



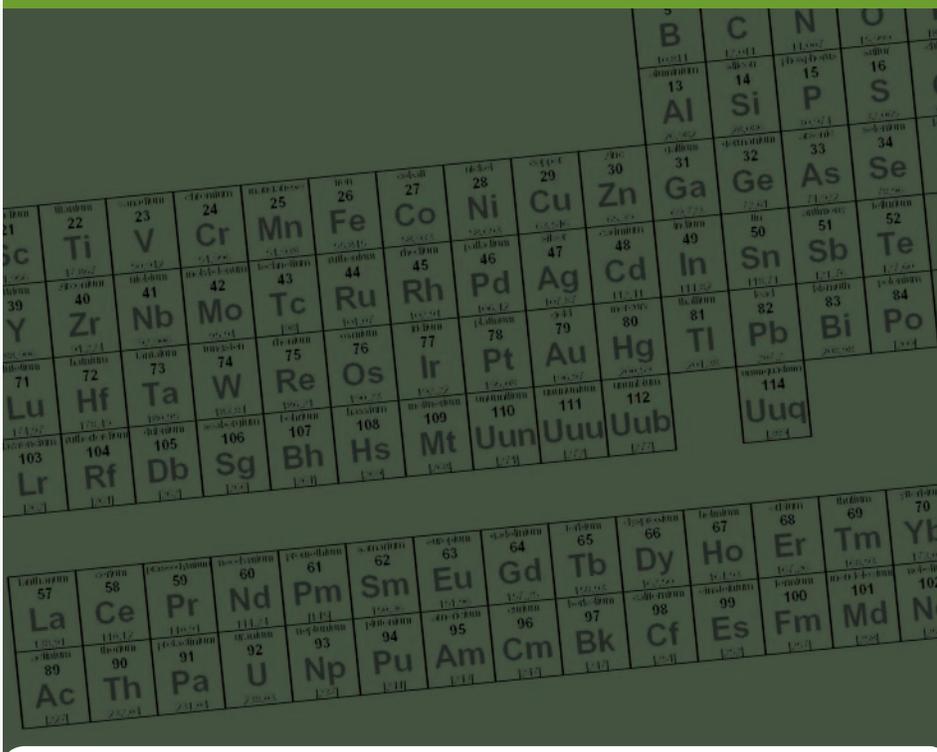
JUST 4 GROWERS

GLOBAL GARDEN COMMUNITY

INFOSHEET 10201:

Plant Nutrition & Growth Enhancers

Introduction to Nutrients:
Which Elements Do Plants Need?



Introduction



A plant obtains everything it needs to grow from one of two places: the air around its leaves or the water around its roots. The air supplies carbon and oxygen. Water supplies hydrogen and also acts as a carrier for a variety of other elements. These elements are known as “plant nutrients” and are essential for a plant to grow and bloom.



Plant nutrients are commonly divided into three groups: primary, secondary, and micro. Plant nutrients have other characteristics too, such as the ideal pH for optimal absorption, and whether they have the ability to move around inside the plant (mobile or immobile.)

Each plant requires a different balance of nutritional elements at different phases of its life cycle. Nutrient manufacturers try to make the grower’s life as straightforward as possible by creating easy-to-use complete formulations to support vegetative growth (roots, leaves, and stems) and flowering (buds, flowers, and fruits).

As well as carbon, oxygen and hydrogen (the non-mineral elements) there are many additional mineral elements that are either essential or beneficial to plants. Exactly how these elements are supplied is dependent on your growing method. Hydroponic growers supply these elements directly via a mineral nutrient solution. Organic growers use beneficial biology and a mixture of organic inputs and soil / peat-based mixes.

Primary Nutrients

N Nitrogen

Essential for rapid growth, vigor, and chlorophyll production (for photosynthesis). Some plants (i.e. legumes) are able to absorb nitrogen directly from the air.

P Phosphorus

Vital for many energy-related processes. Important for production of plant oils, sugar, and starch production. Encourages blooming and root growth.

K Potassium

Regulates your plant’s water content and a key component of yield quality and quantity.



Secondary Nutrients

Ca**Calcium**

Strengthens cell walls (think of strong bones) and helps to retain other elements.

Mg**Magnesium**

Contributes to crop quality, leaf chlorophyll, and enzymes.

S**Sulfur**

Forms an essential component of many amino acids and proteins. Also aids root growth.

Micro Nutrients

B**Boron**

Needed for root, shoot, and fruit development.

Cl**Chlorine**

Aids plant metabolism.

Cu**Copper**

Influences photosynthesis, aids root metabolism, and reproductive growth (e.g. seeds).

Fe**Iron**

Influences photosynthesis and an essential part of chlorophyll production.

Mn**Manganese**

Helps enzymes to break down carbohydrates and assists in nitrogen metabolism.

Mo**Molybdenum**

Plays a key role in plant enzyme systems that control the uptake of nitrogen.

Zn**Zinc**

Part of the production of important plant hormones like auxin (which regulates growth).

The Most Important Element?

**C****CARBON (from CO₂)**

Carbon is a basic element of all life on this planet—plants get hold of it in the form of carbon dioxide (CO₂). As plants photosynthesize they absorb carbon dioxide from the air transforming the inorganic carbon in CO₂ into an organic form of carbon to make carbohydrates and proteins.



There are many other micronutrients that are not 100% essential but they have proven to be beneficial and may be included as part of your liquid mineral nutrients. These include—silicon, nickel, cobalt, sodium, selenium, vanadium, and silver.

Try not to think about elements individually. It's not just about making sure all these elements are present. It's about the ratios between various elements. Too much of one element can lock out another. Too little of one element can make another harder to metabolize. Start with the best quality water you can and always use professionally blended nutrient products.

Pro Tools

**pH Meter**

This makes regular testing of your nutrient solution easy.

**Conductivity Meter**

Quickly check the strength of your nutrient solution.

IN ASSOCIATION WITH:

DON'T FORGET TO CHECK OUT THESE INFOSHEETS:

- ▶ **10302** Adding carbon dioxide to your garden
- ▶ **10502** How do plants feed?
- ▶ **10603** One, two and three part nutrient systems



For grow tips, expert advice, and educational videos check out JUST4GROWERS.COM