ALBION PLANT NUTRITION
Minerals • Science • Chelates

Plant Nutrition Newsletter

An Albion Plant Nutrition Publication helping put Metalosate® to work for you.

June 2008 Volume 9, No. 5

What are the Metalosate® Products?

by Kevin Dickinson edited by Jeremy O'Brien

The Metalosate® Products

The Metalosate® products are unique chelated minerals specifically designed for foliar application on plants. They are unique because the minerals are chelated with amino acids. Since amino acids are the basic building blocks of protein, they are natural molecules found in all living things.

What is Chelation?

Chelation is the process of attaching a specific organic molecule called a ligand to a mineral ion at two or more sites to form a ring structure. Chelates can either be synthetic or natural. EDTA, DTPA, EDDHA and similar molecules are examples of synthetic chelating agents. Hemoglobin and chlorophyll are examples of natural chelates. Albion's amino acid chelates are chemically very similar to naturally occurring chelates found in plants, animals and humans.

The advantage of using natural chelated forms of minerals is that the amino acid ligands surround and protect the minerals from adverse interactions. These interactions can take place in a solution, in the soil, or on the surface of the leaf. They often render non-chelated minerals unavailable to the plant. Because Albion uses natural amino acids to chelate the minerals, they are rapidly absorbed, translocated and metabolized by plants, animals and humans.

Does Solubility Matter?

Solubility in water is essential for absorption by plants. This is true of the systemic chemicals as well as nutrients. The material must be soluble to pass through the surfaces and into the cells of the plant. Insoluble mineral salts, including all oxides, most hydroxides, carbonates and phosphates, and some sulfates cannot be absorbed by the plant. When a foliar application of these forms of minerals is made, they simply coat the unavailable mineral on the external surfaces of the plant. In contrast, all of the Metalosate® products are completely soluble in water.

The Cuticle of the Leaf

In order for a nutrient to be effective when applied as a foliar spray, it must pass through the cuticle of the leaf. The leaves of most plants have a thick waxy surface called the cuticle. Waxes are made up of fatty acids, which by their nature have a negative charge. When a metal salt is dissolved in water, the metal dissociates in the solution to form a cation, which is positively charged mineral element. When this solution is applied to the waxy surface of the leaf, the positively charged element is attracted to and bound to the negatively charged leaf surface. This means that the waxy cuticle serves as a barrier against the absorption of ionic minerals.

Absorption and Translocation of the Metalosate® Products

Minerals completely chelated with amino acids are neutral in charge. They are neither attracted to nor repulsed from the negatively charged surfaces of the leaf. Thus, they freely pass through the cuticle. When the amino acid chelates reach the cell membrane, they are recognized by the mechanisms of absorption as a source of organic nitrogen. As a result, the entire amino acid chelate is taken into the cell very rapidly and efficiently.

Albion's amino acid chelates are very small molecules. Consequently, they readily pass through the plant's barriers against absorption, including the cuticle, and the cell membranes. Albion's research has indicated that plants can absorb 90% or more of foliar applied Metalosate® products within two or three hours.

For more specific information regarding the Metalosate® products and specific crop-nutrient programs in your area, please contact your local Albion Plant Nutrition Representative.

Albion Plant Nutrition • 101 North Main Street, Clearfield, Utah 84015 USA
[P] +1-801-773-4631 • [TF] 800-453-2406 • [F] +1-801-773-4633 • www.AlbionMinerals.com • [e] info@AlbionMinerals.com