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Center for Smart Agriculture

Applied Hi-Tech Horticulture

Module 1: EC, pH based fertilizer

Session 8: Analysis of EC and pH

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Soil pH

- The soil pH is the negative logarithm of the active hydrogen ion (H+) conc. in the soil
- solution.
- It is the measure of soil sodicity, acidity or neutrality.
- It is a simple but very
- important estimation for soils, since soil pH influences to a great extent the availability of
- nutrients to crops.
- It also affects microbial population in soils.

Most nutrient elements are available in the pH range of 5.5 to 6.5.

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- pH range of fertilizers solution delivered in soil effects the soil properties.

- Calcium, Phosphorus, potassium and magnesium are unavailable to plants in acidic soil.

- Plants have difficulty in absorbing micronutrients like copper, zinc, boron, manganese and iron in basic soils; however their presence in soil can also be excessive and become toxic to plants.

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Apparatus

- pH meter
- Pipette/dispenser
- Beaker
- Glass rod

Reagent

- Buffer solutions of pH 4, 7 and 9.2
- Calcium chloride solution (0.01M): Dissolve 14.7 g $CaCl_2.2H_2O$ in 10 litre of water to obtain 0.01M solution.

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Procedure

1. Calibrate the pH meter, using 2 buffer solutions, one should be the buffer with neutral pH (7.0) and the other should be chosen based on the range of pH in the soil. Take the buffer solution in the beaker. Insert the electrode alternately in the beakers containing 2 buffer solutions and adjust the pH. The instrument indicating pH as per the buffers is ready to test the samples
2. Weigh10.0g of soil sample into 50 or 100 ml beaker, add 20ml of $CaCl_2$ solution (use water instead of $CaCl_2$ solution throughout the procedure if water is used as a suspension medium).
3. Allow the soil to absorb $CaCl_2$ solution without stirring, and then thoroughly stir for 10second using a glass rod.

4. Stir the suspension for 30 minutes and record the

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Electrical Conductivity

- Salinity of solution is measured by common way using electrical conductivity (EC) sensor.

- This sensor measures the electricity moves through a saltier solution, the electricity moves through it is directly proportional to the conductivity readings.

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➢EC is measured in dS/cm (deciSiemens per centimeter).

➢ In all soils salts are naturally
present additional salts build up
in the soil by higher concentration
of fertilizers applied

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THANK YOU