



DeltAg Formulations “Our Chemistry”

Question: What does the word “Chelate” mean?

Answer: This is the bringing together of a nutrient metal with the chelating agent to a bound molecule. “The binding together chemically into one”.

Question: What does the word “Complexing” mean?

Answer: This is ‘attachment’ of molecules together in a weak bond that allows for transport and easy release. Separate Molecules, not strongly bound together.

Remember

“It’s not what you put out, but what you get into the the plant.....that counts”

Question: Why do we complex our products?

Answer: The practice of supplying plants with chelated or complexed nutrients is well known in the industry. These products have been categorized for years.

A. Synthetic Metals: EDTA, NTA, EDDAA etc.

B. Long chain natural organics:

- Polyflavanoids
- Lignosulfonates
- Glutamic Acids
- Amino Acids
- Humic and Fulvic Acids
- Polyphosphates

C. Short chain or small organics:

- Citric Acid
- Ascorbic Acid
- Tartaric Acid
- Adipic Acid

At *DeltAg*, we consider Complexing to be the best way to improve nutrient uptake through roots or foliage. EDTA has been the long standing preferred chelator for soil applied nutrients for over twenty years. However, with the increased use of foliar nutrients, another method of chelation, that of organic complexing, has been searched for and found.

Question: Why do we prefer complexing over chelating?

Answer: Synthetic chelating agents such as EDTA are very expensive and are not believed to assist the plant in taking up nutrients through the leaf. Also, chelated metal salts are pH sensitive and chelating agents tend to fall out with time giving the chelated compound a relatively short shelf life. It is also believed that foliar uptake of nutrients is very pH sensitive. A product with an acid pH is much more efficient for foliar applications while chelating agents tend to have a better shelf life at an alkaline to neutral pH. Therefore, preferring to manufacture low pH (acid) foliar products, we see the need to utilize some form of "Activator" or chelation other than EDTA.

Question: Why not use Humic Acid as a natural organic chelator?

Answer: The long chain natural organic chelating or complexing agents, particularly Humic Acids do help the plant in translocating nutrients. Humic Acid is pH sensitive however, and cannot be mixed with fertilizers that are acid or neutral and becomes somewhat insoluble. Humic Acid products are also black in color and quick to stain equipment or containers and are less than desirable.

Question: Then what mode of complexing do we use?

Answer: Fulvic acid is a derivative or, an acid radical, found in Humic Acid. It is very difficult to extract in significant quantities. Once extracted and processed it becomes a concentrated form of organic complexor similar in action to EDTA chelates or Humic complexors. This process generates a concentrated product, orange in color that reacts well in a low pH (acid) nutrient solution. The proprietary complexor developed by *DeltAg*, we like to describe as a "Synthetic Fulvic Acid" because it reacts similar to Fulvic Acid in plant chemistry. We believe it to be a fulvic acid ore, therefore the name "*Fulvore*".

In Review: Standard Chelating Agents stay soluble only in high pH solutions and have a long shelf life – but high pH solutions are not crop responsive and will tend to salt out on the leaf surface.

The Organic Acid Complexing Agent, "*Fulvore*" will stay soluble in most any pH solution (especially low pH) and have an undetermined long shelf life. Low pH solutions tend to get taken into the leaf with very little salting out. The result is better nutrient uptake and translocation.

*Our "*Fulvore*" is clean and concentrated rather than black and diluted.

Summary: We have developed a clear organic acid complexing agent that reacts and stays soluble in an acid solution which is much preferred for foliar and soil nutrient efficiency. This allows the use of *DeltAg's* "active chemistry".