

Physico-Chemical Characteristics of soil in Sangamner Area of Irrigated Region

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ABSTRACT

A physico-chemical monitoring of major rivers in Sangamner area was done during the month of June and July 2015. Sangamner area distribute into two regions Pravara basin and Mula basin. For this fifteen soil sampling points were selected from Sangamner irrigated area (Pravara basin). The analysis was carried out for the parameters namely pH, acidity, alkalinity, calcium carbonate, organic carbon, available nitrogen, phosphorous, potash. Due to increasing demand for cash crops the practice of monoculture cropping pattern have further helped to deteriorate water as well as soil quality. Continuous use of chemical fertilizers slowly changed soil properties ultimately the production in long run is reduced. It has resulted in leaching of chemical into the surface and ground water. Therefore, it is essential to evolve and adopt a strategy of integrated nutrient supply by using a combination of chemical fertilizers, organic manures and biofertilizers.

Keywords: Soil Physico -Chemical Properties

I. INTRODUCTION

Sangamner area is located in the northern part of the Ahmednagar district of Maharashtra State. The Sangamner tahsil lies between 180 36' N and 1901' N latitude and between 740 1' W and 740 56' W longitude. The area is drained by the Pravara river, which originates in the hilly region of Western Ghats at Ratangarh. Geologically, basalts underlay the Pravara basin. In general the climate is dry and hot the average maximum temperature during summer is as high as 42⁰C in month of May and average minimum temperature falls up to 10⁰C during the month of December. The area receives rainfall, chiefly from the south west monsoon between June and September as the area falls under the rain shadow zone of Western Ghat and receives very low precipitation, annual rainfall ranging from 290 to 594 mm.

II. MATERIAL AND METHODS

In all 15 soil samples from study area were collected during summer 2015

While collecting soil samples the upper layer of vegetation, surface litter, stones stubble if any were cleared away and then layer of soil immediately below (0-15 cm) was collected in cotton cloth bag. The dried soil samples were pounded in wooden mortar and pestle and sieved through 2 mm sieve. The sieved soil samples

were used for physical and chemical analysis. From all of fifteen soil sampling stations were selected and present study have been considered as follows:

Table 1

S. No	Irrigated Village Name
S1	Khandgaon
S2	Nimaj
S3	Sangamner Kh.
S4	Gunjalwadi
S5	Ghulewadi
S6	Sangavi
S7	Sukewadi
S8	Ashvi Kh.
S9	Jorve
S10	Kolhewadi
S11	Rahimpur
S12	Chinchpur
S13	Sadatpur
S14	Umbari balapur
S15	Kharadi

III. RESULT AND DISCUSSION

In general, the soil in the study area is medium to high in fertility. Pravara rivers bank soils were dominated by medium black to black cotton soil with sandy clay loam

texture known as garden soils. Chemical properties of soil pH varied from 7.90 - 8.50 with the average value of 8.21 categorized alkaline in nature. (Table 2)

The electrical conductivity varies from 0.64 to 4.88 dSm⁻¹. Organic carbon content varies from 0.41 to 0.63 percent with an average value 0.52 percent indicating high productivity. Calcium carbonate ranges from 8.15 to 16.13 percent with average value 11.34 percent. The available nitrogen was in low category (less than 250

kg/ha) due to low mineralization. The available P₂O₅ classified in low class in all irrigated soil (10.41-38.6 kg/ha) while available potash content was in the very high range of class.

By the soil examination it has been concluded that the soils under the present investigations are enriched with potassium. Figure 1 shows Sangamner taluka fertility status of irrigated area - Pravara basin

Table 2. Chemical properties of soils from Sangamner area during summer 2009 (Average of 3 samples)- Pravara basin

Parameter	Irrigated area															Mean
	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	S ₁₁	S ₁₂	S ₁₃	S ₁₄	S ₁₅	
pH (1:2.5)	8.30	8.40	8.19	8.40	8.02	8.40	8.50	8.21	8.20	8.31	8.41	7.91	7.92	7.90	8.10	8.21
EC dSm ⁻¹	0.78	0.41	0.26	1.10	4.88	0.81	2.78	0.94	2.59	1.85	1.02	0.96	0.64	0.77	0.71	1.36
Ca ⁺⁺ meq%	13.4	14.4	20.32	19.01	20.42	23.01	12.61	11.6	28.49	22.94	18.14	18.30	14.60	15.20	14.21	17.78
Mg ⁺⁺ meq%	16.70	20.67	25.55	14.10	20.05	14.78	19.02	15.2	17.24	15.14	20.5	11.60	11.70	23.12	12.15	17.74
Na ⁺ meq%	0.34	0.44	2.35	0.61	0.95	0.85	0.52	0.53	1.32	0.84	0.81	0.52	0.80	0.48	0.38	0.78
CaCO ₃ %	12.4	10.8	9.10	12.09	12.11	11.09	8.15	10.83	15.24	9.42	16.13	9.16	10.17	9.50	14.04	11.34
Organic carbon%	0.52	0.45	0.50	0.58	0.47	0.55	0.51	0.60	0.41	0.55	0.62	0.63	0.47	0.45	0.60	0.52
Organic matter %	0.89	0.77	0.86	0.82	0.81	0.94	0.87	1.03	0.84	0.94	1.06	1.08	0.81	0.77	1.03	0.90
Available N kg/ha	148.52	120.40	210.11	110.42	145.16	130.42	83.90	145.0	289.54	150.51	220.71	131.0	154.0	178.0	145.0	157.51
Available P kg/ha	16.04	10.41	17.24	33.0	28.0	38.6	31.8	12.59	16.0	31.6	33.0	31.6	30.8	35.1	12.0	25.38
Available K kg/ha	365.11	390.22	611.7	370.40	509.62	770.4	312.2	610.3	680.2	693.65	516.4	539.0	464.0	597.0	545.0	531.68

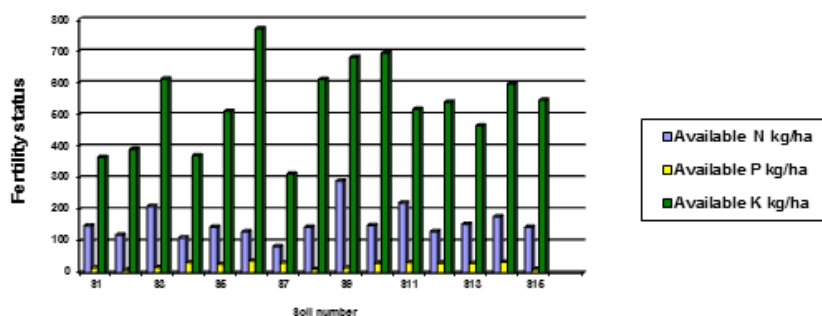


Figure 1. Sangamner taluka fertility status of irrigated area - Pravara basin

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