

## LIMING IN KARAPPADAM SOIL OF KUTTANAD

Kuttanad, the rice bowl of Kerala, comprises of the *karappadam*, *kayal* and *kari* lands. The *karappadam* soil is moderately acidic, whereas that of *kayal* land is neutral to slightly acidic and *kari* soil is highly acidic. In all these soils, whenever the paddy fields become dry, the hydrogen ion concentration on the surface soil increases, causing dissolution of iron and aluminium compounds. The temporary phase may not affect immediately the standing crop, but ill effects caused to the soils will have to be corrected. The commissioning of Thanneermukkom bund in Kuttanad, has altered the ecological conditions, physical, as well as chemical properties of the soils of the region. Under the above circumstances, it became necessary to conduct some studies on the amelioration of acid soils.

Three experiments were conducted for three seasons viz., punja 1982-83 and 1983-84 and the additional crop season 1983 in the Rice Research Station, Moncompu in separate replicated trials using the variety Pavizham in plots of size 5 x 4m<sup>2</sup> with a spacing of 20 cm x 10 cm. The soil was clayey loam and pH of the wet soil was 6.5 and that of the dried soil was 5 to 5.5. The treatments were:

### a) *Time of application of lime*

- 1) No lime (control)
- 2) 725 kg of lime, seven days prior to planting
- 3) 725 kg of lime, two days prior to planting
- 4) 325 kg of lime, seven days prior to planting, 200 kg of lime two days prior to planting and 200 kg two weeks after planting
- 5) 500 kg of lime, 2 days prior to planting and 225 kg of lime, 2 weeks after planting

### b) *Different levels of lime*

- 1) No lime (control)
- 2) Application of 250 kg of lime, 2 days prior to planting
- 3) Application of 500 kg of lime, two days prior to planting
- 4) Application of 750 kg of lime, two days prior to planting

### c) *Different forms of lime*

- 1) No lime (control)
- 2) Application of lime  $\text{Ca}(\text{OH})_2$ , 725 kg per ha
- 3) Application of quick lime (CaO), 725 kg per ha
- 4) Application of dolomite ( $\text{CaCO}_3$   $\text{MgCO}_3$ ), 925 kg per ha
- 5) Application of lime ( $\text{CaCO}_3$ ), 1000 kg per ha

The results showed that different forms of lime, different levels of lime, or its time of application did not appreciably influence the production of tillers and height of plants in both the vegetative and productive stages of the crop.

Table 1  
Effect of lime on growth and yield of rice (means of three seasons)

Treatments		Height of plant (cm)	No. of vegetative tillers	Height of productive tillers (cm)	No. of productive tillers	Grain yield kg/ha	Straw yield kg/ha
<i>Time of application of lime</i>	T <sub>1</sub>	45.45	12.69	86.75	6.98	3099	5391
	T <sub>2</sub>	51.88	12.18	86.14	6.86	2855	5644
	T <sub>3</sub>	52.59	2.07	85.53	7.40	2758	5856
	T <sub>4</sub>	52.90	11.68	86.12	6.99	3032	5224
	T <sub>5</sub>	50.42	10.99	84.76	6.82	3034	5123
<i>Levels of lime</i>	C. D.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.
	T <sub>1</sub>	55.99	10.95	84.56	7.11	3264	4989
	T <sub>2</sub>	55.73	11.07	84.83	6.84	3333	4967
	T <sub>3</sub>	52.60	10.78	83.47	6.53	3526	4889
	T <sub>4</sub>	52.62	11.12	83.64	7.02	3398	4909
<i>Forms of lime</i>	C. D.	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.
	T <sub>1</sub>	58.25	11.63	86.34	5.71	3186	4836
	T <sub>2</sub>	55.48	11.46	83.67	6.08	3201	4833
	T <sub>3</sub>	55.46	11.79	84.30	6.26	3151	4853
	T <sub>4</sub>	56.46	11.30	86.38	6.41	3205	5246
	T <sub>5</sub>	56.01	11.06	83.90	6.10	2343	4978
	CD (0.05)	N. S.	N. S.	N. S.	N. S.	N. S.	N. S.

With regard to yield of grain, application of dolomite 925 kg/ha or 725 kg/ha of lime produced an yield of 3205 kg/ha and 3201 kg/ha respectively. When different levels of lime were tried, application of 500 kg of lime, two days prior to planting gave the maximum yield of 3526 kg/ha. The time of application of lime showed no significant response to grain yield.

Dolomite application 925 kg/ha recorded the maximum straw production. Different levels of lime showed no influence on straw production. Application of lime at the 725 kg/ha two days prior to planting recorded the maximum straw yield.

The three experiments showed that lime application influenced both grain and straw production in paddy, but not to the extent of statistical significance. All the treatments received the full quota of inorganic nitrogen also (90 kg/ha) and hence the nitrogen produced as a result of mineralisation under the influence of lime could not play its role for increasing production of grain and straw. This aspect needs detailed investigations.