



Micronutrient Management for Vegetable Crops Grown in Florida in the BMP Era¹

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This publication is one of a series entitled Fertilizer and Irrigation Management in the BMP Era.

This series is divided into nine principles described in the Introduction Chapter (HOS-897). This publication is part of Principle 2, "Soil Test and Follow the Recommendations." BMP implementation requires a global approach to production management. However, for presentation purposes, each aspect of vegetable production is described in a separate publication.

Sixteen nutrient elements have been proven to be essential for the growth and reproduction of higher plants. Three of the elements, carbon, hydrogen, and oxygen are supplied from the air and water. There is little control over the availability of these nutrients. The dry tissue of most plants is composed of 94% of these three elements. The other 13 elements combined represent less than 6% of the plant dry matter. The 13 elements consist of two groups, micronutrients and macronutrients. These 13 elements are either supplied by the soil or supplemented by fertilizer. Generally, crop growth is limited by a deficiency of one or more of the 13 elements.

Different mechanisms of removal, fixation, and release affect the availability of micronutrients to the plants from the soil. Soil pH is one of the most important factors affecting micronutrient availability. It has been common in Florida vegetable production to routinely apply a micronutrient package since these nutrients are inexpensive and their application is viewed as insurance for high yields. Compounding the application issue has been the vegetable industry's use of micronutrient-containing pesticides for disease control. Copper (Cu), manganese (Mn), and zinc (Zn) from pesticides can accumulate in the soil. This has forced some vegetable producers to over-lime in an effort to avoid micronutrient toxicities. A more accurate assessment of micronutrient requirements is now available based on research.

Working Definition

Micronutrients are essential elements that are required in small (micro) amounts by plants. They are manganese (Mn), iron (Fe), boron (B), zinc (Zn), copper (Cu), molybdenum (Mo), and chlorine (Cl). These elements are sometimes referred to as minor or trace elements.

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Planning and Fertilization Considerations – Things to Do

- Have a calibrated micronutrient soil test conducted every 2 to 3 years.
- Broadcast micronutrients when applying phosphorus, if needed, based on soil testing.
- Incorporate the micronutrients in the bed area.
- Refrain from “shotgun” micronutrient fertilizer applications.
- Use foliar fertilization as a last resort for correcting a micronutrient deficiency in general.
- Band or foliarly apply micronutrients, such as Fe, Mn, and B, when growing crops on calcareous soils.
- Apply micronutrients when a specific deficiency has been clearly diagnosed.

Things to Avoid: Potential Pitfalls

- Do not make unneeded applications of micronutrients. Indiscriminate application of micronutrients may reduce plant growth and restrict yields because of toxicity.
- Do not over-lime the soil as this practice can tie up micronutrients.

Additional Readings

Soils and Plant Nutrition, FS SL8, Fla. Coop. Ext. Ser., IFAS, Univ. of Fla.
<http://edis.ifas.ufl.edu/MG091>

Soil and Fertilizer Management for Vegetable Production in Florida, HS711, Fla. Coop. Ext. Ser., IFAS, Univ. of Fla. <http://edis.ifas.ufl.edu/CV101>