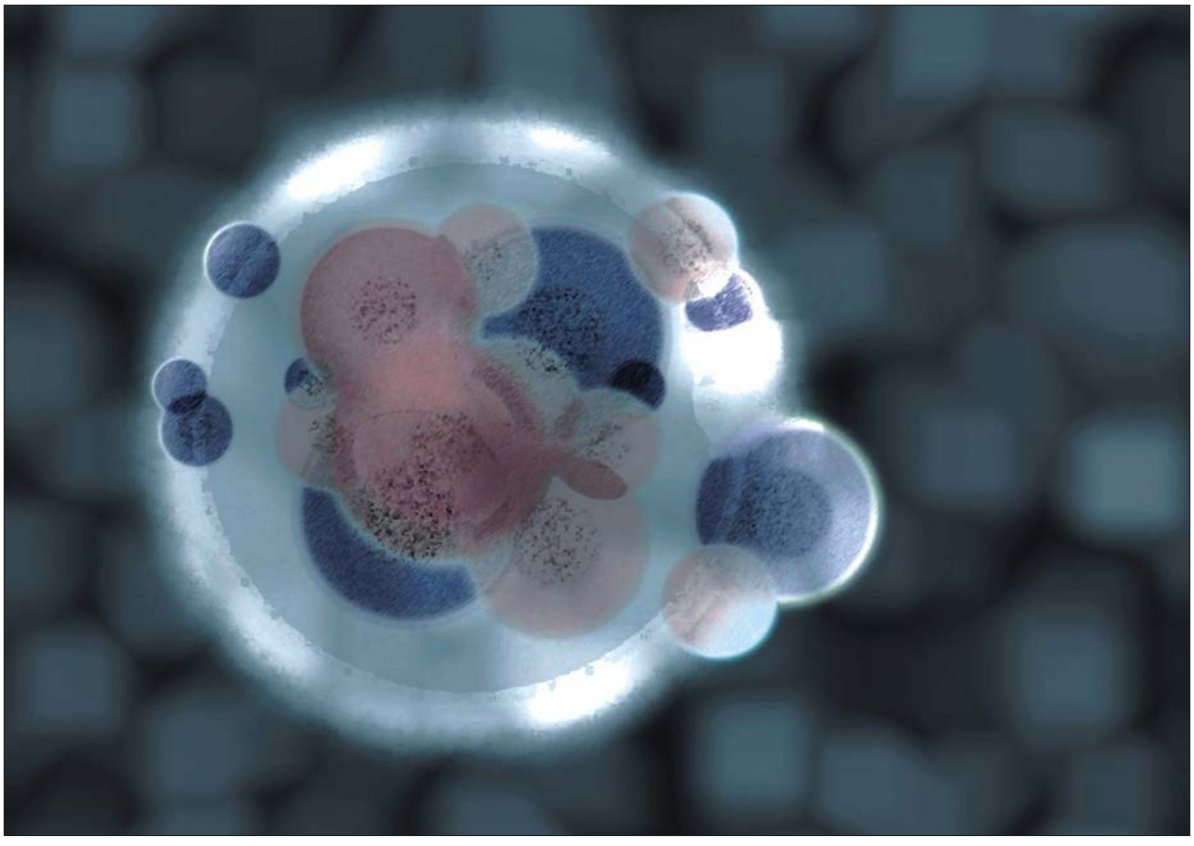

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Organic Matter Status of Tehsil Kahuta of District Rawalpindi

Sohail Jamil Qureshi[1],Ghulam Abbass[4], Sofia Bano[2],
Taj Muhammad[2], Mir Ajab Khan[1] and M.Yousaf[3]
[1] Department of Biological Sciences, Quaid-I-Azam University, Islamabad Pakistan
[2]Department of Chemistry, Postgradute College Abbottabad, Pakistan
[3] Department of Soil Science, University of Arid Agriculture Rawalpindi, Pakistan
[4]G and R Labs, OGTI, 1-9, Islamabad, Pakistan

Abstract: The study was conducted to evaluate the organic matter status of soil in the Kahuta tehsil from District Rawalpindi. Nintey composite soil samples were analysed for organic matter contents. Soil texture varied from sandy loam (Light) 20%, loam (Medium) 78% and Clay loam (Heavy) 2%. Organic matter was deficient in 100% soil samples.The maximum organic matter of 0.85% were recorded at Loona Kahuta site and minimum organic matter of 0.20% were observed at Kahuta and Dodheli site. The average maximum organic matter of 0.70% were observed at Loona Kahuta site. Fertilizer recommendations were given to farmers according to soil condition and organic matter status.

Key words: Organic matter, soil texture, salinity/sodicity, soil pH, Kahuta Tehsil

Introduction

Soil organic matter is most important factor for maintaining the soil fertility and cycling of carbon. Tiessen *et al.* (1994) reported that many tropical soils are poor in inorganic nutrients and rely on the recycling of the nutrients from soil organic matter to maintain fertility. In undisturbed rainforests such nutrients are recycled via the litter. The role of organic matter in soil fertility has been well known for hundreds of years, but the role of humus quality and its environmental functions has been discovered only during the last 30 years (Hargitai, 1993). The availability of N, P, K and organic content of the soil at 0 to15, 15 to 30 and 30 to 45 cm depths were estimated in a long term field experiment testing farm yard manure (F Y M) and fertilizer N doses in a pearl millet-wheat cropping sequence. Application of farmyard manure (F Y M) increased available P, K and Organic C content of soil at all depths and doses of fertilizer N (Gupta *et al*., 1992).

Scholes (1990) observed that in dry savannas, soil fertility has a controlling influence on the slope of the relation between annual rainfall and annual above ground herbaceous production. It also influences many other aspects of their structure and function, such as species composition, morphology, forage chemistry and degree and type of herbivore. Syres and Springett (1984) reported that earthworm redistribute organic materials within the soil, increase the soil penetrability and under certain conditions, influence ion transport in soils. They influence the supply of nutrients in several ways by increasing the rate of recycling.

Qureshi *et al.* (2000) analyzed forty eight composite soil samples from tehsil Gujar Khan of district Rawalpindi and reported that 100% soil samples were poor in organic matter contents. FarmYard Manure (F Y M) is especially beneficial as improved the physical conditions of soils and offset nutritional problems of the plants (Ghafoor *et al*., 1990).

During the present studies an effort has been made to assess the organic matter contents of tehsil Kahuta from district Rawalpindi.

Materials and Methods

Ninety composite soil samples from different sites of tehsil Kahuta of district Rawalpindi were collected from 0 to 15 and 15 to 30 cm depths to asses organic matter status of the soil. Previous crop history was recorded for formulating the recommendations. Samples were air dried, ground and passed through 2 mm sieve and analyzed for physico chemical characteristic in soil fertility survey and soil testing institute, Rawalpindi. Soil texture was determined by measuring saturation percentage of soil (Malik *et al.,* 1984). Soil pH was recorded (Schofield and Taylor, 1955) and electrical conductivity (EC) at 25°C was measured by preparing soil and water suspension (1:1) (Richards, 1954). Samples were analyzed for Organic Matter (Cottenie *et al*., 1979). The following criteria were used for classification. The data was subjected to statistical analysis for Standard Deviation and computation of Means (Table 1) (Steel and Torrie, 1980).

Results and Discussion

The data concerning soil pH, salinity /sodicity, soil texture and organic matter is given in (Table 1) and minimum, maximum and average values of all the determinations are given in (Table 2). The soil analysis data of different sites of Kahuta tehsil indicate that pH values of the area varied from 6.9 to 7.8 (Table 2). These soil samples were considered as normal, so that 100% soil samples were safe from salinity hazard (Table 1). According to Muhammad (1978) the area was free from salts but salinity and sodicity patches may develop later gradually due to application of brackish water either by pumped or collected from salts loaded run off in the reservoirs.

The soils are low in organic matter contents. Firstly because of arid climate resulting in a rapid degradation of the organic matter and secondly because of very little organic matter is added to the soil as the entire above above ground plant parts are removed from the fields. In the present study 100% soil samples were poor in organic matter contents (Table 1) .The soil texture of the area indicate that 20% soil samples were sandy loam, 78% loam and 2% were clay loam. According to Cottenie *et al*. (1979) soil organic matter tends to increase with increase in clay content of the soil. As the soil is loam to medium and rare in clay contents, due to this all soil samples were poor in organic matter. The farmers were recommended to use farm yard manure (F Y M) once in three years would promote the crop yield by improving physical, chemical,

Table 1: Number of soil samples analysed for soil texture, soil pH and salinity/sodicity and organic matter

Site	Soil Texture			Soil pH		Salinity /Sodicity				Organic Matter			
	L	M	H	<8.5	>8.5	N	S	SS	Sod	P	S	A	G. Total
Matoor	-	15	-	15	-	15	-	-	-	15	-	-	60
Dodheli	-	13	2	15	-	15	-	-	-	15	-	-	60
Loona-Kahuta	12	3	-	15	-	15	-	-	-	15	-	-	60
Kalar- Saidhan	-	15	-	15	-	15	-	-	-	15	-	-	60
Kahuta	-	15	-	15	-	15	-	-	-	15	-	-	60
Bohra- hayal	6	9	-	15	-	15	-	-	-	15	-	-	60
Total	18	70	2	90	-	90	-	-	-	90	-	-	360
%age	20	78	2	100	-	100	-	-	-	100	-	-	-
Mean	9	12	2	15	-	15	-	-	-	15	-	-	-
S D	3	4.5	0	0	-	0	-	-	-	0	-	-	-

L = Light (Sandy loam), N = Normal, P = Poor, M = Medium (Loam), S = Saline, S = Satisfactory
H = Heavy (Clay Loam), SS = Saline Sodic, A = Adequate, Sod = Sodic, S.D = Standard Deviation

Table 2: Minimum, maximum and average values of different determinations

Site	Soil pH			E C			Organic Matter		
	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
Matoor	7.4	7.7	7.5	0.35	0.45	0.38	0.30	0.40	0.35
Dodheli	6.9	7.5	7.2	0.10	0.30	0.20	0.20	0.40	0.30
Loona Kahuta	7.7	7.8	7.7	0.15	0.29	0.22	0.55	0.85	0.70
Kalar Saidhan	7.3	7.5	7.4	0.45	0.65	0.57	0.55	0.75	0.65
Kahuta	7.3	7.5	7.4	0.35	0.55	0.45	0.20	0.45	0.33
Bohra-hayal	7.5	7.7	7.6	0.35	0.50	0.42	0.35	0.55	0.45

biological and nutritional properties of the soil. The present study supports the view that production of most crops can be quadrupled with higher level of inputs and modern management (Mian, 1985).

It is concluded that the soil of tehsil Kahuta were highaly deficient in organic matter . There is no severe problem of salinity. The productivity of soil is declining due to imbalance use of fertilizer.

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