Chapter 11

Environmental and Soil Factors Affecting Micronutrient Deficiencies and Toxicities

J. T. MORAGHAN, North Dakota State University, Fargo, North Dakota
H. J. MASCAGNI, JR., University of Arkansas, Keiser, Arkansas

The availability of the essential micronutrients B, Cu, Fe, Mn, Mo, and Zn to plants is often poorly related to the total quantity of the particular element in the soil. Soil properties such as pH, redox potential, organic matter content, nutrient interactions, the type of plant or variety, and environmental factors, such as soil water content, temperature and light, greatly influence the likelihood that a plant will exhibit micronutrient-deficiency or -toxicity symptoms. Changes in the environment often have a greater effect on micronutrient than on macronutrient nutrition of plants.


I. ENVIRONMENTAL FACTORS

This section will examine the specific effects of environmental factors on the solubility of the micronutrients in soil. In addition, it will focus on the effects of temperature, light, and soil moisture content on the uptake, translocation, and metabolism of these micronutrients. Little attention will be paid to nutrient dilution effects resulting from the environmental influence.