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Soil Phosphorous study of Daskroi Taluka, Ahmedabad, Gujarat.India.

Chemistry

KEYWORDS: soil phosphorous , soil fertility , Soil analysis, Daskroi

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ABSTRACT

Soil fertility is important for crop production and it is determined by various parameters like electrical conductivity ,alkalinity,acidity,nitrogen,phosphorous,organic carbon and available potassium,This soil analysis paper revealed proportion of phosphorous in soil of Daskroi taluka, Dist. Ahmedabad .It shows villages of this taluka possess low,medium,high, proportion of phosphorous.This soil analysis results are useful to farmer to rectify the problem arised due to out range of phosphorous and helpful to decide how much quantity of phosphorous fertilizer blend with soil for increasement of crop production. Soil phosphorous and productivity is depends on various parameter like morphology, physico- chemical parameters and biological constitute. . Sample were analysed for Soil phosphorous determination from Daskroi taluka Dist Ahmedabad because this area surrounded to industrial activity . The result revealed that available phosphorus ranged between 24 to 100 kg/ha.Main objective of this soil analysis is to estimate phosphorous as per Government of Gujarat Agriculture department lab manual under soil health card project.

INTRODUCTION:

Various basic soil elements are required for growth of crops ,These element classified under basic three category, macro element, micro element and trace element. The macro element are carbon,hydrogen,oxygen,nitrogen,phosphorous,potassium,calcium ,magnesium and sulfur .Macro elment play important role in growth of crops.The water and atmospheric gases are basic source carbon,hydrogen and oxygen.Plant obtain nitrogen from environment with help of nitrogen fixing bacteria.The other essential macro nutrient present in soil is phosphorous which is exist in two different condition either complex and insoluble condition or simple and soluble forms.

Phosphorous is second most critical crop nutrient. It is estimated that 0.1 percent of the total weight of the soil is made up from phosphorous. But only 1 percent of it is available to crops.

Organic P in soils. A large number of compounds make up the organic P in soils, with the majority being of microbial origin. Organic P is held very tightly and is generally not available for plant uptake until the organic materials are decomposed and the phosphorus released via the mineralization process. Mineralization is carried out by microbes, and as with nitrogen, the rate of P release is affected by factors such as soil moisture, composition of the organic material, oxygen concentration and pH.

The reverse process, **immobilization**, refers to the tie-up of plant-available P by soil minerals and microbes that use phosphorus for their own nutritional needs. Microbes may compete with plants for P, if the decomposing organic materials are high in carbon and low in nitrogen and phosphorus . *Mineralization and immobilization* occur simultaneously in soil. If the P content of the organic material is high enough to fulfill the requirements of the microbial population, then mineralization will be the dominant process.

Inorganic P in soils. The concentration of inorganic P (orthophosphates) in the soil solution at any given time is very small, amounting to less than 1 lb/A. Phosphorus in the inorganic form occurs mostly as aluminum, iron or calcium compounds.

The chemistry of soil P is very complex, with more than 200 possible forms of P minerals being affected by a variety of physical, chemical and biological factors. Soluble P resulting from commercial fertilizer applications or from mineralization reacts with soil constituents to form P compounds of very low solubility (low plant availability). This series of reactions is commonly referred to as **sorption** or **fixation**. Iron and aluminum compounds will fix (tie-up) P under acidic conditions (soil pH < 6), while under alkaline conditions (soil pH > 7), phosphorus is preferentially fixed by calcium and magnesium compounds. Figure 5 shows the sequential process by which plant-available phosphorus is fixed by soil minerals Phosphorus availability to plants in most soils is greatest when soil pH is in the range of 6 to 7. Application of liming materials is a common production practice to raise the pH in acidic soils to make P more available. However, lowering the pH of calcareous soils to increase the solubility of P is not an economically viable option, since large amounts of acidifying material are typically needed. Thus, soils with high pH generally have P fertilizer applied every year immediately before planting the crop.

In present contex repeated cultivation required for food security. Soil play key role in agriculure production .Therefore we think.there are different parameters which define soil productivity.In all t hese patrameter soil **Phosphorous** is also valuable .

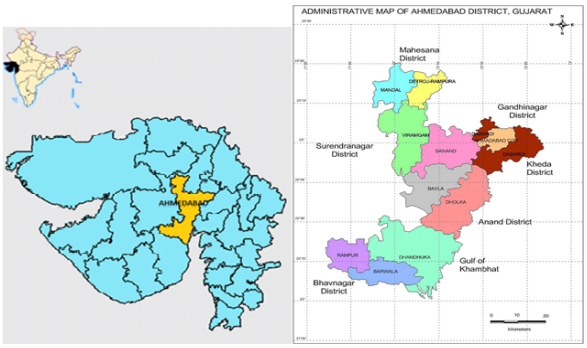
Present study is an attempt to find out the **Phosphorous** of soil of Daskroi taluka Ahmedabad, Gujarat.This study helps farmers to decide the amount and the type of fertilizer to be added to soil to make the more fertile. In sort the objective of this paper was to analyse available phosphorous trend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

In this analysis study collected randomly 28 village sample of medium black and goradu(sandy loam) soil . from different farm sites of Daskroi taluka Dist.Ahmedabad.

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 45°C (max.) and 7°C (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 --village are Khodiyar, kuha ----these area of study is 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 under the soil health card program by Government of Gujarat, India.



3. SOIL SAMPLIING 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 analysed for **Phosphorous** on equiptroncs colorimeter

4. TOOLS AND TECHNIQUES:

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

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

Sample Site	L.S. No	Available phosphorous Kg/Ha	Sample site.	L.S. No.	Available phosphorous Kg/Ha
Khodiyar	242	24	Zanu	192	
Khodiyar	376	30	Zanu	219	47
Khodiyar	267	61	Zanu	200	40
Kashindra	1390	44	Bhat	403	71
Kashindra	1372	39	Bhat	451	54
Kashindra	1129	31	Bhat	604	59
Oad	11	37	Aenasa	62	58
Oad	120	28	Aenasa	10	26
Oad	345	75	Aenasa	47	58
Kuha	1277	91	Lalpur	73	34
kuha	1878	98	Lalpur	76	24
kuha	2047	79	Lalpur	153	37
Pasuj	728	48	Kubadt	61	69
Pasuj	803	42	Kubadt	811	44
Pasuj	163	51	Kubadt	606	34
Chadiyol	632	89	Bhuval	529	40
Chadiyol	350	95	Bhuval	942	54
chadiyol	529	100	Bhuval	158	27
Ranodara	193	39	Lilapur	77	42
Ranodara	228	46	Lilapur	110	49
Ranodara	74	27	Lilapur	103	
Chavalaj	103	95	Nadej	628	31
Chavalaj	301	39	Nadej	357	40
Chavalaj	225	58	Nadej	297	31
Govindada	92	37	Barejad	17	98
Govindada	28	47	Barejad	114	88
Govindada	290	27	Barejad	75	41
Lapkaman	258	27	Mahijada	636	36
Lapkaman	317	60	Mahijada	728	25
Lapkaman	42	57	Mahijada	35	79
Undrel	22	42	Bareja	81	92
Undrel	78	40	Bareja	246	33
Undrel	27	35	Bareja	999	27
Dhamanava	475	27	Singarava	4	83
Dhamanava	965	25	Singarava	154	63
Dhamanava	193	30	Singarava	127	47
Aslali	84	37	Bhuval	6	33
Aslali	95	30	Bhuval	283	45
Aslaali	160	32	Bhuval	40	67
Timba	47	20	Harniyav	592	31
Timba	404	81	Harniyav	796	33
Timba	439	86	Harniyav	58	87

5. RESULTS AND DISCUSSION:

Table 2 represents the range of Low, Medium and High Phosphorus content as per standard of soil analysis, it is the permissible standard according to Anand Agricultural University. This values are used to determine the category of soil whether the soil sample have Low Medium or High content of Phosphorus.Experimental values of quality characteristics especially for available Phosphorus of soil of the Daskroi taluka. presented in .Table 1 represents the number of samples taken from different villages. Data presented in Table 1 shows that soils of few villages contain lower available Phosphorus and few villages have high range of available Phosphorus that might be due to poor or excessive use of fertilizers. Wide range of infect average all the samples lies in medium range indicates good quality of soil suggest sufficient amount of presence of available Phosphorus and hence no need of nutrient supplements to this soil. Results are in tune with farming practices followed by farmers of this region. Most of the farmer's are using compost and chemical fertilizers, urea and phosphatic fertilizers only, since last 25 to 30 years which contains concentrated amount of nitrogen and organic carbon, potassium and phosphorus. On the basis of these results farmers are advised to use integrated nutrient management practice to maintain optimum concentration of all the essential nutrients for plants. Farmers are also advised to add biofertilizers. The graphical representation clearly confirms the recent status of all 28 villages for the presence of available Phosphorus in their soil.

6. CONCLUSION:

Analysis shows available phosphorous of samples between 24 to 100 kg/ ha range in study Daskroi tehsil. This can be concluded from this study that the available Phosphorus deficient soil is recommended for Phosphorusrich fertilizer. Average all villages have medium category of available Phosphorus so no need to add Phosphorus contained fertilizers.

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