Basics About Plants Nutrients and Its Importance in Agriculture

- The beneficial effect of adding mineral elements to soils to improve plant growth has been known in Agriculture for more than 2000 years.

- Justus von Liebig (1803-1873) that the scattered information concerning the importance of elements for plant growth was compiled and summarized and that the mineral nutrition of plants was established as a scientific discipline first time.

- **Definition of plant nutrition:**

  - ***Nutrient:*** Nutrients are substances required by an organism for their normal growth and reproduction.

  - ***Plant Nutrient:*** The plant nutrient is a "food" which is composed of certain chemical element soften referred to as 'plant nutrient' or plant food elements considered very essential for growth and development of plants.

  - ***Nutrition:*** The supply and absorption of chemical compounds needed for growth and metabolism of an organism.

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- **Criteria of Essentiality of Nutrients:**

  - The **term essential element (or mineral nutrient) was proposed by Arnon and Stout (1939).**

  - These authors concluded that, for an element to be considered essential, there criteria must be met-

1. A deficiency of an essential nutrient element makes it impossible for the plant to complete the vegetative or

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reproductive stage of its life cycle.

2. The deficiency of an element is very specific to the element in question and deficiency can be corrected /prevented only by supplying that particular element.

3. The element must directly be involved in the nutrition and metabolism of the plant and have a direct influence on plant apart from its possible effects in correcting some micro-biological or chemical conditions of the soil or other culture medium.

➢ **Types of nutrients elements:**

- Plant nutrient elements are broadly grouped in to two types.

A. Essential Nutrients/ Elements
B. Beneficial Nutrients/Elements

A. Essential Nutrients/ Elements-

➢ **"The elements needed by the plant without which the plant is not able to survive and complete its life cycle are called essential nutrient".**

Or

➢ "An essential nutrient element is the one which is required for the normal life cycle of an organism and where functions cannot be substituted by any other chemical compound".

➢ Plants absorb or utilize more than 90 nutrient elements from the soil and other sources during their growth and development and about 64 nutrients have been identified in plants by their tissue analysis.
➢ But all are not essential for their growth and development. They require only 17elements/nutrients.

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- **These 17 have been recognized as essential elements.**
- **B. Beneficial elements:**
- Beneficial elements are the mineral elements which stimulate the growth and have beneficial effects even at very low concentration.
  - **They are not essential or essential only for certain plant species under specific conditions.**
  - They are also known **as 'potential micro-nutrients'.**
  - These elements have been found to affect the uptake, translocation and utilization of other essential elements, help in production of essential metabolite by activating enzymatic system/action and also counteract the toxic effects of some other elements or anti metabolites.
  - Eg: Silicon (Si) for rice, Sodium (Na), Aluminium (Al), Cobalt (Co), Selenium (Se), Iodine (I), Gallium (Ga)and Vanadium (Va).

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Note:- This PDF Is Provided to understand the basic concept about the plant nutrients & its importance in agriculture

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