SOIL TEST BASED FERTILIZER RECOMMENDATION FOR OZHALAPATHY WATERSHEDS

Ozhalapathy area of Palghat District lies in the Kerala-Tamil Nadu border characterised by a semi-arid climate. Soils in this area are neutral to alkaline in nature. Low and erratic rainfall and water scarcity are the major problems of crop production in this area. To conserve soil and water for better crop production on a watershed basis, seven watersheds, viz., Bavaji Nagar, Vellachikulam, Atteyampathy, Anipur, Sathram, Kalliampara and Kerampara have been identified. Since Ozhalapathy tract is different in climate and soil from rest of the Kerala state, there should be a specific fertilizer recommendation based on the specific soil characteristics of the watersheds of Ozhalapathy. The present study was carried out to determine the important soil characteristics of Ozhalapathy Watersheds so as to evolve a specific fertilizer recommendation for this area.

Fifty soil samples were taken from each of the seven watersheds and ten representative soil samples from each watershed were analysed for determining the properties namely, texture, pH, electrical conductivity, organic carbon, available P and available K. Soil pH and electrical conductivity were measured using a soil solution ratio of 1:2.5. Organic carbon was estimated using chromic acid method of Walkley and Black as described by Piper (1942). Organic matter and total N content of the samples were worked out from the organic carbon data. Available P was determined using Olsen extractant with a soil solution ratio of 1:20 and an equilibration period of 30 min. Chlorostannous blue colour method was used for the available P measurement (Jackson, 1958). The soil was extracted with normal neutral ammonium acetate using a soil solution ratio of 1:5 and an equilibration period of 5 min for the available K determination (Jackson, 1958).

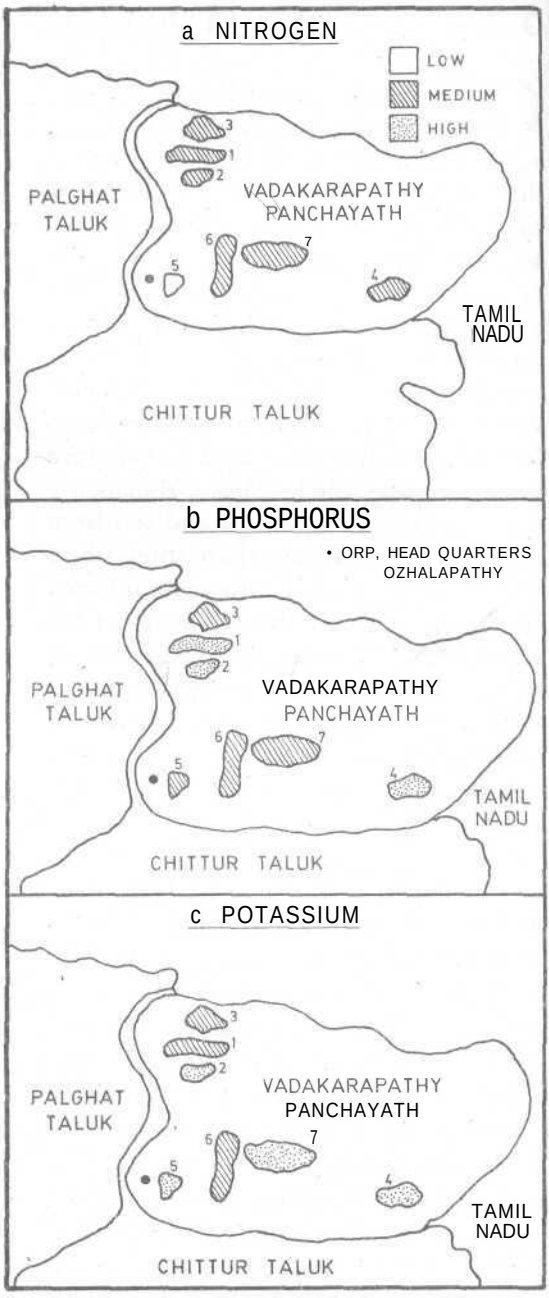
The general characteristics of soils in the seven watersheds are given in Table 1. Texturally soils of Ozhalapathy watershed are classified under sandy clay with the exception of Sathram watershed where the soil is clay loam. Total soluble salt (electrical conductivity) in the soils of Ozhalapathy watersheds is very low so that it does not interfere with plant growth. Vellachikulam, Atteyampathy, Sathram and Kalliampara watersheds are slightly alkaline in soil reaction and the application of gypsum may be recommended based on the crop need. Bavaji Nagar, Anipur and Kerampara watershed require no soil amendment since these soils are neutral in soil reaction.

Soils of Ozhalapathy watersheds except Sathram are medium in organic carbon. The organic carbon content varies from 0.46 to 0.61%. Sathram watershed belongs to the class 2 (0.34-0.5%), the texture being clay loam and 106% of the recommended dose of nitrogen will be required for the crops in this area. Soils in the other watersheds belong to the fertility class 4 (0.46-0.6%) except for Kalliampara which belongs to the class 5 (0.61-0.75%). For Kalliampara, 84% of the recommended dose of N may be sufficient and for all the other five watershed 91% of the

recommended dose of N will be required for raising a good crop.

With regard to the available P status of the soil, it was noticed that soils in Bavaji Nagar, Vellachikulam and Anipur watershed are high in available P. (24kg/ha). Bavaji Nagar and Vellachikulam belong to the fertility class 7 (24.1-27.5 kg/ha) and 48% of the recommended dose of P will be sufficient in these soils. Soils in Anipur watershed are very high in available P (31.86 kg/ha) which belong to the class 9 (31.1 - 34.5 kg/ha) and hence only 25% of the recommended dose of P may be applied. Sathram and Kalliampara belong to the class 5 (17.1-20.5 kg/ha) and 71% of the recommended dose may be given. Atteyampathy and Kerampara belong to the class 4 (13.6 - 17.0) and hence 83% of the recommended dose of P will be required.

Available K status also varied from medium to high among the watersheds. Bavaji Nagar, Atteyampathy and Kalliampara are grouped under medium and they belong to the fertility class 6 (236-275 kg/ha). In these soils 60% of the recommended dose of K must be applied. Vellachikulam, Anipur, Sathram and Kerampara are very high in available K the range being 309.1-444.96 kg/ha. Kerampara belongs to the class 7 (276-315) and 48% of the recommended dose of K may be given. The other two watersheds viz., Vellachikulam and Anipur belong to the class 9 and 25% of the recommended dose is sufficient in these soils. Sathram belongs to the class 8 (316-355) and 37% of the recommended K may be applied. Fertility of the Ozhalapathy watersheds is shown in Fig 1.



Rg 1. Soil fertility map of Ozhalapathy watersheds

1. Bavagi Nagar
2. Vellachikulam
3. Atteyampathy
4. Anipur
5. Sathram
6. Kalliampara
7. Kerampara

Table 1. Soil properties and available nutrient status of the watersheds of Ozhalapathy

Name of watershed	Organic carbon (%)	Available P (kg/ha)	Available K (kg/ha)	Texture	pH	EC (dS/m)
Bavaji Nagar						
Mean	0.46	24.89	243.10	Sandy Clay	7.50	0.09
Range	0.35-0.70	2.51-69.7	104-495		6.2-8.4	0.04-0.18
Vellachikulam						
Mean	0.49	24.14	376.75	Sandy Clay	7.71	0.10
Range	0.27-0.69	8.71-56.1	231-770		6.5-8.7	0.06-0.22
Atteyampathy						
Mean	0.47	15.33	274.45	Sandy Clay	7.79	0.10
Range	0.18-0.64	2.51-42.7	132-467		6.6-8.6	0.03-0.25
Anipur						
Mean	0.52	31.86	444.96	Sandy Clay	7.50	0.12
Range	0.41-0.86	2.51-215.9	231-990		5.7-8.6	0.04-0.25
Sathram						
Mean	0.42	19.15	354.75	Clay loam	7.80	0.13
Range	0.25-0.91	8.71-49.3	93-1292		6.3-8.7	0.04-0.32
Kalliampara						
Mean	0.61	20.43	242.55	Sandy Clay	8.00	0.13
Range	0.38-0.82	2.51-56.1	198-275		6.3-8.7	0.04-0.23
Kerampara						
Mean	0.53	15.06	309.1	Sandy Clay	6.91	0.06
Range	0.38-0.64	2.51-74.0	159-539		5.9-8.1	0.03-0.08

It is thus evident from the study that soils in the Ozhalapathy watersheds have physico-chemical characteristics that are favourable for plant growth. Economic crop production can be achieved in this area by the use of organic manures along with judicious application of fertilizers as per recommendations based on the soil test data.

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