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Chemical analysis of the Triticum aestivum Cropped Soil

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Abstract

Triticum aestivum commonly known as wheat. Simple random sampling method was used for collection of samples from twenty different locality of Tarakhola Rural Municipality-1, Majhakharka. The chemical compositions (NPK, Zn, B, and organic matter), EC and pH of Tarakhola Rural Municipality had been investigated. The micronutrients (Zinc and Boron) were determined by using Spectrophotometer and Colorimetric method. Nitrogen, Phosphorous and Potassium were analyzed by Kjeldahal method, Flame Photometer method, Modified Olsen's bicarbonate method respectively. Organic matter was determined by Calorimeter. Nitrogen- 0.57% , Phosphorus-29.05 ppm (65.08kg/hector), Potash-159.68 ppm (357.69kg/hector), organic matter-3.57%. pH is 6.4. which is suitable pH for wheat crop, Electrical conductivity is 0.087ds/m (87 milisimen), Zinc-0.54 ppm ,Boron is 0.01 ppm. Organic matter and Nitrogen were medium but P and K were maximum and Zn and B were minimum.

Key words: pH, Macronutrients and Micronutrients, Soil electrical conductivity,

Introduction

Soil is a natural resource that can be found on the earth's surface. Understanding how soils are created, categorized, and mapped as well as their physical, chemical, biological, and fertile characteristics and how these elements affect how they are utilized and managed are the main objectives of soil study. Maintaining soil and arable land is challenging in a world with a growing population, a persistent water shortage, an increase in the amount of food required per person, and land degradation.

Soil chemistry deals with the study of both inorganic and organic compounds. Soil chemistry, which generally concentrates on how pollution and nutritional vitamins engage with soils, bills for the chemical interactions and things to do with various components. Scientists are aware of environmental pollutants, counting off their acts as well as taking action to reduce them. The study combining effects due to the chemicals can help to understand the relationship with earth science, physics, and biology which is integral for the study, prevention, and administration of onmental troubles associated with soil. Soil Science has six well-defined disciplines Soil chemistry deals with the study of both inorganic and organic compounds. chemistry, which generally concentrates on how pollution and nutritional vitamins engage with soils, bills for the chemical interactions and things to do with various components. Scientists are aware of environmental pollutants, counting their effects as well as taking action to reduce them. The study of combining effects due to the chemicals can help to understand the relationship with earth science, physics, and biology which is integral for the study, prevention, and administration of environmental troubles associated with soil (Biswas & Mukherjee, 1985).

Metal Elements in Soils

Metal Elements in Soils Table 2 lists the average crustal and soil concentrations of 27 metals and three metalloids (Si, As, and Sb) along with their anthropogenic mobilization factors.z The value of Mass extracted annually by mining and fossil fuel production (AMF) is calculated as the mass of an element extracted annually, through mining operations and fossil fuel production, divided by the mass released annually through crustal weathering process and volcanic activity, with both figures being both on data obtained worldwide.

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If AMF is well above 10, an element is said to have significant anthropogenic perturbation of its global biogeochemical cycle. A glance along the fourth and eighth columns in Table 2 reveals that, according to this criterion, the transition metals Cr, Ni, Cu, Zn, Mo, and Sn the "heavy metals" Ag, Cd, Hg, and Pb; and the metalloids As and Sb have significantly perturbed biogeochemical cycles. Not surprisingly, these 12 elements also figure importantly in environmental regulations. (Sposito, 2008).

Composition of Soil and Sediment

Soil is a precious natural resource that affects our ecosystems in numerous ways and therefore is an integral component of life on Earth. Soil is responsible for nutrient cycling, plant growth, gas exchange, carbon storage, and waste disposal. Soil consists of a mixture of weathered or eroded rocks, nutrients, living organisms, organic matter, water, and air. A soil in optimum condition contains approximately 45% solid material, 5% organic matter, and 50% pore spaces, which are occupied by an equal proportion of water and air. Soil formation is remarkably a slow process. It takes several hundred years for a centimetre of topsoil to form. This formation occurs through rock weathering and sediment deposition (Kalev et al, 2017).

Micronutrients and Macronutrients

Plants prefer several micronutrients contained in soil, but only in very little levels. Micronutrients make up seven of the required 17 components. Mn, Fe, Cu, Zn, Mo, and Cl in Harmensen and Vlek (1985) studied for a plant to be resilient ample to face up to the cruelest conditions, the three macronutrients nitrogen, phosphorus, and potassium must be exactly balanced in the soil. The precise macronutrient ratio a plant requires to continue to exist is unknown. The pinnacle three groups are frequently N, P, and K. The distribution of macronutrients in the soil can be altered, which permits the adjustment of a range of variables that have an impact on the health and boom of vegetation. Chemically, the three sources are made up of a combination of nitrogen, phosphorus, and potassium.

Soil electrical conductivity (EC)

Several chemical and physiological factors have a strong correlation with the level of tangential electrical conductivity of the soil. The electrical conductivity of a substance can be used to detect electrical issues (transmitted). The resource for equipment classification that is highly recommended enables unique milli Siemens per meter (mS/m) pricing allocations. Deci Siemens per meter (dS/m), which is 100 times more environmentally benign than milli Siemens per meter, is used to assess electrical conductivity (Barbosa & Overstree, 2001).

Triticum aestivum, also known as bread wheat. It is an annual plant belonging to the family Poaceae. It can grow temperature ranges from 4.9 to 27.80 degree Celsius, pH ranges from 4.5 to 8.3, and it has been tailored to a wide range of climatic conditions (Duke, 1983).

Table 1

Mean Content (Measuring Milligram Per Kilogram) Of Nonmetal Elements in Crustal Rocks and United States Soils (Wedepohl 1995 And Schaclesse Et Al, 1984)

S.N.	Elements	Crust	Soil
1.	B	17	26
2.	C	1990	16,000
3.	N	60	2000
4.	O	472,000	490,000
5.	P	757	260
6.	S	697	1200
7.	Cl	472	100
8.	Se	0.12	0.26

Table 2

Mean Content (measuring milligram per kilogram) of Metal and Metalloids Elements and their Anthropogenic Mobilization Factors (Klee and Gradel, 2004)

S.N.	Element	Crust	Soil	AMF
l.	Li	18	20	3
2	Be	2.4	0.6	2
3	Na	23600	5900	2
4	Mg	22000	4400	<1
5	Al	79600	4700	<1
6	Si	288000	310000	<1
7	K	21400	15000	<1
8	Ca	38500	9200	2
9	Ti	4010	2400	1
10	V	98	58	14
11	Cr	126	37	273
12	Mn	716	330	10
13	Fe	43200	18000	16
14	Co	24	7	4
15	Ni	56	13	56
16	Cu	25	17	632
17	Zn	65	48	115
18	As	1.7	5.2	27
19	Sr	333	120	3
20	Zr	203	180	4
21	Mo	1.1	0.6	80
22	Ag	0.07	0.05	185
23	Cd	0.1	0.2	112
24	Sn	23	0.9	65
25	Sb	0.3	0.5	246
26	Cs	3.4	4	12
27	Ba	584	440	4
28	Hg	0.04	0.06	342
29	Pb	14.8	16	27
30	U	1.7	2.3	12

The primary factors C, N, P, and S are additional macronutrients that are implied that they are fed on in vast quantities via organisms and are indispensable to their existence cycles. Because of the big anthropogenic effect these factors survive, the international biogeochemical cycles of these factors are hence of principal interest. As an illustration, the annual emissions from mining and fossil gasoline extraction are extra than a thousand instances greater in phrases of C and N, one hundred instances greater in phrases of S, and ten instances extra in phrases of P than the international emissions from crustal weathering processes. These 4 components endure organic and chemical transformation in soils earlier than being launched into the nearby atmosphere, biosphere, and hydrosphere.

Most of the soils of the research area were found to be moderately acidic with the pH range of 5.4-6.7, and a mean pH of 6.04 was obtained. Thus, Farmers should be encouraged to test their soil health regularly for correcting micronutrient deficiencies and other soil health problems for sustainable integrating farming systems in the area. Since the balanced application of fertilizers is essential to avoid crop yield decline and to supplement nutrient losses from the soils. Therefore, everyday soil checking out and monitoring of fertility repute of each fundamental vitamins like N, P, and K as nicely as micro-nutrients are integral for reaching sustainable agriculture; this exercise would make certain excessive productiveness in accordance with nutrient demand by means of plants and would additionally be environmentally friendly (Dhakal, 2012 & Hoeft , 2004).

We observe that soil fertility mining is causing an alarming pace of soil fertility decline in eastern Africa. Because a significant section of the soils in the region are heavily worn and have limited macronutrient reserves to enable nutrient mining, this puts crop production on an unsustainable path. The existing methods used by small farmers to control soil fertility, such as biomass transfer, short fallow periods, and other organic techniques, seem insufficient to stop nutrient outflows. As a result, numerous case studies have demonstrated that crop yields are decreasing. The region's declining soil fertility trend is a significant challenge for policymakers given the growing population (Bekunda et al, 2002).

Table 3

Soil Fertility Status (Ar slid and Akram, 1999)

S. N	Organic Matter%	N%	P(ppm)	K(Meq/1)	CEC(Meq/100g)	pH
1	0.37	0.16	0.07	0.02	7.84	8.78
2	0.93	0.16	0.21	0.1	8.9	8.62
3	0.47	0.06	0.27	0.35	13.26	8.7
4	1.11	0.02	2	0.15	14.08	9
5	1.84	0.04	0.27	0.2	17.06	8
6	0.87	0.07	2.5	0.1	12.53	8.4
7	1.22	0.07	0.27	0.15	7.8	8.41
8	1.38	0.01	2	0.4	15.09	8.9
9	1.28	0.06	0.27	0.2	7.5	8
10	1.01	0.02	2	0.35	7	8.2
11	0.93	0.2	4	0.25	5.5	8.3
12	2.17	0.04	3	0.3	15.02	8.04
13	1.84	0.04	0.17	14.4	22.59	10.24
14	2.48	0.07	0.32	0.4	7.27	8.16
15	1.76	0.08	3.5	0.15	15.55	8.1
16	1.13	0.06	3.2	0.35	15.06	8.11
17	1.18	0.06	2	0.2	17.04	7.99
18	1.34	0.09	3	0.1	27.61	8.3
19	0.93	0.07	0.4	0.5	13.54	8.37
20	1.38	0.07	0.3	0.3	17.58	8.3
21	0.78	0.05	4	0.45	14.54	8.4
22	1.45	0.1	0.37	0.15	20.77	8.27
23	1.3	0.09	4.68	4.8	16.05	8.59

Table 4

Composition Nitrogen, Phosphorus, Potash and Organic Matter in Wheat Cropped Soil

S. N.	Nitrogen (%)	Phosphorus(ppm)	Potash (ppm)	Organic matter (%)
1.	0.17	29.05	159.68	3.57

Table 5

Manual for Soil and Fertilizer Analysis (2074-075)

Element	Low	Medium	High
Nitrogen	< 0.1 %	0.1- 0.3 %	>0.3 %
Phosphorus	< 31 kg/ ha	31- 55 kg/ ha	>55 kg/ ha
Potash	<100 kg/ha	110- 280 kg/ha	>280 kg/ha

The result was compared with different statistics

Table 6

*Some Physical and Chemical Parameters of Soil of Khet and Bari Land (*Regmi And Zoebisch, 2004)

Soil Parameter	Khet	Bari
Nitrogen,%	0.13	0.14
Phosphorous, Kg/ha	14.38	54.53
Potash, kg/ha	305.86	648.90
Organic Matter,%	2.09	2.70
pH	5.20	5.57
Bulk density, gm/cm^3	1.36	1.28
Rooting depth, cm	59.69	55.19

The pH varies of 5.5 to 7.5 in the soil letting in for the launch of nitrogen from natural materials, and this vary has a particularly considerable impact on some fertilizers. Plant vitamins break out from soils with pH values beneath 5.0 and radically change appreciably greater shortly into soils between 5.0 and 7.5. The pH varies from 5.5 to 6.5 is commonly the place flowers may additionally be nourished most easily. A few kinds of soil with a pH under 5.0 might also make aluminium dangerous for plant growth. Clay-specifically, the pH of the soil impacts the structure. Conversely, in soil that is either overly alkaline or severely acidic, clays tend to become sticky and difficult to grow. The best pH range for clay soils is in the range of 5.5 to 7.0. This group of clay soils has granular, workable clay. A pH assessment (soil test) can determine if your soil can be left as is or whether it needs to be made more acidic for plants to grow healthily. Most plants thrive best in a pH range of 5.5 to 7.0. The immoderate adverse pH degree of soil can nonetheless be an improvement constraint even if it consists of ample nutrients. The pH is simply proper for plant boom in constructing sand, which is sincerely absolutely devoid of nutrients (Perry 2003).

Electrical conductivity measurements are closely tied to a variety of soil's chemical and natural properties. An object with excessive electrical conductivity should cause electrical issues (transmitted). The helpful resource of the categorization system conveyed through the use of the unit mS/m, can be utilized to establish an acceptable special value (milli Siemens per meter). The deci Siemens per meter (dS/m) method of measuring electrical conductivity is a hundred times more environmentally sound than milli Siemens per meter (mS/m) *(*Fourie, 2013).

By regulating the activities of the enzymes hydrogenase and carbonic anhydrase as well as chromosomal synthesis, zinc plays a critical part in the metabolism of plants. The breakdown of carbohydrates, preservation of the integrity of mobile membranes, protein synthesis, control of auxin production, and pollen development are just a few of the processes that are aided by plant enzymes. Zinc induces the activity of these enzymes. The potassium switch, which defends cells and open stomata, can also be facilitated. Boron will expand the plant's capability to face up to drought due to the fact cruciferous flowers want a lot of it to beautify the stability, lignification, and xylem differentiation of their cellular walls *(*Nazir et al, 2016).

Mostly acidic and with low to medium herbal fertility in Nepal's Himalayan soils. The situation has worsened as a result of recent agricultural advancements and an increased need for soil help. The use of salt, biofertilizers, and conservation tillage (land preparation for growth) are some more comprehensive strategies that may also have a long-term favourable impact on agricultural production. Because future demands on the land's resources will increase. Farmers, scientists, and policymakers must collaborate in a synergistic (interaction between two or more than two substances) way to enhance and sustain food production and to benefit both the current society and future generations (Bajrachrya and Serchan, 2009).

The findings of this study demonstrated a proportional relationship between the partially grain-free ear of corn and the reduced bioavailability of Zn and B in these soils. The finding that the disease can be treated by applying Zn and B has potential and practical significance because B and Zn shortages are both present in some soils of arid and semiarid locations.

According to two years of field testing, it is suggested that 16–24 kg/ha of zinc sulfate be applied to the soil and 1000 L F of a B solution containing 0.1 weight percent of boric acid be applied to the corn leaves to increase grain yield and decrease partially grain-free ears in calcareous soils of southern Iran with low levels of available Zn and B. It is important to keep in mind, nevertheless, that the suggestion for fertilizer depends heavily on the soil and climatic circumstances, making it impractical to provide a single treatment method for all scenarios. Therefore, it is advised that in calcareous soils with low availability of these elements, Zn and B nutrition of maize plants be given more consideration (Ziaeyan and Rajaie, 2009).

An attempt is made to study Soil analysis of National Wheat Research Farm 58 soil samples from the surface horizon (0-20 cm). Soil analysis revealed that the texture of the farm is salinity clay loam with mildly alkaline. Among the macronutrients such as total N, available P_2O_5, extractable K_2O, extractable Ca, extractable Mg, and available S are observed in varied amounts. The macronutrients content as the residue is observed as medium to high as they are: to every crop grown on the farm and the soil pH is high, Among the microns copper and iron content was found as higher level, zinc content was medium manganese and boron low (Khadka et al, 2015).

Table 7

Soil Fertility Status of Regional Agriculture Research Station, Tatahara, Sunsari, Nepal.(Khadka,2017)

Descriptive Statistics	pH	Organic Matter , %	N %	P_2O_5, ppm	K_2O,ppm
Minimum	4.58	0.19	0.04	0.78	21.6
Maximum	7.33	1.92	0.09	145.51	369.6
Mean	5.98	2.80	0.09	39.77	134.12

Methods

Study Area

The sample was collected from the Tarakhola Rural Municipality, 01, Majhakharka, Baglung. Wheat is the main crop in this locality. So, it is essential to address the issues related to wheat production.

Fig. 2

Google earth map Tarakhola municipality

Fig. 3

Google earth map Tarakhola municipality

Sample Collection and Analysis

The soil sampling area was chosen from the different locations of Tarakholar Rural Municipality-1, Majhakharka, according to the range of productivity after completing the life cycle of maize crops or before planting wheat plants with the random sampling method. 1-2 inch, upper layer of soil was removed and dug in V shape range of 20-25 cm from the edge, middle and corner parts of the Bari. Then, the samples were dried, combined and ready for chemical analysis.

Chemical Investigation

Chemical investigations were carried out from different methods which are given below

Determination of Nitrogen

One gram of soil was weighed in a 50 ml kjeldhal digestion flask and added 2 gm catalyst digestion mixture followed by 10 ml conc.H_2SO_4 and added a few pieces of broken porcelain'. 10 ml of distilled water was added for the fine texture of the soil and left it 30 minutes before adding the digestion mixture and sulphuric acid. The soil was mixed with sulphuric acid by swirling and heating in the flask at intervals and digested until the color of the mixture changed into green blue color and continued it for 1-1.5 hrs more. The flask was carefully watched for not to allow the flame to touch the above part occupied by liquid. 10ml of conc. H_2SO_4 was added to 1gm soil and 2gm digestion mixture in a 250 ml digestion tube and heated in a preheated Block digester at 410^0c for 45 minutes. Its rate was adjusted to the maximum in the beginning of the digestion and reduced after about 10 minutes and acid fumes were condensed at two-thirds of the digestion tube. The flask was cooled and added 20ml of distilled water before the solution was transferred in a 100ml volumetric flask. 20ml of the liquor was taken in a distillation flask and added to 40% NaOH and distilled. The liberation of NH_3 was collected in some 4% boric acid solution containing 2 drops of indicator mixed in 125 ml conical flask. It was titrated with 0.01N HCl in blank for each batch of 12 samples.

%N = (7N(T-B))/S,
where,
N=normality of acid
T=volume of acid used in titration
B=vol. of acid used in blank
S=sample weight

Determination of phosphorus

Two gram of soil sample was weighed in a 100 ml polyethene bottle. One teaspoon of activated charcoal and 40 ml of 0.5N $NaHCO_3$ was added in extracting solution and then shaken for 30 minutes in a shaker and then also filtered through what man no 42 filter paper some of a liquor of filtrate was pipetted in some of volumetric flask and acidified with 5N H_2SO_4 to ph 5.0 using p- nitrophenol indicators till the yellow color just disappear. After each addition of acid was shaken gently and further acid was added dropwise until the color changed from yellow to colourless. Distilled water was added for washing down the smells of the volumetric flask to 40 ml followed by 8 ml of reagent. The volume was made up to mark and shaken well. Maximum intensity of blue color was obtained in 10 minutes and remains stable up to 24 hrs. A blank was included in every batch by shaking the extracting solution without foil. The entire reagent was included in every step. Color intensity was measured in the colorimeter after 10 minutes using a red filter (660nm). The standard was prepared by taking 0, 0.5, 1, 2, 4, 6, 8, and 10 ml of 500 ml standard solution in a 50 ml volumetric flask and $NaHCO_3$ extracting solution.

Determination of potassium by flame photometer method

Two gram of air-dried soil was weighed in a 125 ml conical flask and added 20ml neutral ammonium acetate and then shaken for 5 minutes in a shaker and then filtered through what man no 42 125cm filter paper standard curve of potassium was prepared by aspirating 0 5 10 15 20 and 25ppm after assuming full-scale deflection of flame photometer with 25ppm the reading was noted and drawn a graph the soil solution was aspirated and noted its reading and determined k in the soil solution from the graph.

Determination of Organic Matter

Two gram soil was taken in a volumetric flask and added 2.5 N $K_2Cr_2O_7$ solutions. Again 2.5 ml. Conc.H_2SO_4 and 4 drops of H_3PO_4 were added in the mixture. 50 ml mixture was taken after 30 minutes in the calorimeter and reading was observed.

Calculation

OM%= Colorimeter reading x 14.47

PH of soil: A soil sample weighing 10 gm was added to a 50 ml beaker along with 25 ml of distilled water. Shake in a mechanical stirrer for about a minute, then let sit for about an hour. Use a standard buffer solution with a pH range between 4.0 and 6.86 to calibrate the pH meter. Then, using a pH meter that has been calibrated, check the pH of the soil water suspension. Water volume may be increased for peat (decompose organic materials) and muck soil (Dung soil) Determination of macronutrients and micronutrients

The Land Management and Cooperatives Department of Agriculture teaches inhabitants of Hariharbhawan, Lalitpur, about the differences between macronutrients (Zn, B), and micronutrients (N, P, K).

Procedure of EC

Forty milliliters of pure water and 20 grams of muck are stated to match in a hundred-milliliter beaker. An in-past approach used a conductivity meter to shortly and precisely show the liquid supernatant's conductivity.

Discussion

The amount of Nitrogen, Phosphorus, Potassium, Zinc, Boron, pH, electrical conductivity, pH, and Organic matter was 0.57%, 29.05 ppm(65.08 kg/hector), 159.69 ppm(357.69 kg/hector), 0.54 ppm, 0.01 ppm, 6.4, 0.87 ds/m(87 millisiemen) and 3.57% respectively was exhibited in Trakhola Rural Municipality-01, Majhakharka.

The chemical composition of the pattern is in contrast to small print from the Manual for Soil and Fertilizer Analysis, which is posted employing the Ministry of Agriculture, Land Management, and Cooperatives of Nepal and is up to date by way of the Department of Agriculture's Soil Management Directorate at Hariharbhawan in Lalitpur. The sample's zinc degree is 0.54 ppm, which is much less than the 1.62 mg/kg fertility kingdom and dynamics of soils in the Nepal Himalayas. The sample's 0.01 ppm of boron is lower than the fertility country and dynamics of the soils in the Nepal Mountains, which are 0.49 mg/kg.

The percentage of Nitrogen in the sample is 0.17% (medium) which is comparable with that of fertility status and dynamics of soils in the Nepal Himalayan (0.1-0.2) %. The amount of Phosphorus (P_2O_5) is 29.05 ppm and 65.08kg/hector which is less than the fertility status and dynamics of soils in the Nepal Himalayan (33.66 ppm).

The NPK and pH of a pattern have been in contrast to the soil fertility of the Bari and Khet Land in a small watershed in Nepal's center hill region. The soil fertility fame of Khet and Bari (N-0.14%, P, 24.05 ppm, K, 136.54, and pH-5.57) is higher than the ranges of N, P, K, and pH, which are 0.17%, 29.05 ppm, 159.68 ppm, and 6.4, respectively.

This end result outperforms soil dynamics and fertility prerequisites in the Himalayan vicinity of Nepal by way of 29.05 ppm. In the Nepal Himalayas, potash (K_2O) content material is associated with soil fertility and dynamics.

The chemical compositions (NPK, Zn, B, and organic matter), EC, and pH of Tarakhola Rural Municipality had all been investigated. These are the components: 0.17% Nitrogen, 29.05 ppm Phosphorus (65.08 kg/hector), 159.68 ppm Potash (357.69 kg/hector), and 3.57% Organic Matter. Zinc is 0.54 components per million, boron is 0.01 components per million, pH is 6.4, and electrical conductivity is 0.087 ds/m (87 micrometers).

The sample's 0.54 ppm zinc level is lower than the 1.62 mg/kg fertility popularity and dynamics of soils in the Nepal Himalayas. Samples' levels of boron are lower than the 0.49 mg/kg fertility country and dynamics of Nepalese Himalayan soils, which are measured at 0.01 ppm.

Table 8

Status of PH

S.N.	Soil Reaction (pH)	pH range
1.	Extremely acidic	<4.5
2.	Very strongly acidic	4.5-5.0
3.	Strongly acidic	5.0-5.5
4.	Moderately acidic	5.5-6.0
5.	Slightly acidic	6.0-6.5
6.	Nearly neutral	6.6-7.5
7.	Slightly alkaline	7.5-8.0
8.	Moderately alkaline	8.0-8.5
9.	Strongly alkaline	8.5-9.0
10.	Very strongly alkaline	9.5-10.0
11.	Extremely alkaline	>10

The sample's herbal recall charge of 3.57% is greater than the herbal rely fee of the central Rechna Doab region's soil fertility hassle (2.48%). The soil's pH is 6.4, which is the same as central Rechna Doab's 8.30, an incredibly acidic soil fertility problem. The sample's electrical conductivity, 0.087 dS/m (87 micrometers), or 1, has no poor outcomes on crops.

Table 9

Electrical Conductivity(Thakur et al, 2012)

EC(dSm^{-1})	**Effect**
<1	No deleterious effect on crop
1-2	Critical for salt sensitive crops
2-3	Critical for salt tolerant crops
>3	Injurious to most crops

The NPK, pH, and organic matter of a sample are compared to the Regional Agricultural Research Station's assessment of the soil's fertility level in Tarahara, Sunsari, Nepal. The Regional Agricultural Research Station measured nitrogen, potassium, organic matter, and pH at 0.09%, 134.12 ppm, 2.80%, and 5.98 ppm, respectively. On the other hand, the sample has more of these components in it. Yet, the phosphorus level of a specific sample (29.05) is lower than the regional agricultural research station's evaluation of the soil's fertility (39.77 ppm).

Conclusion

The amount of Nitrogen, Phosphorus, Potassium, Zinc, Boron, pH, electrical conductivity, pH, and Organic matter was 0.57%, 29.05 ppm(65.08 kg/hector), 159.69 ppm(357.69 kg/hector), 0.54 ppm, 0.01 ppm, 6.4, 0.87 ds/m(87 militiamen) and 3.57% respectively was exhibited in Trakhola Rural Municipality-01, Majhakharka. Where Zn and B were lowest in amount, pH, P, and K were maximum, organic matter and Nitrogen were medium, and electrical conductivity has no salt or minimum for the wheat crop. So, 1000 kg of organic fertilizer should be added to maintain the composition of NPK and organic matter. And to maintain the amount of Zn, Zinc sulfate 1kg/ ropani and B, 0.5 Kg/ropani borax should be added.

Declarations

Ethics Approval and Consent to Participate

I declare that this research/review was conducted ethically

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