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SURVEY AND EVALUATION FOR LAND USE INTERPRETATIVE GROUPING IN AGRICULTURAL RESEARCH STATION FARM SOIL, PARAMAKUDI

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ABSTRACT

Detailed soil survey of Agricultural Research Station Farm, Paramakudi and characterization of morphology were made. Padugai (Pdg) and Subramaniapuram (Sbm) series were identified and mapped. The rating of these soils for land capability, Storie Index and Productivity were of grade 'Fair'. Sbm series is placed into class A for soil irritability while Pdg series into Class B. Improvement in production can be made upto 220 and 250 per cent by scientific management in Sbm and Pdg series respectively.

Soil is the basic resource for meeting the needs of all life and a proper understanding of its properties is imperative for development of optimum land use plan. Soil Survey, provides information of the soil resources of an area and interpretation of soils' data leads to predictions. So, this study has been undertaken for detailed soil survey of Agricultural Research Station Farm, Paramakudi to investigate the morphological characteristics of the soil series and finally to arrive as the interpretative groupings and taxonomy for the different soil phases and to suggest management practices.

The farm is located on the Paramakudi - Madurai road in Ramanathapuram districts. It is geographically situated at 9É 3'N latitude and 78É 3'E longitude with an altitude of 32 m above MSL. It has an extent of 3.94 ha as garden land 6.03 ha as wetland. The tract is experiencing a long dry and hot summer and a very brief cold and rainy winter with unpredictable rains. The farm is on the right bank of the Vaigai River flowing towards Ramanathapuram. The area is frequently subject to cyclonic effect. Being an agricultural research station where research is conducted intensively, the detailed information of soil will have to be collected so that the research results can be extended to such of those soils elsewhere and hence the present investigation.

MATERIALS AND METHODS

A detailed soil survey of the farm was carried out using the cadastral map as the base material as per the procedure given by soil survey staff (1951). In each mapping unit (Soil series) three pedons were dug up at different places of the farm, examined, described as per

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the proccdurc and sampled horizonwise for laboratory analysis.

RESULTS AND DISCUSSION

The detailed soil survey map of the farm given in Fig.1 reveals that there are two mapping units, namely Pdg-s1-d5/A21, and Sbm-c1-d5/Ae1 (Pdg = Padugai soil series and Sbm = Subramaniapuram soil series) occupying 3.94 and 6.03 ha respectively. Important characteristics of the soils are furnished in Table - 1.

The comparative morphology of the two soils series is given in Table - 1. Based on the morphological, physical and chemical properties (Balasubramanian, 1987), the interpretative groupings on storie Index Rating (Storie, 1964), Land use capability classification (Soil Survey Staff, 1951), Soil and Land irrigability classifications (Anon, 1970) and productivity and potential productivity classification (Riquier et.al. 1970) along with coefficient of improvements were worked out (Table-2).

It is revealed that the Pdg and Sbm series fall under grade 3 (Fair) and pointing out the near marginal suitability for sustained use under agricultural in the light of the report by Mayalagu and Sree Ramulu (1981). The overall tract rating for this farm works out to 49 percent, falling under grade 3 (Fair).

In Pdg series, cultivation with caution especially during wet season is essential. Protection from erosion and overflow hazard from floods has to be attended to care for the health of this soil and sustain crop production. In the Sbm series, intensive drainage improvement and selection of crops adopted to some drainage problem and alkaline conditions are to be thought of. These interpretations are in similar line with the report of Chellamuthu (1987) for Ramanathapuram taluk salt affected soils.

The soil irrigability class 'B' of Pdg series indicates the moderate soil limitations (coarse surface texture, excess permeability, less available moisture retentivity and possible erosion) for sustained use under irrigation. The soil irrigability class 'A' of Sbm series indicates that it has slight limitations for sustained use under irrigation (less permeability more Kankar and alkalinity). These evaluations are similar to the report of Syed Ahamed Mirangi et.al. (1983) and Chellamuthhu (1987).

Both the series behave similarly in respect of productivity and potential productivity reflecting the effect of morphological, physical and chemical properties. On putting in enough additional resources and scientific improvement, both the soils could be converted to a potential productivity class 'good'. These are in line with the recommendations of Naidu et.al. (1986).

Considering the morphology, physical and chemical properties of the series the taxonomy of the soils is as follows: The Padugai series is a member of fine loamy, mixed non-calcareous, isohyperthermic family and typic Ustifluents. The Subramaniapuram series is a member of fine montmorillonitic isohyperthermic family of typic chromusterts (Soil Survey Staff, 1975).

The information collected will enable the scientists and agricultural Extension officers to extend the results of research in these soils to other places of the region where such soils occur.

SOIL MAP

Fig No : 1

AGRICULTURAL RESEARCH STATION, PARAMAKUDI

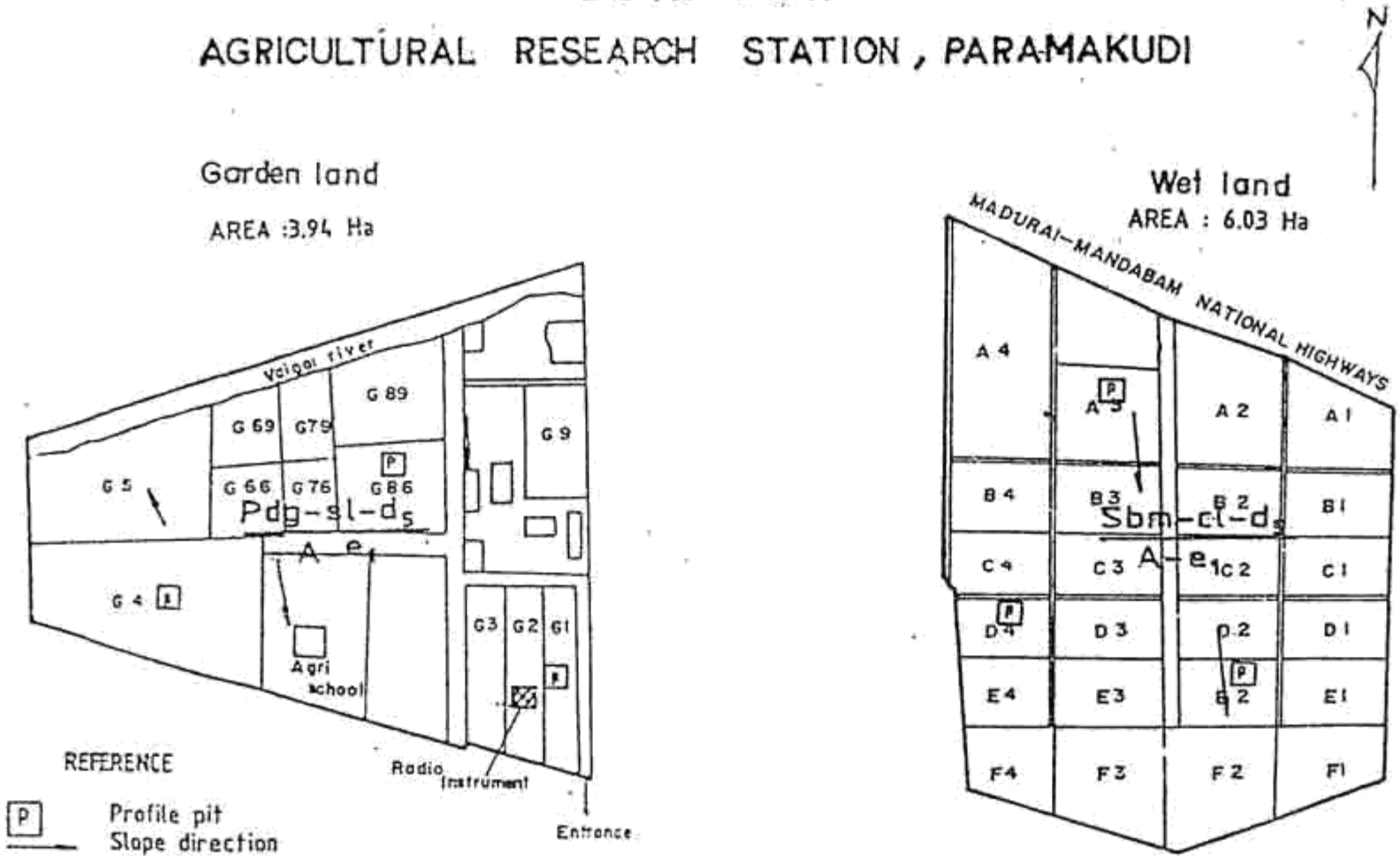

Table 1. Comparative statement of soils' Morphology in Agricultural Research Station, Paramakudi.

Morphological features	Padugai series (Pdg)	Subramanyapuram series (Sbm)
Parent material	River alluvium	Weathered geniss rich in lime kankar
Depth of colum	Very deep (d_5)	Very deep (d_5)
Physiographic position	Alluvial fan	Low land
Soil colour		
Surface	10 YR 5/3 (brown) to 10 YR 4/3 (dark brown)	10 YR 4/2 (dark grayish brown) to 10 YR 4/3 (dark brown)
Sub-surface	10 YR 5/6 (yellowish brown) to 10 YR 4/4 (dark yellowish brown)	10 YR 3/2 (very dark greyish brown)
Textured class		
Surface	nl	cl
Sub-surface	lu to mol	nicl to nic
Structure		
Surface	Medium to coarse, weak granular (m-c_1 gr).	Medium Moderate Sub-angular blooky/angular blooky (c_3 abk)
Sub-surface	Fine to medium, week to moderate, sub-angular blooky (f-m_1 abk)	Coarse, strong, sub-angular blooky/angular blooky (o_3 abk/abk)
Slickensides	Nil	Prominent intersecting wedge shaped structures and slickensides
Calcareousness	Non-calcareous	Highly caloarous
Internal drainage	Rapid	Very slow
Profile group	I	I
Soil reaction		
Surface	Moderately alkaline	Moderately alkaline
Sub-surface	Alkaline	Alkaline
Diagnostic horizon,		
Surface	Cohric epipedon	Ochric epipedon
Sub-surface	---	(Cubic) Wedge shaped structures with slickensides
Vertical cracks	Nil	2-3 cm wide cracks extending down to 91 cm.
Surface features	Nil	Both horizontal and vertical cracks gilgal micro relief and white salt encrustation.

TABLE - 2. Interpretative Groupings of Soils of Agricultural Research Station, Paramakudi

	Interpretative grouping	Padugai Series (Pdg)	Subramanlapuram Series (Sbm)
I	Storie Index Rating		
	Rating (Per cent)	43.93	52.33
	Grade	3 (Fair)	3 (Fair)
II	Land Use Capability Classification,		
	Class/Sub-class.Unit	III c. c-1	III w. c-2. 5. 6
III	Soil Irrigability Classification,		
	Class	B	A
IV	Land Irrigability Classification,		
	Class / Sub-class	2t	2d
V	Productivity Classification,		
	Rating (per cent)	20.60	21.71
	Grade	3 (Average)	3 (Average)
VI	Potential Productivity Classification,		
	Rating (Per cent)	45.79	55.23
	Grade	II (Good)	II (Good)
	Coefficient of improvement	2.2	2.5
VII	Crop Suitability Classification,		
	Wet land crops		
	Paddy	PS	US
	Sugarcane	US	MS
	Banana	US	MS
	Gardenland crops,		
	Millets	PS	MS
	Groundnut	MS	PS
	Cotton	US	HS
	Chilies	US	MS
	Coconut	MS	MS
	Vegetables	PS	HS
	Tapioca	PS	US
	Fruit trees	MS	HS
	Dry land crops,		
	Millets	PS	HS
	Cotton	US	HS
	Pulses	PS	HS
	Groundnut	PS	MS
	Chillies	US	HS

NB. HS - Highly Suited; PS - Poorly Suited; MS - Moderately suited; US - Unsuited.

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INFLUENCE OF TIME OF SOWINGS AND WEATHER FACTORS ON THE INCIDENCE OF LATE LEAF SPOT OF GROUNDNUT

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ABSTRACT

Late leaf spot of grondnut caused by Cercosporidium personatum is one of the serious diseases in groundnut. Time of sowing trails were conducted for both irrigated and rainfed conditions. The incidence of late leaf spot was high in the sowing taken up on 16-9-85 (rainfed) while minimum incidence was in the sowing on 1-7-85. In the irrigated season, maximum incidence was in the sowing taken up on 16-2-85 while minimum ws in 17-4-86 sowing. In bot seasons, early sowings recorded higher yield of groundut pods. There was negative association with disease intensity and yield parameters like shelling percentage and pod yields. Multiple regression studies with weather factors and late leaf

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