

Smartrace Chelated Elements

Spraygro Smartrace chelated nutrients are freshly prepared liquid fertilizers to provide the elemental forms and/ or plant absorbable form of nutrients.

We chelate metal ions with lignosulfonate polyphenols and carboxylic groups to ensure maximum availability of the nutrients to plants.

Lignosulphonates are the by products of pulp and paper industry, are thus organic in nature. They have an innate ability to act as a wetting and dispersing agent, are sticky in nature, and forms a reversible bond with plant's cuticle layer. Lignin, being a large molecule with a molecular weight in the vicinity of 250,000, does not penetrate the plant's cell membrane; however, it helps adhesion of the spray droplets on the leaf surface and retain the chelated metal ions.

As indicated above, the bond between the lignin and cuticular membrane is reversible, and the binding of metal element to the polyphenol moieties of lignin is relatively weak, the element is slowly and constantly released over the leaf surface and enters the plant cell through diffusion. To cut the long story short, the stickiness binds the spray droplets to fatty acid molecules of cuticle and weak bonding between polyphenol and metal element release the elements into leaf cells.

Most of the metallic micronutrients such as zinc, manganese, iron and copper are readily absorbed in their ionic form then their oxide forms. Oxide forms are least soluble and more suitable to protect rusting in iron, rather than the source of micronutrients especially when they are to be applied through the foliage. Spray application of oxides of micronutrients leaves a white film over the leaf surface. This film may interfere with photosynthetic gas exchange. Moreover, oxides do not correct deficiencies of the current crop. Soil application of oxides of Zn is suitable to correct zinc levels in soil for obtaining better growth rates for the subsequent crop. This form of zinc is released slowly over a period of time and does not bind with soil phosphorus forming insoluble zinc phosphate. Phosphorus deficiency is a common observation in paddocks treated with Zinc oxide precisely due to the aforementioned reason.

Lignosulfonates are equally good for soil application. The carbon content in lignosulfonates improves the soil aggregates and thereby improves the physical, chemical and biological properties of soil. Lignosulphonate chelates works well over a wide range of soil pH levels. Synthetic chelates such as EDTA are very suitable for foliar application but dissociates rapidly under slight to severe alkaline conditions in soils. EDTA being relatively small molecule can penetrate the plant cuticle and cell membrane to deliver the nutrient into the cell cytoplasm. However, EDTAs do not have wetting and dispersing properties compared to lignosulfonate.

In terms of economy and efficiency of micronutrient application and penetration, the lignosulfonates are better than EDTAs, and EDTAs are far superior than oxides. Lignosulfonates rainfast in 2-3 hours of application, deliver nutrients at a steady and controlled rates, and reduce scorching of foliage due to sudden nutrient overload.

The SprayGro Smartrace series of single and multiple micro-nutrient blends are compatible with each other. We also chelate macronutrients such as calcium and magnesium to ensure optimum availability of these essential elements to plants. Smartrace chelates are kinder to spray equipment, and do not clog and wear out nozzles.



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