INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN:2277-7881; IMPACT FACTOR :6.514(2020); IC VALUE:5.16; ISI VALUE:2.286
Peer Reviewed and Refereed Journal :VOLUME:9, ISSUE:9(5), SEPTEMBER :2020

PHYSICO-CHEMICAL ANALYSIS OF AGRICULTURAL SOIL FROM DEFFERENT AREAS OF BAZPUR REGION IN UDHAM SINGH NAGAR-UTTARAKHAND

Prem Prakash Tripathi
Department of Chemistry
SBS Govt. PG College- Rudrapur, Udham Singh Nagar, Uttarakhand

Abstract

The fertility of soil depends on the concentration of nitrogen, phosphorous, potassium, organic and inorganic material, conductivity etc. The physico-chemical properties are required for the growth of plants. The tehsil Bazpur in Udham Singh Nagar,Uttarakha is well known for agricultural farm land for both crops Rabi and Khariff. The stu were carried out for four village sites 1,2,3 and 4 in different directions. The essentia. parameter pH, electrical conductivity (EC), organic carbon (OC), Sulpher (S), Zinc (Zn), Boron (B), Phosphors (P), Nitrogen (N) etc, were measured with nutrients and micronutrients of farmland. The obtain result are suggested for better fertility in the Bazpur region. Some village sites are rich nutrients and micro nutrients, some are deficient. The deficiency can be overcome by using fertilizers.

Keywords: Physio-chemical analysis, soil, Bazpur, nutrients, micronutrients.

1. Introduction:

Soil is completely weathered, fine particles, loose and friable, high nitrogen, nutrients are available and fertile. There are two basic concepts of soil. The first pedology consider soil as a natural entity, a bio chemically weathered and synthesised product of nature. Certain aspects, such as the origin of soil, its classification and its description are involved in pedology. The second is edaphology conceives of the soil as natural habitat for plants. Edaphology is the study of soil from the stand point of the higher plants. It consider various properties of soil as they relate to plant growth and production. The upper most loose layer of earth suitable for plant growth. The soil reaction and plant growth are interrelated, the reaction effects the nutrient of soil (Sahi, 2011). The crop yield in region were rainfall is adequate are determine more by soil nitrogen than by other minerals elements supplied by soil (Allison, 1957). Phosphorous plays a critical role in energy reactions in plants. The deficiency can influence essentially all energy requiring process in the plant metabolism. Phosphorous stress early in growing season can restrict crop growth which can carry through the reduce final crop yield. Deficiencies during early growth generally have a great negative influence on crop productivity, the phosphorous restrictions imposed latter in growth (Grant, Faltan, Tomasiewicz& Sheppard, 2001). In most developing countries including Nigeria, fertilizers are applied to soil by uneducated farmers without particularly making reference to the specific need of the plants of soil. The soil fertility

was evaluated with the symptoms, visual, plant tissue and soil testing in terms of predicting fertilizer equipment for crop in Nigeria (Soil Fertility Evaluation, 2012). The variation in altitude and climate differ natural advantage for crop diversification. As such alternative strategies related enterprises viz horticultural, forestry, floriculture, medicinal plant need to strengthened. Besides, less numerative crops can be replaced with more profitable crops on rotational basis (Tuteja, 2013).

Bazpur is a Tehsil in Udam Singh Nagar district in the state of Uttarakhand, India with cordiantes 29.17^0 N, 79.16^0E. Hindi, Punjabi, Bangali and Kumauni are main languages. It is an affluent town mainly due to large agricultural estates. It is the part of Tarai region (Bazpur-Wikipedia). Agriculture is the primary occupation of people as it justify the name 'Chawal Ki Nagari'. Khariff and Rabi are two major cropping season. The main Khariff crops are Rice, Soyabean, Urd, Moong and Til, and Rabi crops are wheat barley, gram, Masur, Mustard, Sunflower in Udham Singh Nagar (Udham Singh Nagar at a Glance). The monitoring of soil quality can improve the fertility of farm land in Bazpur.

2. Literature Review:

The elemental and nutritional values of any farmland after physio-chemical examination can improve the fertility (Sahi, 2011). The soil sample obtained from motor vehicle repair station at Rishikesh Uttarakhand are highly contaminated with polycyclic aromatic hydrocarbon (PAHs) and bioremediation is suggested by using microbes (Bahuguna, Lily, Munjal, Singh &Dangwal, 2011). From the study covering the advent of spring and early summer months, it is easily conceivable from the result that sal forested soil in this region does not show any deficiency of plant nutrients. The undistributed side had greater production, higher decay rate and higher population of bacteria and fungi, all have contributed to the nutrient enrichment in soil (Sharma, Arunchalam&Arunchalam, 2017). The chemical characteristic of soil vary from place to place, slightly alkaline to acidic while highest amount of organic carbon is recorded from valley plane and decreasing towards valley bottom. It is probably due to accumulation of humus from the top of the hills to valley plain caused by surfaced runoff. The study reveals that the land forms and soil development in area is governed by weathering, erosion and the deposition by both fluvial and gravitational process (Sharma & Joshi, 2018).

The soil and topography are not suitable for monocropping mixed agricultural practices need to be updated. The diversify agricultural would be healthy mixed of animal husbandry including cattle rearing, poultry, fishing, bee keeping extra. There is urgent need to improve productivity of crops and livestock. It is also important to introduce organic farming practices to enrich soil and increase soil depth for sustained development of agriculture in the long run in Uttarakhand (Singh, 2017). The mean content of non sulphur was maximum in high Sulphur category followed by low and medium sulphur soil (Singh, Singh, Srivastava & Singh, 2009).In the plant physiological investigation the research is vital foundation of the great fertilizer

industry, agricultural experiment stations are lending important aid but they have many fold demand on their resources (Hoagland, 1931).Organic agricultural system should included which begins to consider potential environmental and social impacts by eliminating the use of synthetic fertilizer, pesticides etc. The camps, rally and training program for the farmers should be arranged for increasing awareness regarding the benefit of organic agriculture, bio fertilizer etc. In crop production and these by improving soil fertility and nutrients status (Deshmukh, 2012).The land degradation process is generally divided in three classes, i. physical degradation, ii. biological degradation, iii. chemical degradation. The physical and chemical properties are deteriorated due to soil desurfacing. All the major nutrients needed for plant growth have decease significantly in desurfaced soil as compared normal soil. Organic matter, which is considered the reservoir of all nutrients has depleted more than fifty percent in desurfaced soil (Singh, Devi &Hooda, 2015). The strength characteristics of soil are affected expensively due to change in soil's internal structure and mineralogy. The data obtained during the experiment is an indication that alteration in soil properties due t pollutants must be assessed for drawing safe design criteria for upcoming civ engineering structure along Yamuna riverbed (Mandal, Vyash, Chandra, Ankur & Yadav, 2015)

3. Methodology:

The soil samples collected from soil surface of different village sites from farmland of Bazpur. The main center point was Bazpur bus stop. The four village sites considered for samples in different locations as mentioned in below the table.

Table 1: Selected Village Sites.

Sr.No.	Direction	Name of Village and code	Longitude	Latitude
Site 1	North	Barhani Mauna (BRMABPUR)	29.1176^0	79.1743^0
Site 2	South	Chakarpur (CHAKBPUR)	29.1356^0	79.1468^0
Site 3	East	Barwala (BRWLBPUR)	29.1066^0	79.1852^0
Site 4	West	Narkota (NRKTBPUR)	29.1752^0	79.1376^0

All samples were collected and dried under shade and analysed at Regional Soil Testing Rudrapur (Udham Singh Nagar) with help of these available instruments in there laboratory. The instruments are pH Meter- pH determination, Electrical Conductivity Meter- EC determination, Colorimeter- Phosphate, Boron determination, Flame Photometer- Potash determination, Atomic Absorption Spectrophotometer (AAS)- Micronutrient determination, Spectrophotometer- Sulphur determination, Organic Carbon - Titration methods.

4. Result and Discussion

The obtain results are summurized below these tables.

TABLE:2 Site -1 Barhani Mauna (BRMABPUR)

S. No.	Parameters	Result	Unit	Evaluation
1	Ph	7.9		Normal
2	Electrical Conductor (EC)	1.07		Normal
3	Organic Carbon (OC)	0.88	%	High
4	Phosphorous	9.0	Kg/h	Low
5	Potassium	93	Kg/h	Low
6	Sulphur	10.48	ppm	Normal
7	Zinc	1.42	ppm	Low
8	Boron	0.18	ppm	Low
9	Iron	115.9	ppm	Normal
10	Manganese	5.49	ppm	Normal
11	Copper	1.682	ppm	Normal

TABLE :3 Site -2 Chakarpur (CHAKBPUR)

	Parameters	Result	Unit	Evaluation
1	Ph	8.0		Normal
2	Electrical Conductor (EC)	0.91		Normal
3	Organic Carbon (OC)	0.40	%	Low
4	Phosphorous	4.5	Kg/h	Low
5	Potassium	107	Kg/h	Low
6	Sulphur	9.34	ppm	Low
7	Zinc	0.78	ppm	Low
8	Boron	0.91	ppm	Low
9	Iron	63.70	ppm	Normal
10	Manganese	0.78	ppm	Low
11	Copper	1.35	ppm	Normal

TABLE :4 Site -3 Barwala (BRWLBPUR)

S. No.	Parameters	Result	Unit	Evaluation
1	Ph	8.0		Normal
2	Electrical Conductor (EC)	0.95		Normal
3	Organic Carbon (OC)	0.61	%	Medium
4	Phosphorous	9.0	Kg/h	Low
5	Potassium	135	Kg/h	Medium
6	Sulphur	10.14	ppm	Normal
7	Zinc	0.42	ppm	Low
8	Boron	0.45	ppm	Low
9	Iron	37.76	ppm	Medium
10	Manganese	1.906	ppm	Normal
11	Copper	1.354	ppm	Normal

95

TABLE : 5 Site -4 Narkota (NRKTBPUR)

S. No.	Parameters	Result	Unit	Evaluation
1	Ph	7.8		Normal
2	Electrical Conductor (EC)	1.10		Normal
3	Organic Carbon (OC)	0.59	%	Medium
4	Phosphorous	36.0	Kg/h	High
5	Potassium	82	Kg/h	Low
6	Sulphur	11.21	ppm	Normal
7	Zinc	1.731	ppm	Low
8	Boron	0.41	ppm	Low
9	Iron	30.92	ppm	Normal
10	Manganese	4.590	ppm	Low
11	Copper	1.68	ppm	Normal

5. Conclusion

The various results obtained from soil analysis reveals that the some village sites are deficient for organic carbon, phosphorous, potassium while some village sites are enriched with higher values. Variations in iron, magnesium boron, copper, sulphur has been also observed in different sites. To improve the fertility of Bazpur soil farmland

can be maintained by using fertilizers and bio fertilizers. The recommendations obtained from regional soil testing laboratory are composed in the table- 6.

TABLE :6 Recommendation of Fertilizer

Site	Diammonium Phosphate (DAP)	Urea	Mutrate of Potash (MoP)	Zinc Sulphate ($ZnSO_4$)	Borax	Manganese Sulphate ($MgSO_4$)	Compost
Site 1	67.8 kg/hect.	64.8 kg/hect.	34.7 kg/hect.	-	2-4 kg/hect.	-	-
Site 2	67.8 kg/hect.	143kg/hect.	34.7 kg/hect.	-	2-4 kg/hect.	56-112 kg/hect	40 qtl./hect.
Site 3	67.8 kg/hect.	103.9 kg/hect.	26.7 kg/hect.	6-10 kg/hect.	2-10 kg/hect	-	40 qtl./hect.
Site 4	36.5 kg/hect.	116.3 kg/hect.	34.7 kg/hect.	-	2.4 kg/hect	-	28 qtl./hect.

6. Acknowledgement

The author is very thankful to Dr. Mohd. Tahir Assistant Director, Retd. Sri. H. Chandra Sati Agriculture Officer of Regional Soil Testing Laboratory Rudrapur for providing the Lab facility.

7. References:

1. Sahi, V.N.(2011). Fundamentals of Soil and Soil Components, Kalyani Publishers New Delhi, 4th Edition, pp:01-04, 120-135.
2. Allison, F.E.(1957). Year Book of Agriculture, pp: 85-94.
3. Grant, C.A, Flaten D.N., Tomasiewicz, D.J. & Sheppard, S.C. (2001). The importance of early season phosphorous nutrition. *Cand. J., Plant, SCI. Vol. 81, pp: 211-224.*
4. Soil Fertility Evaluation: A potential tool for predicting fertilizer requirement for crops in Nigeria. *African Journal of Agricultural Research, Vol. 7(47), pp: 6204-6214*
5. Tuteja, U. (2013). Agriculture Profile of Uttrakhand, *Agricultural Economics Research Center, University of Delhi.*
6. Bazpur- Wikipedia
7. www.cgwb.gov.in - Udham Singh Nagar at a Glance.
8. Bahuguna, A., Lily, M.K., Munjal, A., Singh, R.N. &Dangwal, K.(2011). A study on physio- chemical analysis of automobile contaminated soil of Uttarakhand, India, *International Journal of Environmental Sciences, Vol. 2(2), pp: 392-400.*
9. Sharma, S.,Arunchalam, K.&Arunchalam, A.(2017). Soil characteristic in the distributed and undistributed plots of Sal forest in Shivalik of Indian Himaliyan Region. *Indian Journal of Hill farming, Vol. 30(2), pp: 176-180.*
10. Sharma, M. & Joshi, R.C.(2018). Physio- chemical characteristic in BhimtalGadhera catch bend Kumaun Himalaya, Uttarakhand. *Journal of Emerging Technologies and Innovative Research, Vol. 5(7), pp : 729-736.*

11. Singh, P.B (2017) Changing trends of Agricultural Development and its effects on environment of Uttarakhand Hills. *Scholarly Research Journal Interdisplinary Studies. Vol. 4(37), pp: 8608-8621.*
12. Singh, S.P., Singh,R., Srivastava, P.C., & Singh, P.(2009).Different forms of sulphure in soil of Udham Singh Nagar, Uttarakhand and their relationship with soil properties. *Agropedology, Vol. 19(1), pp: 68-74*
13. Hoagland, D.R. (1931). Absortion of mineral elements by plants in relation to soil problems. *Plant Physiology, Vol. 6(3), pp: 373-388*
14. Deshmukh, K.K.(2012). Evaluation of soil fertility status from Sangamener area, Ahmad Nagar Distt. Maharashtra, India. RasayanJ.Chem. Vol. 5(3), pp: 398-406.
15. Singh, P., Devi, R. &Hoda, R.S.(2015). Impact of soil desurfacing on phsio-chemical properties of soil of the study area in Haryana. International Journal of MultidisplinaryReaserch and Development. Vol.2(7), pp:560-566.
16. Mandal, K., Vyas, S., Chandra, C., Ankur & Yadav, J.(2015). Assessment of physio-chemical properties of Contaminated soil samples from Yamuna Riverbed. D.U Journal of undergraduate research and innovation. Vol. 3(1), pp: 39-48.