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Short Communication

Investigation of some parameter and Nutrients from Soil samples of Rice field in Gadhinglaj and Ajara Tahsil of Kolhapur district, India

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Abstract

The most important variables in the soil are the plant nutrients. Laboratory study was conducted to evaluate the soil fertility status of different soil samples of Rice Field in Gadhinglaj and Ajara Tahsil. Aimed at assessing these variables .The soil samples were collected in Nov 2012 from Rice field in Gadhinglaj and Ajara Tahsil. Parameters like pH ,TDS, E.C., Water holding capacity, Nitrate nitrogen, Ammonium nitrogen, Potassium, Sulphur, Calcium, Magnesium, Chloride and Phosphorous was analyzed. It was found that soil sample S_1 has lower amount of Magnesium and Soil samples S_2 and S_4 required more secondary nutrients.

Keywords: Soil parameter, soil quality, rice field and nutrients.

Introduction

Soil fertility is simply defined as the ability of the soil to supply nutrients for plant growth. The soil is a store house of plant nutrients. The nutrients are stored in many foams, some very available to plants while some unavailable plant nutrients are essential elements needed for plant growth. Plants adsorbed 90 different elements some of these elements are needed for plant growth and some are not needed by plants.

Lack of the element stops a plant from completing growth or production. A shortage of the elements can be corrected only by supplying that elament, Nitrogen, Phosphorous and Potassium are primary nutrients which are most likely to be added to soil by fertilization. The other elements Boron, Copper, Chlorine, Zinc, Molybdenum, Iron and Manganese are labeled as micronutrients elements or trace elements. Because they are used by plants in such small quantity. Plant growth will be affected without enough of these trace elements[1].

Material and Methods

Soil Samples 1, 2, 3 and 4 were collected from Honyali, Mahagaon, Uttur and Badyachiwadi respectively[2]. The micronutrients were determined in the laboratory of Department of AGPM Devachand College, Arjunnager, Kagal Tahsil (M.S).

Results and Discussion

pH: In the present study pH was observed in the ranges of 6.9 to 8.0 .the soil sample S_1, S_3, S_4 are alkaline samples and S_2 is acidic samples.

E.C: In the present study conductivity values ranges from 0.59 mmho to 0.86 mmho. Conductivity of samples S_2 is less as compared to sample S_1, S_3 and S_4.

Available Nitrate Nitrogen: Available nitrate nitrogen in the soil samples ranges from 215.04 kg/hectare to 257.6 kg/hectare. The soil sample S_1 has high nitrate nitrogen as compared to sample S_2, S_3 and S_4.

Ammonium Nitrate Nitrogen: Available ammonium nitrate in the soil sample ranges from 399.8 kg/hectare to 270.54 kg/hectare. The soil sample S_3 has high ammonium nitrate as compared to sample S_1, S_2 and S_4.

Phosphorous: Phosphorous content in the soil sample ranges between 22.5 kg/hectare to 50 kg/hectare. Sample S_3 have more Phosphorous content as compared to sample S_1, S_2 and S_4. All samples are within normal range.

Potassium: Potassium regulates many metabolic processes required for growth, food and seed development. Many vegetables and fruits crop are high in Potassium which is vital for animal and human nutrition[3].

Potassium content in the soil sample ranges between 164.3kg/ha to 303.5 kg/ha. The soil sample S_1 has more Potassium content as compared to sample S_2, S_3 and S_4. All samples values are within the normal range.

Magnesium: Magnesium available to plants as the ions Mg^{+2}. Magnesium content in the soil sample ranges from 2% to 7 %. Sample S_1 contain less amount of Magnesium.

Chloride: In present study Chloride ranges from 25 % to 50 %. Soil sample S_1 and S_3 have low chloride content than S_2 and S_4.

Calcium: Calcium ranges from 10 ml/100gm to 25 ml/100gm. Soil sample S_2 have high Calcium content as compared to sample S_1, S_3 and S_4.

Sulphur: Sulphur content value ranges from 5.8 kg/hectare to 15.68 kg/hectare. Sample S_2 have low Sulphur content as compared to sample S_1, S_3 and S_4 .Deficiency causes plant stems are stiff, thin and woody and growth rate is retarded and maturity is delayed[4].

Total Dissolved Solids: TDS values for soil samples ranges from 0.38 to 0.66 .Soil sample S_2 has lowest TDS as compared to S_1,S_3 and S_4.

Water Holding Capacity: Different types of soil have different capacities to hold water. Sandy soil has lower capacity as compared to Clay soil. In present study Water Holding Capacity value ranges from 34.2 to 0.52. Soil sample S_3 has highest Water Holding Capacity as compared to S_1, S_2 and S_4.

Conclusion

It is concluded from the data soil sample S2 required Ammonium Phosphate and Secondary nutrients, Sample S_1 and S_3 Having good quality of Nitrogen, Phosphorous and Potassium nutrients. Conducting capacity of all samples is found to be medium. Magnesium content in soil sample S1 is in lower amount so fertilizer containing Magnesium is added for proper growth and development of the crops. All soil samples are within the permissible limit.

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Table-1
Physico-Chemical Parameters and Nutrients of Soil Samples (Rice Field)

Sr. No.	Soil Parameter	S1 Honyali	S2 Mahagaon	S3 Uttur	S4 Badyachiwadi	International Agriculture Standard for Soil Analysis
1	pH	8	6.9	7.6	7.8	5.8-8.3
2	TDS	0.66	0.38	0.53	0.48	<1
3	EC	0.86	0.59	0.75	0.68	---
4	WHC	0.42	0.37	34.2	0.52	---
5	Nitrate Nitrogen (kg/ha)	257.6	215.04	235.2	221.7	217.6-272
6	Ammonium Nitrogen (kg/ha)	272	270.54	399.8	328.29	272-544
7	Potassium (kg/ha)	303.5	191.18	164.3	236	150-340
8	Sulphur (kg/ha)	15.68	5.8	8.5	11.2	5-20
9	Calcium (ml/100 gm)	11	25	10	15	10-30
10	Magnesium (ml/100 gm)	2	7	7	6	5-10
11	Chloride (ml/100 gm)	25	50	25	50	20-50
12	Phosphorous (kg/ha)	25.08	25.08	50.16	22.5	22.5-56