Physico-chemical characteristics of the soil samples from the Morena city (M.P.)

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***Abstract*— The investigation was carried out in the high traffic density at Morena (M.P.) to evaluate soil pollution both quantitatively and qualitatively. In this study, different physico-chemical parameters and available macronutrients of contaminated soil sample have been analyzed. The result show that the untreated industrial effluents and domestic sewage contaminates of soil quality of Morena city.**

***Index Terms*—soil, physicochemical properties, Morena city**

I. INTRODUCTION

The pollution of soil by heavy metals from automobile sources is a serious environmental issue. Result show that roadside soil near motorways is heavily polluted by heavy metals from automobiles [1-2]. Change in the composition of he urban atmosphere are caused largely by traffic induced pollutants[3] mainly carbon monoxides, nitrogen monoxides, dust as well as various types of hydrocarbons[4]. Secondary trace gases which can be formed from these precursor substances in certain photochemical reactions. Organic manures in addition to supplying essential nutrients to the current crops very often leave substantial residual effects on the succeeding crop in the cropping system. This residual effects lasts for several session several researcher presently, there has been a shift in the research priority from crops to cropping system considering the effect of N, P, K and S. soil is extremely complex medium and its variability causes many problem in analyses and in the interpretation of the analytical results. Since soil is the basis of the rooted plants, soil pollution can adversely affect the quality and quantity of the crops grown over it[5-6]. Irrigation water quality has been found to significant affect chemical and physical properties of soil[7]. The location of Morena city is between is between two important and historical cities Agra and Gwalior by national highway No. 3. The present study is a modest attempt to find a solution both, to enhance crop yield through increased soil fertility organically without further degrading its status and keep the pathogens and pest at bay through the use of natural pest repellants, pesticides and employing biological best control methods[8].

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II. MATERIALS AND METHODS

The soil samples were collected from Morena city at different depths by post hole auger carefully from four different points with different sides. Samples were collected from the depth of 0", 12", 24" and 36" with distance and direction from the reference (Agriculture centre, Morena) which is zero traffic zone, given in table 1 and 2. The soil sample was dried and then washed upto powdered state. Physico-chemical parameters of the soil were measured as per standard procedure[9-10]. The N. P, K, and organic carbon were estimated through the procedures suggested by ICAR methods[11].

III. RESULTS AND DISCUSSION

Analytical results of different soil samples taken from the four different sides are given in table 1-2. It was found that the pH values were ranging from 7.2 to 7.6. The minimum and maximum values obtained at 36" depth from the soil sampling station S-1 and 0" in soil sample station S IV. These ph values are indicating the slightly alkaline nature of soil nature. The observed organic carbon contents were ranging from 0.41% to 0.69%. The maximum values was noticed it 36" depths from the sample station S-I and the maximum amounts was observe at 0" depth from the S-IV sample station. The results show that the available organic carbon values decreases with the increase in the depth in the soil profile. Thus, the agriculture land has low soil porosity that reduces the growth of the soil microorganisms. The results of electrical conductivity of the entire investigations are tabulated in table 1-2. The minimum value was noticed at 36" depth from the sample station S-1 and the maximum amount was observed at 0" depth from the sample station S-IV. Electrical conductivity (EC) is the most common measure of soil salinity and is indicative of the ability of an aqueous solution to carry an electric current. Plants are detrimentally affected, both physically and chemically, by excess salts in some soils and by high levels of exchangeable sodium in others. By agricultural standards, low values of EC indicate nutrient deficiency. The estimated available nitrogen content was ranging from 132 to 189% $kgha^{-1}$. The minimum value was observed at 36" depth from the sample station S-II and the maximum value was observed from the sample station S-II at 0" depth. Organic residues that have low nitrogen content can cause nitrogen deficiencies in plants as microorganisms decompose the organic compounds. The minimum value

Table 1- Pysico-chemicals parameters of the various soil samples of Morena City

Parameters	S-I Noorabad 8/50" L				S-II Noorabad 8/50" R			
	Depth				Depth			
	0"	12"	24"	36"	0"	12"	24"	36"
pH	7.4	7.4	7.3	7.2	7.4	7.4	7.3	7.3
$CaCO_3$%	230	219	201	206	240	225	210	220
Organic carbon (%)	0.51	0.50	0.45	0.41	0.53	0.49	0.44	0.46
EC (dsm^{-1})	0.30	0.21	0.16	0.12	0.31	0.26	0.19	0.15
Nitrogen ($Kgha^{-1}$)	181.6	170.2	156.1	134.50	189.1	176.00	151.00	132.00
phosphorus ($Kgha^{-1}$)	10.1	9.80	10.10	9.40	12.4	11.8	11.4	10.9
potassium($Kgha^{-1}$)	457	401	421	390	467	429	420	394
sulphur ($Kgha^{-1}$)	21.4	20.1	19.2	18.6	21.6	19.6	19.2	18.4
WHC	32.12	30.16	34.16	36.60	36.28	34.10	34.90	36.60

Table 2- Pysico-chemicals parameters of the various soil samples of Morena City

Parameters	S-III Banmor 16/50" L				S-IV Banmor 16/50" R			
	Depth				Depth			
	0"	12"	24"	36"	0"	12"	24"	36"
pH	7.6	7.4	7.2	7.2	7.1	7.6	7.4	7.4
$CaCO_3$%	259	248	230	220	276	261	240	236
Organic carbon (%)	0.61	0.59	0.54	0.41	0.69	0.64	0.59	0.50
EC (dsm^{-1})	0.41	0.31	0.29	0.26	0.42	0.34	0.29	0.27
Nitrogen ($Kgha^{-1}$)	162	154	144	139	165	156	151	136
phosphorus ($Kgha^{-1}$)	13.22	12.90	12.10	11.90	14.21	13.24	12.61	12.21
potassium ($Kgha^{-1}$)	441.2	401.0	409.0	390.0	439.1	414.0	396.0	391.0
sulphur ($Kgha^{-1}$)	22.4	21.9	20.9	20.1	22.8	21.9	20.7	19.7
WHC	39.1	38.1	41.7	44.7	39.7	38.4	41.6	43.6

of available phosphorous was 9.40kg/ha at 36" depth from S-I and the maximum content of available P was 14.21 kg/ha from the sample station S-IV at 0" depth. During the whole study the potassium values were reported in the range of 360 Kg/ha to 439.1 kg/ha. The minimum content was observed at 36" depth from S-I and S-III sample station and the maximum content observed at 0"depth of S-IV station. The observed potassium values are favorable throughout the study [12]. The minimum and maximum range of sulphur was 18.4 ka/ha at 36" depth of S-II station and 22.8 kg/ha at 0" depth of S-IV sample station. The present study shows that most of the parameters decreased with the increase in the depth with some exception in WHC values which might be due to the leached out. The results indicate that the available organic carbon percentage is very low in all the soil samples which is due to the use of inorganic manures in high quantity. So water holding capacity and cation exchange (CEC) of soil are low in the present study area. The use of organic manures in the soil at the time of cultivation is suggested to the formers. Available nitrogen content decreases with the increase in the depth, probably due to the presence of nitrifying bacteria. Finally, a positive correlation originates in two significant soil quality parameters i.e., organic carrbon and nitrogen content.

IV. REFERENCES

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