

Introduction to Inorganic and Organic Nutrients

By David W. Dibb

The word nutrient is a derivation of the word nutrition, which implies food. The term essential nutrient, then, is redundant in the sense that essentiality is defined as necessary to sustain life and food sustains life. In the plant world, an element is considered essential if it is necessary for the plant to complete its life cycle. No other element can substitute for it completely. Of the elements that have been identified by scientists, only a relatively small proportion is known to be essential to plants and animals.

Plant nutrients include gases, metals, and non-metals. All exist naturally, in both inorganic and organic forms. Three of the nutrients, nitrogen (N), phosphorus (P), and sulfur (S), are present in both inorganic and organic forms. Crops grow in a very thin layer of the Earth's crust, so it is important that nutrient levels be maintained by the addition of both organic (plant and animal residues) and inorganic (manufactured mineral fertilizers) sources.

Sometimes the word organic is used in connection with food. Often it is used to suggest that organic foods contain only good or natural elements that somehow enhance plant and animal health when compared to those foods grown with synthetic chemicals. Actually, whether organic or inorganic, all elements are chemical. The term organic relates to living (or the remains of once living) substances which contain carbon (C). Organic substances (dead plant or animal

material in some stage of decomposition) are found in all agricultural soils and are constantly in transition back to their inorganic form. As they decompose, they contribute to the total soil inorganic nutrient pool necessary to grow the world's food requirement.

Attempting to separate organic and inorganic nutrients is difficult and of limited value because nature's processes are continually cycling them from one form to another. All nutrients go through natural cycles, following various pathways to their final destination of

being absorbed and utilized by plants that grow all the food for humans and animals. In the process, some, such as N, P, and S, cycle back and forth between the inorganic and organic pools.

It is important to note that when supplied to plants in the organic form, nutrients still must cycle through the inorganic form before becoming available to plants. In fact, organic nutrient sources can be differentiated from inorganic (mineral) fertilizers in that they must be decomposed before the nutrients they contain are released, hopefully at a time when crop plants can use them. On the other hand, inorganic nutrients are supplied in soluble or slowly soluble forms, so the plant will have them available and take them up when they are needed. **BC**

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There are differences in inorganic and organic nutrients, but there are also similarities. It is important to understand the advantages and disadvantages as well as the limitations of both nutrient sources.