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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Available online at: www.isca.in
Received 6th April 2013, revised 17th April 2013, accepted 6th May 2013

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 S₁ has lower amount of Magnesium and Soil samples S₂ and S₄ 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 element, 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, Molydbenum, 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 elements¹.

Material and Methods

Soil Samples 1, 2, 3 and 4 were collected from Honyal, Mahagaon, Uttur and Badyachiwadi respectively². 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 S₁, S₃, S₄ are alkaline samples and S₂ is acidic samples.

E.C: In the present study conductivity values ranges from 0.59 mmho to 0.86 mmho. Conductivity of samples S₂ is less as compared to sample S₁, S₃ and S₄.

Available Nitrate Nitrogen: Available nitrate nitrogen in the soil samples ranges from 215.04 kg/hectare to 257.6 kg/hectare. The soil sample S₁ has high nitrate nitrogen as compared to sample S₂, S₃ and S₄.

Ammonium Nitrate Nitrogen: Available ammonium nitrate in the soil sample ranges from 399.8 kg/hectare to 270.54 kg/hectare. The soil sample S₃ has high ammonium nitrogen as compared to sample S₁, S₂ and S₄.

Phosphorous: Phosphorous content in the soil sample ranges between 22.5 kg/hectare to 50 kg/hectare. Sample S₁ have more Phosphorous content as compared to sample S₁, S₂ and S₄. All samples values 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 nutrition³.

Potassium content in the soil sample ranges between 164.3 kg/ha to 303.5 kg/ha. The soil sample S₁ has more Potassium content as compared to sample S₂, S₃ and S₄. All samples values are within the normal range.

Magnesium: Magnesium available to plants as the ions Mg²⁺. Magnesium content in the soil sample ranges from 2% to 7%. Sample S₁ contain less amount of Magnesium.
Chloride: In present study Chloride ranges from 25 % to 50 %. Soil sample S₁ and S₃ have low chloride content than S₂ and S₄.

Calcium: Calcium ranges from 10 ml/100gm to 25 ml/100gm. Soil sample S₂ have high Calcium content as compared to sample S₁, S₃ and S₄.

Sulphur: Sulphur content value ranges from 5.8 kg/hectare to 15.68 kg/hectare. Sample S₂ have low Sulphur content as compared to sample S₁, S₃ and S₄. Deficiency causes plant stems are stiff, thin and woody and growth rate is retarded and maturity is delayed⁴.

Total Dissolved Solids: TDS values for soil samples ranges from 0.38 to 0.66. Soil sample S₂ has lowest TDS as compared to S₁, S₃ and S₄.

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 S₃ has highest Water Holding Capacity as compared to S₁, S₂ and S₄.

Conclusion

It is concluded from the data soil sample S₂ required Ammonium Phosphate and Secondary nutrients, Sample S₁ and S₄ 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.

References


Table-1

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

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