

## STUDIES ON THE INFLUENCE OF LIMING ON THE GROWTH AND YIELD OF RICE IN AN ACID PEAT SOIL (KARI SOIL) OF KERALA

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The concept that rice which is some what tolerant of acidity does not require any liming has undergone a radical change in view of the recent findings of the rice scientists that liming the rice soils is absolutely essential when the pH is lower than 5.5. (Borasio 1952, Mitsui 1954, Cordoba 1954, Deguchi *et al* 1955, Digar 1956, Angladette 1960, Chang *et al* 1960). The lime requirement of the *kari* soils of Kerala was reported to be as high as 40 tons of calcium carbonate per hectare (Subramoney and Sankaranarayanan 1963). Precise information on the response of rice to liming in the *kari* soils is not available. The present investigations were therefore undertaken to study the effect of dolomite and burnt lime applied to the *kari* soils at different levels on the performance of rice grown in them.

### Materials and Methods

A field experiment in a simple randomized block design with three replications was conducted at Mundar (Kottayam District of Kerala), a typical Kari soil region during 1964-65 using PTB 10-variety of rice. The treatments included the two liming materials, viz burnt lime and dolomite applied at the levels of 0.7, 1.4 and 2.8; 1.2, 2.4 and 4.8 tons per hectare respectively, which correspond to 1/20, 1/10, and 1/5 of the actual lime requirement of the soil under experiment. Each was applied as a single dose fifteen days before sowing; as a single dose fifteen days after sowing and as two equal split doses one before and the other after sowing. Cultivation practices were uniform in all the plots. Productive and yield factors like height of plants, number of tillers (at flowering stage) and weight of straw and grain were recorded. The data were statistically analysed.

### Results and Discussion

From Table I it is apparent that liming did not appreciably influence the height of plants. Tiller number was significantly increased by both the lime materials at all the levels of application. On an average, the application of lime-materials increased

Table 1

Productive and Yield Factors of rice as influenced by Liming  
at different levels and time of application

Dosage* (Tons/ha)	Time of application: single or split before or after sowing.	Height of Plant cm	Tiller Number	Weight of straw Kg/ha.	Weight of grain Kg/ha.
<i>Burnt lime</i>					
4.8	Single, before	95.5	7.0	2468	2016
„	Single, after	84.5	6.3	1570	1482
„	Split, before and after	95.5	10.0	1778	1662
1.4	Single, before	88.0	6.6	1660	1403
„	Single, after	89.6	7.3	1570	1440
0.7	Split, before and after	91.4	7.6	1385	1337
„	Single, before	88.0	6.0	1353	1235
„	Single, after	94.7	8.6	1375	1359
„	Split, before and after	92.2	6.6	1328	1212
<i>Dolomite.</i>					
4.8	Single, before	91.0	8.6	1835	1853
„	Single, after	92.2	9.1	1610	1564
„	Split, before and after,	93.9	6.3	1678	1502
2.4	Single, before	86.3	7.6	1353	1359
„	Single, after	94.7	7.1	1578	1482
„	Split, before & after	91.0	8.0	1353	1212
1.2	Single, before	88.9	7.3	1320	1275
„	Single, after	86.3	8.0	1378	1440
„	Split, before and after	87.1	7.0	1338	1145
No lime (Control)		84.5	5.9	1328	965
C.D.		Not sig.	0.5	197	138

\*The doses of lime materials correspond to 1/5, 1/10 and 1/20 of the lime requirement of the soil.

the tiller number by about 32 per cent. In general, the higher doses of the lime materials considerably increased the straw yield. The doses of the lime materials viz. 2.8 and 4.8 tons per hectare of burnt lime and dolomite respectively, corresponding to 1/5 of the lime requirement of the soil, increased the straw yield by about 37 per cent. The lower doses viz. 0.7 and 1.2 tons per hectare of burnt lime and dolomite respectively which correspond to 1/20 of the lime requirement was not much effective in increasing the straw yield. It appeared that burnt lime was more effective than dolomite in its effect on straw yield. No significant difference was observed between the lime application before and after sowing and between the single and the split applications. There was a significant difference in the grain yield due to the different levels of the lime application. The higher doses viz. 2.8 and 4.8 tons per hectare of burnt lime and dolomite respectively, which correspond to 1/5 of the lime requirement of the soil, gave significantly higher yields than the lower doses of both lime materials. The average increase in the grain yield was in the order 709, 404, and 312 Kg, per hectare due to the liming at levels 2.8, 1.4 and 0.7 tons per hectare of burnt lime and 4.8, 2.4 and 1.2 tons per hectare of dolomite, which are equivalent to 1/5, 1/10, and 1/20 of the actual lime requirement of the soil. While the increases in the grain yield due to the doses of 2.8, 1.4 and 0.7 tons per hectare of burnt lime were 743, 428, and 303 Kg per hectare, the corresponding increases due to dolomite at the doses of 4.8, 2.4 and 1.2 tons per hectare were 674, 386 and 321 Kg per hectare. Statistically, burnt lime and dolomite were equally significant in increasing the grain yield. So also, it was found that there was no consistent difference between the lime application before and after sowing. The single application of the lime materials before the sowing gave significantly higher grain yield than the split application.

### Summary

A field experiment was conducted during 1964-65 with a view to assessing the influence of burnt lime and dolomite applied at low levels viz. 0.7, 1.4, and 2.8; 1.2, 2.4 and 4.8 tons per hectare respectively, which correspond to 1/20, 1/10 and 1/5 of the actual lime requirement of the soil, on the growth and yield of rice in the *Kari* soils of Kerala. Liming both before and after the sowing were equally effective with respect to the growth and yield of rice. The single and split applications of lime materials were almost similar in their influence on the tiller production and the straw yield. But with respect to grain yield the single application before sowing was more effective than the split application. Burnt lime and dolomite were almost equal in their effect on the grain yield. The application of lime materials at the level of

2.8 and 4.8 tons of burnt lime and dolomite respectively which correspond to 1/5 of the lime requirement of the soil brought about 73 per cent increase in the grain yield. Levels lower than this were also effective in substantially enhancing the rice yield in *Kari* soils.

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