ORIGINAL ARTICLE

'Studies On The Soil Quality Parameters And Awareness Among The Farmers In Selected Region Of Nashik, Maharashtra,'

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Abstract:
For the present study, sampling had been carried out for two years i.e. from march 2006-2008.Twenty-eight different locations were selected for the study. After the harvest of crop soil samples were collected as the dry soil as that time. Soil auger was used for sampling. The number of samples was collected according to the size of field. The salt content present in the given soil sample can be estimated by electrical conductance measurement. Organic carbon shows random trend, no exact trend was found. In study area the available nitrogen found in the ranges between 211 to 590 kg ha-1 .The studies revels that the degree of acidity or alkalinity of soil finds mildly, moderately alkaline i.e. optimum range. EC increases as percent of calcium carbonate increase. High amount of available nitrogen found indicates the over use of nitrogenous fertilizers. Maximum numbers of farmers were used advance technology for farming.
 Keywords: Fertilisers, soil, microorganism, chemical parameters.

INTRODUCTION

Farming is the important part in the economy of India. Total 76 % population is directly or indirectly depending on agriculture. Rural population is completely depending on agriculture. The total National Income from farming is around 32%.

The study of agricultural chemistry is a scientific discipline concerned with the plant, soil, water and fertilizers [2]. Due to continuous cropping pattern, soil becomes depletion of nutrients. The use of different fertilizers and pesticides soil gets polluted. It highly impact on the human hygiene.
Soil consists of an extraordinary complex chemical mixture of different mineral and organic substances.

The chemical analysis has been developed for their determination. Chemical, physical and biological parameters and behavior of the soil and water qualities are important for agricultural crop. Chemical function of the soil is to store all nutrients. The organic and inorganic material or elements like calcium, magnesium, sodium, potassium, aluminium, phosphorus, chlorine, iron, copper, and manganese etc.brought into solution form and supply to plants[1]. The amount of organic matter present in soil varies considerably. In cultivated soils, it varies from less than one percent to about fifteen percent. This is mainly due to the decomposition of organic matter. It varies with the depth of soil; it is usually more in surface region and gradually less and less in deeper part of the soil. Due to the dynamic character of soil, it makes more productive.

The nitrogen level can be maintained by addition of fertilizers, dung and urine. Some studies have

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found that different stock manures were equivalent to inorganic fertilizer in P, N availability [11, 12].Soil water is one of the parameter to enhance the growth rate of crop; it is from rain, snow, dew or irrigation.

The quantity of available calcium and magnesium increases with rise in pH, hence their availability in alkaline soils. If the pH is above 8.5, the availability of these nutrients again decreases. The available amount of copper decrease as the soil pH increases. Acid soils are formed under natural conditions as well as artificially by the continuous use of various fertilizers and accumulation of organic residue. The acid soil reacts with calcium and other bases to form calcium nitrate. Calcium and magnesium carbonate in varying proportions are present throughout the soil profile.

The aim of the study is to investigate the nature and quality of soil for the agricultural purposes from the Niphad because it is well-irrigated region.
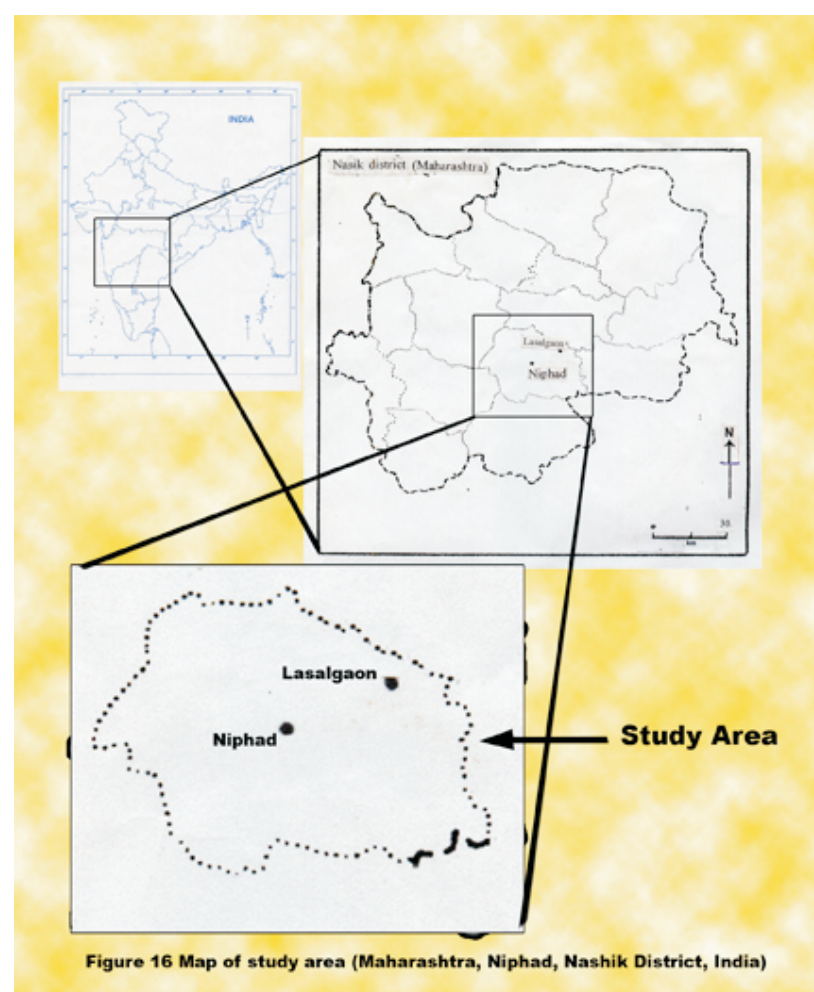
LOCATION MAP

Figure 16 Map of study area (Maharashtra, Niphad, Nashik District, India)

DATA AND METHODOLOGY

Samples were collected from the Niphad taluka (Maharashtra) region (200.4'60" N; 74 0   7' 0"E and 19 0 58' 60 "N; 730 47' 60" E). The average elevation is 569 m (1,867 ft.). The total geographical extent of Nashik district is 200 km east-west and 120 km north-south, wherein the present study area of Niphad has 105300 hectors of land; the land under irrigation was 30482 hectors.

For the present study, sampling had been carried out for two years i.e. from march 2006-2008. Twenty-eight different locations were selected for the study. After the harvest of crop soil samples were collected as the dry soil as that time. Soil auger was used for sampling. The number of samples was collected according to the size field. A thin vertical slice of soil (depth 0-20 cm) was taken [4]. The collected samples are mixed thoroughly in a pail and passed through a course screen. It was divided into four equal parts and opposite parts is discarded. Two opposite portion are mixed thoroughly this procedure was

repeated to get desired quantity of soil; it was labeled with necessary information. The soil samples were partially air dried (not to sticky) at the temperature ranges 250 to 300 C. The soil samples was passed through the 2mm, round sieve and used for the analysis. The surveys were conducted during the study period. Specially designed questionnaire were used to collect the necessary data for achievement of the objectives.

Quantitative analysis of soil parameters such as pH, electrical conductivity (EC), particle density, available nitrogen kg ha-1, and calcium carbonate were determined by following standard methods.

The pH of soil samples were measured by using pH meter MFRS (Toshniwal inst. Mfg. Pvt.Ltd. Ajmer CAT. NO.CL 54). The soil: water ratio of 1:2.5, to a 10 gm soil sample in 50 ml beaker is added a 25 ml volume of distilled water. The suspension is stirred at regular intervals for 20 to 30 minutes on mechanical shaker, then the pH is measured with the glass electrode, the suspension being stirred well just before the electrode is immersed, pH meter was standardized with pH 4 and pH 9 solutions. The pH levels determine the availability of nutrients stored in the soil.

The salt content present in the given soil sample can be estimated by electrical conductance measurement. It is measured with the help of Auto ranging conductivity and TDS meter TCM – 15 (Toshniwal inst. Pvt. Litd.Ajmer with accuracy 0.5%) of full scale. Potassium chloride solution with 1408.8 millimho/cm at 250 C served as standard.

Particle density is the density of solid soil particles only the true measurement does not include water weight or pore. The specific gravity is the ratio of the weight of a substance to the weight of an equal volume of water. It is the soil particles with the pore space known to be particle density; it varies from 2.017 to 2.912.

Available nitrogen from soil measured by alkaline permanganate method .The organic matter from the soil is oxidized by potassium permanganate in presence of sodium hydroxide. Ammonia released during oxidation. This is absorbed in boric acid and converts ammonia into ammonium borate. This ammonium borate solution was titrated with standard H_2SO_4 and from this nitrogen was calculated.

Determination of calcium carbonate from soil was measured by rapid titration method. Soil is treated with excess HCl. Carbon dioxide was evolved in the reaction and collected in standard NaOH solution. It is then back titrated to get adequate results.

RESULT AND DISCUSSION

Most enlightening attributes of soil is pH. The soil acid or basic has to do solubility of various components, ion exchange, and various activities of microorganisms. Certain pH ranges explains specific information. A pH is less than 4 indicate the presence of free acids, associate the sulphides, a pH below 5.5 suggest the exchangeable Al and pH 7.8 to 8.2 shows the presence of calcium carbonate same was found in the studied samples. A soil pH range was found to be 7.21 to 8.50. No any one sample showing below pH 7 value.

The electrical conductance of water extract of soil gives the soluble salts content of soil. The determination of electrical conductivity (EC) is the measuring of electrical resistance between the extract. It increases with increase in temperature. 24 soil sample has found in the EC range of 0.092 to 0.93 values, indicate good quality soil and 4 samples was found poor seed emergence type.

Particle densities were found in the medium range 2.0179 to 2.912 g cm3. These variations in the parameters could be predominantly being due to ecological factors.

Organic carbon: soil organic matter plays an important role in farming soil aggregates. Walkley-Black method is used for their determination. The organic carbon in organic matter from the soil is oxidized by known excess chromic acid. Organic matter does not reduce the excess chromic acid, it is determined by back titration with standard $FeSO_4$ solution using ferroin indicator. The organic carbon in soil is calculated from the volume of chromic acid utilized by it.

Two samples were found high level of percent organic carbon. Five moderately high and nineteen are moderate while one low, one has very low percent of organic carbon. In EC and organic carbon shows random trend, no exact trend was found.

Nitrogen is a unique plant nutrient; plants can absorb nitrogen in either the cationic form (ammonium ion) or the anionic form (nitrate). Nitrate nitrogen was soluble and mobile in soil and easily leached. Nitrate ammonium forms may be consumed by microorganisms or converted to gaseous nitrogen forms and lost to the atmosphere. Available nitrogen of soil contains all ammonical and nitrate nitrogen, (NH_4–N   and NO_3-N) these forms of nitrogen, plants absorbs from the soil. Ammonia formed in the decomposition of organic matter is converted to NO_3.As the nitrate nitrogen is formed from minerals and added nitrogenous fertilizers. In study area the available nitrogen found in the ranges between 211 to 590 kg ha-1 and three samples having low amount, fifteen samples were found to be medium and ten are high. This is due to over use of nitrogenous fertilizers and organic bound nitrogen material. It is need to maintain

medium range for good quality crops. Due to high nitrogen, it enters into waterways hence % N increases in water.

Calcium carbonate: calcarious nature of soil due to carbonate of lime and magnesia. They are sedimentary origin, shells, rocks; the calcarious material was deposited in the form of shells or layers from water containing calcium carbonate in solution. The precipitate is very soft and very soon acquires hard. Carbonate in soil occur in sub-humid region, particularly the ranges were found 2 to 4.99 %. A plot of pH via percent CaCO3, it decreases with decrease in pH. The soils were no high calcarious. Five samples noncalcarious and twenty-three medium calcarious were found.

The study revels that the degree of acidity or alkalinity of soil finds mildly, moderately alkaline i. e. optimum range. EC increases as percent of calcium carbonate increase. High amount of available nitrogen found indicates the over use of nitrogenous fertilizers. 85% farmers used advance technology for farming,95% of farmers use various types of chemical pesticides. The 27.78 percent of farmers were aware about the testing of soil and water.

CONCLUSION

The problem of high soil pH are solved by adding special fertilizers such as water soluble chelates, soluble complexes of metal ions (susceptible to microbial decomposition).Most of soil samples EC were good. The methods used to reduce soil transport processes. It is also need to maintain and improve the health of soil. There is a need for further investigation of soil quality. Farmers were used advanced technology.

ACKNOELEDGEMENT

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