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Lime for Paddy in Coorg

by

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Rice is one of the most acid tolerant crops. Yet Mitsui (2) mentions that for a long time Japanese farmers have been laying great emphasis on the application of lime to paddy fields. He found that addition of lime remarkably increased nitrogen mineralisation and that 1100 kg. per hectare of slaked lime corresponds to the application of as much as 350 kg. of soybean cake per hectare. Govindarajan and Narayanan (1) report on the beneficial effect of liming for paddy. It was therefore thought worthwhile to try application of lime on acid soils in Coorg. The environmental and soil conditions here have been described by Subramaniam (4). Simple experiments in cultivators' fields were laid out on the broad lines described by Panse and Sukhatme (3) to find the crop's response to lime.

During the 1954–55 season a simple manurial experiment with 37 replications on randomly selected fields all over Coorg was laid out. In each field three plots of 10 cents were marked out and given the following three treatments:

(a) Control i. e., cultivators' practice

(b) 30 lb. N as ammonium sulphate, 30 lb. P_2O_5 as Superphosphate.

30 lb. K_2O as Muriate of potash per acre.

(c) 30 lb. N, 30 lb. P_2O_5, 30 lb. K_2O plus 5 cwt. lime per acre.

The treatments were superimposed on what the cultivator would normally do i. e., six rounds of ploughing, two of which in the dry stage, incorporation of 2 tons of farmyard manure and 2000 lb. green leaves per are, transplanting of a month old seedlings of "Kiribilia" 9"–12" apart in July–August and one weeding during the growth period. The treatments were randomised for each field. One and quarter cent plots were marked out randomly in each treatment plot and harvested in December–January. The grain yield is presented in table I.

TABLE I

Results of manurial experiment 1954—55 season. Mean yield of paddy in pounds per plots of 1/80 acre.

Zone	Number of replications	Rainfall inches annual	Treatment a	b	c	F Value treatment	C. D.
Somwarpet	9	71–100	39·7	51·2	56·0	15·2	8·77 c b a
Fraserpet	4	40–70	46·2	52·5	52 2	not significant	
Ponnampet	8	71–100	49·4	49·5	58·4	9·1	7·15 c b a
Virajpet	7	above 100	40·1	44·6	50·0	not significant	
Mercara	4	do	48·5	64·0	65·8	do	
Nopoklu	5	do	39·8	46·8	47·2	do.	
District	37	do	43·5	50·5	54·5	25·9	7·15 c b a

While there was significant response in yield to application of lime in two zones lying in the 71–100″ rainfall belt, in all other zones the paddy crop in the lime applied plots was much greener in appearance and flowered earlier and had more percentage of well filled grains, than in the other two plots.

During the 1955–56 season another type of experiment on similar lines was laid to find out the effect of lime alone with the following four treatments:

(a) Control or cultivators' practice same as last year
(b) 5 cwt. lime per acre
(c) 10 cwt. lime per acre
(d) 15 cwt. lime per acre

There were 36 replications and in each replication four ten cents plots were treated. As before 1/80 acre plots were randomly harvested in the treatment plots and the yield data is given in table II.

TABLE II

Results of manurial experiment 1955—'56 season mean yield of paddy in pounds per plot of 1/80 acre.

Zone	Number of replications	rainfall inches annual	treatments a	b	c	d	F value treatment	C. D.
Eastern	11	40–70	55·4	58·3	64·1	62·6	2·2	not significant
Central	12	71–100	44·1	48 0	50·3	53·6	10·91	4·62 d c b a
Western	13	above 100	38·6	40·8	42·1	42·3	1·45	not significant
District	36		45·6	48·5	51·5	52·3	7·2	3 78 d c b a

In the second year also there has been significant response to lime in the 71–100″ rainfall zone. There has also been progressive increase in yield for higher doses of lime.

It is probable that this phenomenon of response only in the 71–100″ rainfall zone may be due to either the soil type or due to rainfall intensity in that zone. Rice in Coorg is a purely rainfed crop grown between July and December. The monthly mean rainfall for six representative places is given in table III.

TABLE III

Mean rainfall (inches) based on data for 50 years.

Places	January	February	March	April	May	June
Mercara ..	·16	·24	·76	2·56	5·21	25·50
Virajpet ..	·13	·26	·70	2·84	5·63	24·47
Frazerpet ..	·16	·26	·43	2 65	5·21	6·36
Somwarpet ..	·18	·15	·48	2.52	4·40	13·96
Ammathi ..	·19	·18	·85	3·03	5·45	16·70
Napoklu ..	·36	·38	1·77	5·48	6·38	24·21

Places	July	August	September	October	November	December	Annual
Mercara ..	43·11	26·80	11·08	8·29	3 00	0·72	127·43
Virajpet ..	34·38	17·29	7·73	8·46	3·36	·57	105·82
Frazerpet ..	9·27	5·23	3·38	6·37	2·85	0·58	42·75
Somwarpet ..	29·81	17·28	6·40	6·76	3·35	0·66	85·95
Ammathi ..	26·29	15·84	6·26	8·17	3·53	·52	87.01
Napoklu ..	40·85	21·89	7·85	9·21	3·58	0·64	122·60

An attempt was made to correlate yield with rainfall in the control plots of this and other manurial experiments in cultivators' field in this district in 1955–56 season. The mean yields in control plots are given in table IV.

TABLE IV

Yield and Rainfall

Annual rainfall inches	Number of plots harvested	Mean yield in pounds per 1/80 acre plot
41–50	21	52
51–60	21	40
61–70	34	43
71–80	14	47
81–90	21	48
91–100	42	45
101–110	21	40
110–120	7	41
121–130	19	42
131–above	14	39

There is progressive increase in yield with increase of rainfall upto 90″ and with further increases in rainfall there is a steady decrease in yield. Strangely the mean yield for the 40–50″ rainfall zone is the highest. There would also appear to be some reason to believe that the 70–100″ rainfall zone has the optimum conditions for maximum growth and response to applications of lime. How much effect the property of soil in this zone has on yield needs investigation. However it is clear that profitable returns can be had from application of lime to rice soils in Coorg.

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