

Potash Status of Soils of Kerala State

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INTRODUCTION

POTASSIUM HAS LONG BEEN RECOGNISED¹ as one of the major nutrients essential for the normal development of plants. Though no one questions the vital role of potash in the nutrition of crops, unlike nitrogen and phosphorus very little attention has been paid in India so far to this indispensable nutrient. This has been largely due to the general belief that Indian soils are well supplied with potash. In recent years attention has been drawn by several authorities to the serious potash problem facing India. Nair (4) who reduced the potash policy of India to what he called an "Efficiency Index" came to the conclusion that our potash policy is only 1/560 times as efficient as the United States' policy with respect to present crop production and the long term conservation of our soil for our future generations.

In Kerala, woodash has been used for crops like coconut and tapioca from very early times obviously because these crops responded well to the application of this material. But the emphasis, as in other States, has all along been on nitrogen and recently on phosphorus too, while potash has been almost forgotten. It is only within the last few years that the potash problem of Kerala soils has received any serious consideration.

Potash status of soils

Fertility surveys undertaken during the last 20 years of important agricultural tracts in Kerala have thrown considerable light on the nutrient status of the soils in the State. The results of these surveys have been confirmed by soil tests on about 12,000 samples collected from all over the State. The data relating to potash are summarised in Table I and II * * given below.

TABLE I.
Potash status of Wetland (Paddy) soils.

District	No. of samples analysed	Available Potash		
		% of samples falling under		
		Low	Medium	High
Trivandrum	1847	93.6	5.9	0.5
Quilon	815	88.3	10.7	1.0
Kottayam	903	76.7	15.6	7.7
Alleppey	1351	78.7	16.4	4.9
Ernakulam	390	88.5	8.0	3.5
Trichur	585	93.2	6.2	0.6
Palghat	1000	89.0	9.9	0.1
Kozhikode	1083	95.6	4.3	0.1
Cannanore	687	87.6	11.6	0.8
STATE	8661	88.0	9.8	2.2

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* * Data supplied by Soil Testing Laboratory, Vellayani.

TABLE II.

Potash status of Dryland soils.

District	No. of samples analysed	% of Available Potash falling under		
		Low	Medium	High
Trivandrum	428	93.7	5.1	1.2
Quilon	251	96.0	3.2	0.8
Kottayam	536	90.9	8.2	0.9
Alleppey	369	93.2	3.8	3.0
Ernakulam	179	98.3	1.1	0.6
Trichur	304	95.4	4.0	0.6
Palghat	159	84.3	15.1	0.6
Kozhikode	327	96.3	3.1	0.6
Cannanore	271	88.2	11.8	nil
STATE	2824	93.0	6.0	1.0

The data reveal two important points, viz., (i) that there is a widespread deficiency in potash in Kerala, and (ii) that deficiency is very serious all over the State. The figures show that 88% of the wetland soils and 93% of the dryland soils are rated as in available potash. This clearly indicates the magnitude and seriousness of the potash problem in Kerala. The deficiency in potash is particularly marked in laterite soils and the coastal sandy tracts. Even in Kuttanad, the rice bowl of Kerala, where the soils are fairly well supplied with total potash no less than 78% of the soils

examined are seriously deficient in available potash. There can be no two opinions that these potash deficient soils need liberal potash fertilisation for good crop production. It may be noted here that paddy, coconut and tapioca which cover about 70% of the cultivated area in this State make very heavy demands on the soil for potash. The removal of K_2O per acre by these crops is of the order of 83 lbs., 123 lbs. and 230 lbs. respectively. Another point that is often overlooked is that the crops remove more of potash than any other nutrient as seen from the data in Table III. (1, 2, 8).

TABLE III.

Removal of nutrients by important crops.

Crop,	Yield/acre	lbs/ acre removed.		
		N.	P_2O_5 .	K_2O
Paddy	2000 lbs grain + 4000 straw	54	22	83
Coconut	3000 nuts	54	27	123
Tapioca	12 tons	54	45	230

Response of crops to Potash.

Until recently very few experiments were carried out in Kerala on manuring crops with potash. Since 1955 simple fertiliser trials have been conducted in this State on 'addy in cultivators' fields by the I. C. A. R. These trials were laid out under normal manuring conditions of the cultivators and the response to potash was studied over a dressing of nitrogen and phosphate. The average additional response to 20 lbs K_2O per acre on laterite and red soils was 2.5 qds. for 276 trials (6) The results also show that fertilisation of paddy with potash is profitable at 20 lbs and 40 lbs K_2O per acre. (5) The fertiliser demonstrations carried out on paddy, tapioca, pepper and ginger by Potascheme in collaboration with the State Department of Agriculture during 1957-60 have also given positive responses of varying magnitude to potash applied in combination with nitrogen and phosphate. (7) The data also indicate that investment on potash fertilisers is profitable and econo-

mic. As regards coconut, extensive fertiliser demonstrations carried out over a period of six years by Potascheme under the technical guidance of the Indian Central Coconut Committee show that balanced NPK manuring gives marked increase in yield and a good margin of profit. (3).

Conclusion.

It is quite evident from the soil test data and the experimental evidence on the positive response of different crops to potash that a very high percentage of soils in Kerala State badly need potash in addition to nitrogen and phosphate. Well balanced NPK manuring is, therefore, imperative to ensure satisfactory crop yields and potash must take its rightful place in all manurial programmes. It is also essential that a large number of experiments be carried out in the State to study the direct responses of different crops to potash and its interaction with nitrogen and phosphorus so that fertiliser recommendations could be made on a more sound basis.

LITERATURE CITED

- (1) Anonymous. 1957. Raise your tapioca yields by proper NPK manuring. (Potascheme).
- (2) Georgie, C.D. and Teik, G. L. 1932. The removal of plant nutrients in coconut cultivation. *Malayan Agri J.* 20: 358.
- (3) John, C. M and Jacob, K. 1960. Fertiliser Demonstrations on coconuts in West Coast. (Potascheme).
- (4) Nair, C. K. N. 1957. Fertilisers for Rubber. *Rubber Board Bull.* 4:7.
- (5) Raheja, P.C., Yawalkar, K. S. and Shrivastava, M. M. P. 1955. Crop response to potash under Indian conditions. *J. Ind. Soc. Soil Sci.* 6: 29.
- (6) Report of the results of fertiliser demonstrations in India conducted by I.C.A.R. (Rabi 1956-57).
- (7) Report of the fertiliser trials on paddy, tapioca, pepper and ginger conducted jointly by the Kerala Department of Agriculture and Potascheme during 1957-60 (unpublished).
- (8) Satyanarayana, P. 1956. The nutritional requirements of rice. *Fertiliser News* 1:6.