Soil Salinity study of Daskroi Taluka, Ahmedabad, Gujarat

Chemistry

Mahesh R. Solanki	Asst. Professor, Chemistry Department, Gujarat Arts and Science College, Ahmedabad
Sanjay J. Parmar	Asst. Professor, Chemistry Department, Gujarat Arts and Science College, Ahmedabad

ABSTRACT *The prime concern of this study is to measure productivity and salinity of Daskroi taluka, Dist. Ahmedabad. Soil salinity and productivity is depends on various parameter like morphology, physico- chemical parameters and biological constitute. This study is particular focus on salinity and fertility status characteristics. Sample were analysed from Daskroi taluka Dist Ahmedabad because this area surrounded to industrial activity. The result revealed that EC ranged between .0.19 to 1.72. Main objective of this soil analysis is to evaluate soil electrical conductivity as per Government of Gujarat Agriculture department lab manual under soil health card project.*

Introduction:

Now a day's agriculture is under tremendous pressure to produce sufficient food for huge population, for survive of everyone need food and it's obscured from soil after cultivation process. Present context repeated cultivation required for food security. Soil play key role in agriculture production .So for that we think about soil health, soil nutrient, soil properties and various soil parameter that decide soil fertility and productivity. There are different parameters which define soil productivity. In all these parameter salinity of soil is also valuable .Electrical conductivity of soil increased with deterioration of eco system. In other words soil salinity enhance with degradation of soil or desertification of soil. According to Donahue et al (1983) excessive concentrations of salt may kill growing plants. Salinity appears to affect two plant processes, Water and ionic relations (Cramer and Nowak1992).During ite initial stage of interaction the plant experience water stress and the plant experience osmotic pressure effect related to ionic effects. High salinity of the soil reduced the adsorption of nitrogen and phosphorous by young plan. . Salinity of soil can be determined by measurement of Electrcal conductivity. The Electrical conductivity gives an indication of salt concentration of soil.

Present study is an attempt to find out the salinity of soil of Daskroi taluka, Ahmedabad, Gujarat. This study helps farmers to decide the amount and the type of fertilizer to be added to soil to make the more fertile. In sort the objective of this paper was to analyze the trend in fertility status of soils of Daskroi taluka of Gujarat State.

In this work, analysis is used to study 22 random, medium black and goradu(sandy loam) soil samples collected from different farm sites of Daskroi taluka villages.

2. The Study Area:

Ahmedabad district is the central part of Gujarat State in western India. It is divided into ten talukas. Daskroi is one of them has 71 villages, covering an area of 656 sq.kms. Daskroi is located between $23^0.006^'$ North (latitude) and $72^0.6674^'$ East (longitude). The temperature range is 45ºC (max.) and 7ºC (min.). Average rainfall is 756 mm. Daskroi is one of the important tehsil of ahmedabad. Daskroi tehsil consist of 71 villasges.In this study, covered 20 villages, these area consist of agricultural land of different villages of Daskroi taluka Dist. Ahmedabad.

Major three types of soils, there are medium black, sandy and hydromorphic. Major crops are grains, cotton and different horticulture crops. From the collected data at different science colleges and STL are under the soil health card program by Government of Gujarat, India. We
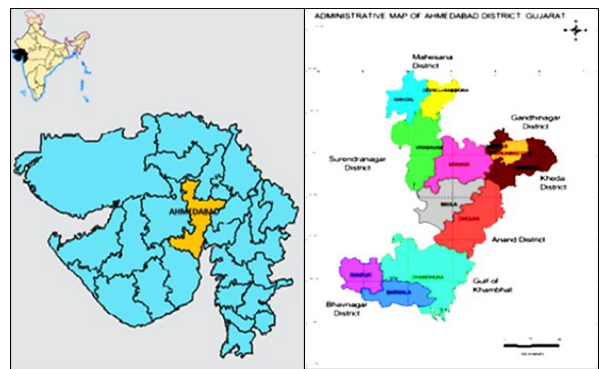
have selected medium black and goradu(sandy loam) soil samples of Daskroi taluka for present study.

In this work, taken 20 village soil samples were randomly collected from different farm sites of Daskroi taluka villages.

3. Soil Sampling and Analysis:

Soil samples were sampled by a systematic sampling strategy at 0 to 20 cm depth below the surface. The samples were dried and passed through a 2 mm sieve to prepare them for testing. All the samples were tested using standard method by following the "Methods Manual-Soil Testing in India". The samples were analyzed for Electrical conductivity on equiptroncs condutometer.

4. Tools and Techniques:

Minimum and maximum are calculated for measured soil conductivity. We have derived and analyzed the all above mentioned samples data according to Government of Gujarat, Agriculture Department Soil Testing Laboratory Manual.

Table 1: Soil parameters of selected samples from the sample sites.

Sample Site	L.S. No	E.C mili mho/cm	Sample site	L.S. No.	E.C. Mili mho/cm
Khodiyar	24	.58	Zanu	561	0.5
Khodiyar	129	0.9	Zanu	564	0.51
Khodiyar	55	1.05	Zanu	659	0.29
Kashindra	772	1.54	Bhat	518	1.11
Kashindra	1373	1.32	Bhat	469	1.3
Kashindra	826	1.25	Bhat	476	1.12
Oad	426	0.18	Aenasan	229	0.77
Oad	521	0.56	Aenasan	212	0.9
Oad	196	0.41	Aenasan	595	0.74
Kuha	57	.2	Pardhol	25	0.46

kuha	316	.83	Pardhol	28	0.73
kuha	995	0.9	Pardhol	292	0.82
Pasuj	329	0.19	Vahelal	225	0.82
Pasuj	232	.2	Vahelal	682	1.62
Pasuj	395	0.45	Vahelal	251	1.7
Chadiyol	510	0.69	Kathvada	466	0.99
Chadiyol	267	0.21	Kathvada	384	0.86
chadiyol	304	.41	Kathvada	45	0.88
Ranodara	762	.30	Bilasiya	38	0.28
Ranodara	303	.23	Bilasiya	22	0.36
Ranodara	392	.64	Bilasiya	177	.32
Chavalaj	338	.48	Nadej	50	0.48
Chavalaj	150	.28	Nadej	299	0.54
Chavalaj	156	0.78	Nadej	93	0.38
Govindada	326	.2	Barejadi	76	0.18
Govindada	16	0.44	Barejadi	99	0.25
Govindada	87	0.52	Barejadi	109	0.19
Lapkaman	141	0.23	Mahijada	205	0.95
Lapkaman	122	0.3	Mahijada	194	0.71
Lapkaman	67	0.39	Mahijada	109	1.02
Undrel	133	0.28	Bareja	75	0.83
Undrel	55	.44	Bareja	77	1.52
Undrel	362	.73	Bareja	461	1.72.
Dhamanava	965	.19	Singarava	127	1.62
Dhamanava	1348	.33	Singarava	194	1.08
Dhamanava	656	.69	Singarava	225	1.03
Aslali	16	.34	Bhuval	283	0.14
Aslali	530	.41	Bhuval	236	0.11
Aslali	388	.86	Bhuval	40	0.10
Timba	505	.99	Harniyav	776	0.19
Timba	296	0.2	Harniyav	121	0.3
Timba	402	1.2	Harniyav	663	0.25

Table 2: Interpretation of soil salinity properties

Parameters	Interpretation	
Electrical conductivity	0-2	salt free
	2-4	Very slightly saline
	4-8	Slightly saline
	8-13	Moderately saline
	>16	strongly saline

5. Results and Discussion:

The electrical conductivity value of soil samples are varied from 0.19 to 1.72 mili mho/cm so in salinity context result shows samples are salt free (as per table 2).Electrical conductivity of soil depends upon temperature; ion concentration and type of ion present in the soil.EC influenced growth of plant. Soil EC is depend on numerous factor such as soil, porosity, concentration of dissolved electrolyte texture, quantity and composition of colloid; organic and inorganic matter cation exchange capacity (CEC) exchangeable Ca and Mg, clay content, moisture content in the Soil EC also affected by water used during irrigation. The EC of soil depending upon the amount of moisture bind by soil particle, Silt have a moderate conductivity, Sand have a low conductivity and clay have a highest conductivity. EC is a electrolytic process that take s place through water -filled pores. Anion(SO_4,Cl,NO_3,HCO_3) and Cation (Ca^{+2},Mg^{+2},K^+,and Na^+) from salt dissolved in soil water carry electrical charges and conduct the electrical current. Ultimately the concentration of ions was determining the EC of soil.

6. Conclusion:

Following conclusions from this study can be made for the medium black soil of Daskroi taluka Ahmedabad district in Gujarat state.

• Analysis shows electrical conductivity of samples between .019 to 1.72 mili mho /cm range in study Daskroi taluka.
  electrical conductivity (EC) is A significant indicator in agriculture business. The EC of soil should be considering important parameter in agriculture crop productivity. The EC of soil may be give detrimental impact on sandy mineral soil.

• Generally EC range between 0 to 1.0 mili mhos suggested soil health is good. In this analysis EC measurement value above 1 to 2 mili mho /cm responsible for low growth of salt sensitive plant due to destruction of the microbial mediated process of nitrification and denitrification.

• Highest EC recorded is 1.72 mili mho /cm at L.S.No 461 at Bareja viilage site.

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