TABLE II.

Statistical analysis of the control trials on Pericyma glaucinans Guen.

S. No.	Treatments	Difference in proportion	Standard error	Significance
1.	DDT ·1 % / Aldrin ·1 %	0·12	0·050	No.
2.	DDT ·1 % / Dieldrin ·1 %	0.12	0·042	No.

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Potash Status of Nanjinad Soils

by

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Scope of work: Nanjinad is an important rice growing tract which belonged to erstwhile Travancore State but now is in Madras State. The paddy lands in this tract cover an area of 50,000 acres and are mostly double cropped. The soil as a rule is very productive but the strain of bearing an annual crop coupled with inadequate application of fertilizers is bound to result in the gradual depletion of plant foods.

Pillai and Iyer (1) who carried out the soil survey of this tract concluded that these soils are well supplied with potash based on total potash content. Some cultivators, have, however, expressed the opinion that satisfactory crop yields were not forthcoming in the absence of systematic applications of potash. This has led them to coin the proverb. 'Ash in the pot-dung in the hay'. In view of this, an investigation of the potash status of these soils was carried out by the author prior to inclusion of this area in Madras State.

Role of potassium in plant metabolism: The importance of potassium in plant metabolism has long been recognised. It is now known that this element acts as a carrier of nitrogen in the process of nitrogen absorption. Gerike (2) found that for the growth of rice, potassium, nitrogen and iron are required in large quantities.

Fairly large amounts of potassium occur in most soils, but all of them is not available to the plant. In point of fact, only very small proportions of the total potassium present in the soils are in readily available forms. The plants have therefore to depend on these minute quantities for energising the process of nitrogen absorption.

Gedroiz (3) estimated that only 6 percent on an average of the total potassium present is in the exchangeable or available form. Schoolenberger and Drabelhis Thorton (4) and Murphy (7) have all pointed to the importance of available potassium. It is estimated that 200 lbs. of available potassium per acre are required by root crops.

Experimental method: A number of samples of soil were collected from typical paddy lands in Nanjinad (Kanyakumari District). The total potash in the soils were determined by the A. O. A. C. method and the easily available potash by the method proposed by William (5).

The results of analysis are given in table below:

TABLE.

Total and Available Potash.

S. No.	Location of Soil	Total K_2O%	Easily available K_2O%	Percentage of available K_2O to total K_2O	Ca CO_3%
1	Boothapandy	0·057	0·002	3·5	3·2
2	,,	0·114	0·019	16·6	3·1
3	,,	0·461	0·0044	0·95	7·7
4	Erachakulam	0·150	0·012	8·0	2·1
5	Mannadi	0·146	0·017	11·7	2·7
6	Putherykulam	0·141	0·021	14·8	5·1
7	Kaverymedu	0·125	0·022	17·6	4·9
8	Vishnupuram	0·115	0·009	7·8	3·7
9	,,	0·101	0·007	6·9	3·2

TABLE *(Contd.)*

S. No.	Location of Soil	Total K_2O%	Easily available K_2O%	Percentage of available K_2O to total K_2O	Ca CO_3%
10	Mahadanapuram	0·076	0·001	13·2	4·1
11	,,	0·323	0·0015	0·46	4·7
12	Puthery	0·295	0·0013	4·4	3·7
13	,,	0·342	0·0013	3·6	6·1
14	,,	0·121	0·013	10·7	5·7
15	,,	0·052	0·009	17·3	3·1
16	,,	0·190	0·021	11·1	4·1
17	,,	0·175	0·0012	0·64	5·7
18	Thripathisaram	0·115	0·015	13·4	9·1
19	Vadasseri	0·171	0·009	5·3	1·9
20	Darasanamcope	0·073	Trace	...	2·9

Discussion of results: It may be observed that 16 out of the 20 soils examined showed a total potash content of less than 0·2 per cent which is generally accepted as the minimum requirement for paddy soils (6) and for normal soils by Murphy (7). These soils can, therefore, be expected to respond to the application of potassic fertilizers.

Plants mostly depend on the available forms of potash for their needs and hence the easily available form in soils should be considered more important than the total. The results (Table 1) show that even in soils (Nos. 3, 6, 12 and 13) very well supplied with total potash, the available forms are very low showing thereby that the criterion of minimum potassium level is to be reckoned on the easily available form. Hence, these soils too need potassic fertilizers to ensure normal growth. The soils under consideration are mostly derived from granite and contain appreciable amounts of feldspar and mica in which the potash is in a very difficultly available form.

It is possible however that in some of the soils studied the feldspar and mica might have undergone a greater degree of weathering than in others. It is significant to note in this connection that the soils having a high potash content were collected very near rocks and showed the presence of granite particles. Samples which showed high exchangeable potash were from fields receiving ash.

The presence of $CaCO_3$ might also explain the depression in available potash. Gedroiz (3) suggests that in presence of large amounts of $CaCO_3$, all the bases present on the surface of the primary particles of soil will be replaced by calcium, thus the soil may not have exchanged potassium, if they were not formed, during the process of further soil formation.

From the analytical data obtained in the present work it is fairly certain that the potash status of Nanjinad soils is by no means satisfactory and that liberal applications of potassic fertilizers may be necessary to ensure satisfactory crop production. This investigation corroborates the view held by the farmers in Nanjinad area that unless potash is added crops cannot be raised satisfactorily.

Summary and conclusion: The potash status of the Nanjinad rice soils both in respect of the total and easily available K_2O has been investigated by standard methods. It has been found that the 'available K_2O' is generally very poor. In certain samples examined the total was as high as 0·461, but it was found that these soils contained feldsparic forms of potassium which are generally not solubilised. Systematic and liberal applications of potassic fertilizers are necessary for maintenance of optimum potash status in these soils for rice cultivation.

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