By-product Iron-humate Increases Tree Growth and Fruit Production of Orange and Grapefruit

A new Fe by-product of drinking water decolorization using ferric sulfate, containing high Fe concentration, has recently become available. Iron is complexed with organic fractions (primarily humic and fulvic acids) in the water, and settles as an organically chelated material referred to as Fe humate (FeH). Characterization studies confirm the organic chelation property of this Fe source (Sartain and Varshovi, 1992, unpublished data). An increasing number of water treatment plants are adopting the use of ferric sulfate, instead of using aluminum sulfate. As a result, the by-product FeH is readily available and is considerably more economical then Fe-EDDHA. Since FeH is a by-product of the drinking water decoloration process, it does not contain any toxic elements, and soil application is environmentally safe. The objectives of this study were to evaluate the effects of several application rates of FeH to high pH soils on 1) growth and leaf Fe concentrations of nonbearing citrus trees, and 2) leaf Fe concentrations and fruit yield and quality of grapefruit and oranges.

These field tests of several FeH preparations on four calcareous south Florida citrus groves showed that FeH increased leaf Fe concentration, young tree growth, and fruit yield. In some experiments, the positive response to FeH was equivalent to that of Fe-EDDHA chelate, which is the standard but more expensive Fe source currently available for use on calcareous soils. Applying high FeH rates to citrus trees did not result in negative effects on tree growth and production, or in the soil chemical composition. The average price of commercial Fe-EDDHA products (containing 6% Fe) in the Florida market is $23.50 per kilogram vs. $0.22 per kilogram for FeH (containing = 16% Fe). Due to the high cost of Fe-EDDHA, this product needs to be applied on a tree basis, whereas FeH can be broadcast using commercial fertilizer spreaders. Therefore, both product cost and application costs are greater for Fe-EDDHA then for FeH. This study clearly demonstrated the effectiveness of FeH for correction of Fe deficiency in citrus. Accordingly, FeH is an economical Fe source for citrus. Large-scale long-term demonstration studies in a commercial citrus groves using fertilizer broadcast equipment are necessary to develop FeH application rate recommendations on an area basis.

The above is an excerpt from A.K. Alva & T.A Obreza's paper: By-product Iron-humate Increases Tree Growth and Fruit Production of Orange and Grapefruit

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