IRJSE International Research Journal of Science & Engineering
Int. Res. J. of Science & Engineering, 2020; Special Issue A7: 664-667 SJIF Impact Factor 6.68
ISSN: 2322-0015
RESEARCH ARTICLE **OPEN ACCESS**

The physico-chemical status of Nagbhid taluka paddy soil district, Chandrapur Maharashtra, India.

Petkar SD*[1],Wadhave NS[2] and Dahegaokar RR[3]

[1]Department of Botany, Anand Niketan College, Warora, Dist. Chandrapur, MS (India)
[2]Department of Botany, N.S.Science and Arts College, Bhadrawati, Dist. Chandrapur, MS (India)
[3]Department of Botany, Dr. Babasaheb Ambedkar College, Chandrapur, Dist. Chandrapur, MS (India)
*Corresponding author : takshusimi@gmail.com

Manuscript Details
Available online on http://www.irjse.in
ISSN: 2322-0015

Cite this article as:
Petkar SD,Wadhave NS and Dahegaokar RR. The physico-chemical status of Nagbhid taluka paddy soil district, Chandrapur Maharashtra, India., *Int. Res. Journal of Science & Engineering,* February, 2020, Special Issue A7 : 664-667.

ABSTRACT
In present investigation physicochemical status of Nagbhid taluka has been studied for the period of two years from feb- 2017 – feb-2019. Nagbhid taluka has an area of 1100 sq km, the area under cultivation is around 51900 hectors. Nagbhid taluka has rice cultivation area of 25803 hectors. Soil samples were collected from Mohadi, Kotgaon, Mousi, Govindpur, Nanded, and Talodi for to study the physico-chemical status of Nagbhid taluka paddy soil.

Keywords: Physicochemical,Paddy soil, E.C., Phosphorus, Potassium, Nitrogen.

INTRODUCTION:

The soil is a living entity not just a substrate in which plants grow. A living soil is teeming with life, from earthworm's centipedes, and beetles to fungi and bacteria. Healthy soil has food, air and water to help plants grow. Most of the plant nourishment comes from the soil. The nutrients are made up of minerals from the earth. Other nutrients come from dead plants and animals also broken down over time by insects and other organisms which lives in the soil. Soil forms slowly but can be lost rapidly through erosion. It can also be contaminated by pollution. Some evidence suggests that using artificial fertilizers actually suppress the rich diversity of life in the soil that is needed to keep it healthy. The success of green revolution depends upon the availability of fertilizers, high yielding variety of seeds; improved agronomical practices and timely availability of water. Soil is a natural resources on whose proper use depends the life support system and socio-economic development of the region.

Maintaining quality of the soil resources base is a key issue in ensuring sustainability of agriculture and fibre security for the people and clearer environment. Our interest in soil has developed primarily from the need to produce food, fibre forest crops and medicines for health.

The most significant discovery was that ofthegrowing plants obtain elements calcium,potassium, sulphur and phosphorus from soil. For the first time he showed that plants obtain their carbon dioxide in air and not from soil [1]. He also established that certain basic principles of sound soil management a cropped soil is restored to fertility only beading to it all minerals and nitrogen removed by the plant; and the law of minimum in relation to mineral nutrition.

Soil is one of the great valuable natural resources of a country. To encounter the growing demand of food, fibre,fuel, it is essential to maintain an excellent state of soil health. Maintaining soil productivity is a major challenge before this generation. Nearly 50% of the land in India suffers varying types and degree of soil degradation. The current rate of soil degradation is 5-7 m ha/yr. and this figure towards an increasing trend [2].

In recent year public attention has been focused increasingly on environmental pollution and its effect on man and other creatures. One of the oldest method of sewage treatments is agricultural disposal, which is still employed to a limited extent today. By this means either sewage or mechanically or biologically treated sewage is brought into contact with the soil with aid of infiltration or surface irrigation system. Soil dressing with sewage or sewage sludge may accordingly have both positive and negative effects. Positive effects are associated with the fertilizing action of certain constituents such as phosphorus, nitrogen in the sewage or sewage sludge. Sewage sludge application must however ensure uniform distribution of well homogenized material that result in uniform height of growth and simultaneous ripening of cereal crops. So, that mechanical harvesting is not impeded.

Agriculture can provide for the food needs of a world population projected to exceed 7.5 billion by the year 2020? There are indications that the highly productive fertilizer and seed technologies introduced over the past three decades may be reaching a point of diminishing returns. [3, 4] Consequently keeping pace with plants growth and increasing land scarcity will be more difficult than in the recent past.

The soil is a complex organization being made up of some six constituent's namely inorganic matter, organic matter, soil organism, soil moisture, and soil solution and soil air. Roughly, the soil contains 50-60% mineral matter, 25-25% air and little percentage of organic matter.Paddy is the main crop of Nagbhid taluka. Farmers used excess amount of chemical fertilizers, insecticides and pesticides hence the soil status becoming imbalance and soil become more polluted. So it is the need of the time that we have to study the Physico-Chemical parameters of soil.

MATERIALS AND METHODS:

SOIL SAMPLE COLLECTION

Soil samples were collected from various sites of Nagbhid Taluka. The selected sites were,

Mohadi	Soil Sample A
Kotgaon	Soil Sample B
Mousi	Soil Sample C
Govindpur	Soil Sample D
Nanded	Soil Sample E
Talodi	Soil Sample F

PROCEDURE

In a composite sample, small portion of soil was collected depth of 15 to 20 cm by means of stainless steel from 15 to 20 well distributed spots, moving in zig- zag manner from each individual sampling site after scrapping off the surface litter, if any, without removing soil. Soil collected from entire area of same site was mixed thoroughly by hand on a clean piece of cloth. About 500 g of soil was sided by quartering process in which entire soil was spread; divided into four quarters two opposite one are discarded and remaining two were remixed. This is repeated; up to about 500 g soil was left. Discarded soil was used for other experiments. Both part of soil samples were stored in polythene bags labelled with necessary information of field.

Preparation of soil samples

Before analysing it is necessary to prepare the sample in proper way.

Procedure

Soil samples were air dried in shade. Soil clouds were lightly ground with the help of wooden pestle and mortar. Entire quantity of soil was sieved through 2 mm stainless steel sieve and then remixed.

RESULTS AND DISSCUSSION

Physico-Chemical parameters of soil samples

Colour : Colour of soil samples A,B,C,D and F were blackish brown and E reddish in colour.

pH : Soil samples A,B,C,D,E,F, have the pH 7.4,7.6,7.9,7.3,7.8 and 7.5 respectively.

Electrical conductivity : soil samples A,B,C,D,E,F have the E.C O 0.4,0.3,0.4,0.4,0.3 and 0.5 respectively.

Nitrogen : Soil samples A,B,C,D,E,F have the kg/h nitrogen 112,116,113,113,111 and 109 respectively.

Phosphorous : Soil samples A,B,C,D,E,F have the kg/h phosphorous 11.5,10.6,10.6,10.9,11.6 and 10.5respectively.

Potassium : Soil samples A,B,C,D,E,F have the kg/h potassium 270,271,263,281,262 and 234 respectively.

Nutrients content in the soil is available to plants only in small fraction at a given time. Therefore, reliable soil fertility index is determines by soil testing. Soil testing needs in determination of such requirements, which help in balanced fertilization for future to avoid deficiency/toxicity of different plant nutrients and helpful to microbial population. Many workers studies the content of soil in various regions for different reasons.yhe experiments performed on the different soils accordingly to their properties.

Soil colour : Soil colour in the Nagbhid area varies from reddish to blackish.

pH:

The pH range of soil is between 7.3 to 7.7indicating an alkaline nature of soil. Variation in the pH of the soil may be due to phosphorus level of soil. The pH greatly affects solubility of minerals and other parameters also. The highest pH was recorded in soil E and lowest pH in soil D. It is similar with result [5]. Soil at Pune was slightly alkaline in reaction having pH 8.2 [6]. It is similar with the result of [7] reported the soil of Madhya Pradesh, sehore was 7.2.It is also similar with [8] reported the pH of the soil Kadi Taluka of north Gujrat is in between 7.4 to 7.9.

Electrical conductivity:

The E.C. values range from 0.3 to 0.5. The measurement of EC gives the concentration of soluble salts in the soil at any particular temperature. The variation in EC is due to higher concentration of ions in solution and is directly related to soluble salt concentration. The highest value of EC was recorded in soil E and lowest was in soil F. It is similar with [9] reported soil padgon soil and had EC of 0.5 dsm. EC values range from 0.3 to 0.6 mS/cm (Normal EC ranges from 0.02 to 2.0 mS/cm) and such soil is said to be non saline.

Nitrogen:

Nitrogen is a part of all living cells and is also necessary part of all proteins, enzymes and metabolic processes involved in the synthesis and transfer of energy. Nitrogen is a part of chlorophyll; the green pigment of the plant is responsible for photosynthesis

Table 2 Physico- Chemical parameters of soil samples

Parameters	Soil A	Soil B	Soil C	Soil D	Soil E	Soil F
Colour	Blackish brown	Blackish brown	Black	Blackish brown	Reddish	Blackish brown
pH	7.4	7.6	7.7	7.3	7.8	7.5
EC mS/cm	0.4	0.3	0.4	0.4	0.3	0.5
Nitrogen (Kg/h)	112	116	113	113	111	109
Phosphorus (Kg/h)	11.5	10.6	10.6	10.9	11.6	10.5
Potassium (Kg/h)	270	271	263	281	262	234

It helps the plants for rapid growth, increasing seed and fruit production and improving the quality of leaf and forage crops. In the present investigation nitrogen value is in the range of 109 to 116 kg/h . It was maximum in soil B and minimum in soil F. These results are similar with the result of [10] who recorded maximum value 594 kg/h.

Phosphorous:

Phosphorous is an essential part of the process of photosynthesis. It involved in the formation of all oils, sugar, starches, etc. It helps in the transformation of solar energy into chemical energy; proper plant maturation; withstanding stress, effects rapid growth, encourages blooming and root growth. Phosphorous is one of the major elements of soil. It is available to plants in the form of phosphate ions (H_2PO_4 & HPO_{4-}). In the present investigation, value of phosphorous range from 10.5 to 11.6 kg/h. the maximum value is found in soil E and minimum in soil F. It is similar with results of [11]. high phosphate in level of rhizosphere shows inhibition of growth. Similar kind of results was noted by [12]] who recorded the value of phosphorous 14.2 Kg/ha. Similar kind of results was noted by [8] who recorded the value of phosphorus is in between 7.77 to 23.31 kg/ha.

Potassium:

Potassium is absorbed by plants in larger amount than any other mineral element except nitrogen and in some cases,calcium. Potassium helps plants in the building of protein, photosynthesis, fruit quality and reduction of diseases. Potassium in the soil is calculated as the amount of non exchangeable or fixed form in soil. In present investigation values of potassium in soil ranges from 234 to 281 kg/h. It was maximum in soil D and minimum in soil F.It is similar with the result of [8] who reported the maximum value of the potassium is 243.04 kg/ha.

CONCLUSION

Conservation of natural resources and sustainable agriculture pattern is based on self-innovated local governance based and equality in the distribution of resources, combined responsibility to protect, preserve and conserve resources for future generation. Mendha-Lekha village is an ideal village where each individual born has access to natural resource with a deep rooted sense of ethics of conservation of natural resources through Gramsabha.

Conflicts of interest: The authors stated that no conflicts of interest.

REFERENCES

1. Liebig J.Von (1840). Chemistry in its application to agriculture and physiology. Report to the British Association.
2. Sehagal, J.L., Sexena R.K. and Pofali, R.M. (1990). Degraded soils, their mapping though soil surveys.
3. Cassman K.G,S.K.De Datta, D.C.OLK,J. Alcantra, M.Samson, J. Descalsota andM. Dizon(1995). Yield decline and the nitrogen economy of laong term experiments on continuous, irrigared rice systems in the rropics. In soil managemen; Experimenal basis for sustainability and envirommental quality . Ed . R. Lal and B. Stewart Boca Raton, Fla USA CRC press.
4. Flinn JC and De Datta SK (1984).Trends in irrigated rice yields under intensive cropping at Philippine research stations. Field Crops Res 9:1-15.
5. Zaidi A. Khan M. S. and Amil M.(1999),Interactive effect of rhizophytec microorganism on yield and nutrient uptake of chickpea [Cicer arietinum L,}, Eur. J. Agron. 19:15-21.
6. Jadhav, A.S., Shikh, A.A., Shinde, A.A. and Harinarayana, G., (1990). Effect of growth hormones, biofertilisers and micronutrients on th yield of Pearl millet. J. Mharashtra Agri. Univ.15(2):pp161-195.
7. Dubey, S.K. (1998). Response of Soyabean (Glycine max) to biofertilizers with and without nitrogen. Phosphorus and potassium on swell- shrink soil. ind.J. of Agron.(3); 546-549
8. Chandak et.al (2017) Analysis of soil samples for its physico-chemical parameters from Kadi city Vol : 03 page 36-40
9. Shinde, D. B. Patil , P. L. and Khande K. K. (1996). A study on sulphur biofertilization of greengram for yield and quality. J. Maha. Agric Univ. 21[3],365-367.
10. Sambandan, K. khanna K. and Raman N. (1980). Distribution of VAM fungi in heavyh metal polluted soils of Tamilnadu Environ Biol. 13;159-167
11. Shobha and Chandrashekhar k. R. (2004). Arbuscular mycorrhizal fungal association of cow pea grown. mycorrhiza News. 19[1]131-134.
12. Prasad, M. ande Prasad, R. (1994). Response of upland cotton (Gossypium hisutum) To biotretilization. Indian. J. Agron.39 (4) ; pp707-708.