stubble shaving (12

February 1992). The gross plot and net plot sizes were 7.5 m x 5.0 m and 4.5 m x 4.0 m respectively. Sugarcane variety 'CoC 671' was planted giving 75 cm spacing between rows. Main crop was harvested on 31 January 1992 and ratoon crop on 18 February 1993. At the time of harvesting, growth (plant height, girth and internodes/cane), yield and yield attributes (millable canes/ha and weight/cane) were recorded and analysed statistically.

RESULTS AND DISCUSSION

Main crop

Increase in the fertilizer level from 100% to 150% did not increase the cane yield significantly. Similarly, the growth and yield attributes were not influenced

significantly by fertilizer levels. Singh *et al.* (1990) obtained increase in cane yield up to 160, 80 and 60 kg N, P and K ha.

Reduction of chemical fertilizers and substitution with pressmud or rice husk also had no significant effect on cane yield and attributes. It indicates that it was possible to reduce the chemical fertilizer levels with supplementation of pressmud or rice husk (Tables 1, 2).

Ratoon crop

In ratoon crop also an increase in fertilizer dose from 100 to 150% did not increase the cane yield significantly. However, pressmud or rice-husk incorporation showed beneficial effect on cane yield. The effect was more pronounced with rice husk than with

Table 1. Cane height, girth and number of internodes/cane as influenced by different treatments

Treatment	Main crop			Ratoon crop		
	Cane height (cm)	Girth (cm)	Internodes/cane	Cane height (cm)	Girth (cm)	Internodes/cane
RDF (250, 75, 75 kg/ha of N, P, K)	303	7.2	25.5	171	8.3	12.4
125% (312.5, 93.7, 93.7 kg/ha of N, P, K)	305	8.0	23.8	183	8.3	15.0
150% (375, 112.5, 112.5 kg/ha of N, P, K)	305	8.1	23.5	183	8.6	17.2
75% RDF + 25% of fertilizer through pressmud	223	7.7	24.7	170	8.3	12.8
100% RDF + 25% of fertilizer through pressmud	293	8.6	23.0	162	8.4	14.2
125% RDF + 25% of fertilizer through pressmud	297	8.1	21.9	182	8.5	14.4
150% RDF + 25% of fertilizer through pressmud	335	9.3	25.8	171	8.3	14.6
75% of RDF + 25% of fertilizer through rice husk	317	7.7	25.1	167	8.3	13.4
100% of RDF + 25% of fertilizer through rice husk	328	8.5	25.2	180	8.3	15.0
125% of RDF + 25% of fertilizer through rice husk	334	7.7	25.0	189	8.6	15.5
150% of RDF + 25% of fertilizer through rice husk	356	9.5	25.1	185	8.6	16.8
CD (P = 0.05)	NS	NS	NS	14	NS	2.1

RDF, Recommended dose of fertilizer (100%); NS, non-significant

Table 2. Cane yield and yield attributes as influenced by different treatments

Treatment	Main crop (1991-92)			Ratoon crop (1992-93)		
	Cane yield (tonnes/ha)	Millable canes/ha ('000/ha)	Weight/cane (kg)	Cane yield (tonnes/ha)	Millable canes/ha ('000/ha)	Weight/cane (kg)
RDF (250, 75, 75 kg/ha of N, P, K)	140	11.55	1.23	59.3	13.18	0.47
125% (312.5, 93.7, 93.7 kg/ha of N, P, K)	134	11.61	1.16	58.3	12.17	0.53
150% (375, 112.5, 112.5 kg/ha of N, P, K)	140	13.17	1.06	67.9	13.26	0.50
75% RDF + 25% of fertilizer through pressmud	137	11.28	1.20	66.7	12.32	0.58
100% RDF + 25% of fertilizer through pressmud	143	12.33	1.17	63.9	11.37	0.59
125% RDF + 25% of fertilizer through pressmud	136	12.61	1.07	68.3	12.04	0.57
150% RDF + 25% of fertilizer through pressmud	153	13.72	1.13	76.1	13.28	0.60
75% of RDF + 25% of fertilizer through rice husk	130	11.89	1.09	75.4	13.54	0.62
100% of RDF + 25% of fertilizer through rice husk	127	12.67	1.02	80.4	12.74	0.71
125% of RDF + 25% of fertilizer through rice husk	141	13.17	1.08	75.4	12.63	0.66
150% of RDF + 25% of fertilizer through rice husk	159	13.56	1.20	80.7	11.91	0.78
CD (P = 0.05)	NS	NS	NS	10.9	NS	0.10

RDF, Recommended dose of fertilizer (100%); NS, non-significant

pressmud. Application of 150% fertilizer in combination with rice husk recorded the highest cane yield of 80.7 tonnes/ha.

Application of 125% NPK through fertilizer + 25% NPK through rice husk recorded at par cane yield with that of 150% NPK through fertilizer, showing the efficiency of rice husk in substituting the chemical fertilizer by 25%. Weight/cane followed similar trend. Millable canes/ha were not found sig-

nificantly affected.

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