



University of Kentucky
UKnowledge

Soil Science News and Views

Plant and Soil Sciences

7-1985

Micronutrients in Kentucky

William O. Thom

University of Kentucky, wthom@uky.edu

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Follow this and additional works at: https://uknowledge.uky.edu/pss_views

 Part of the [Soil Science Commons](#)

Repository Citation

Thom, William O., "Micronutrients in Kentucky" (1985). *Soil Science News and Views*. 113.
https://uknowledge.uky.edu/pss_views/113

This Report is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in Soil Science News and Views by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Department of Agronomy

Soil Science News & Views



Vol. 6, No. 7

July 1985

Micronutrients in Kentucky

William O. Thom

Micronutrients required for normal plant development and fruiting include boron, copper, iron, manganese, molybdenum, and zinc. Unlike the macronutrients (N, P, K, Ca, Mg and S), the quantities of micronutrients needed by agronomic crops is very small. Kentucky soils may contain large amounts of micronutrients in their mineral composition but only small amounts may be available for plant uptake. The soil availability and crop uptake of micronutrients are influenced by soil pH, soil temperatures, crop root growth, soil moisture, crop species and soil organic matter content.

Boron

Crops such as alfalfa grown for hay and red clover grown for seed production respond to an annual application of 1.5-2.0 lbs of elemental boron. Corn in Kentucky may respond to 1.0-1.5 lbs boron per acre if both the amount in the ear leaf tissue at tasseling is 5 ppm or less and a soil sample from the same field has less than 1 lb boron per acre. Plant availability of boron is related to available soil moisture, the lack of which can reduce boron uptake during long dry periods.

Copper

There has been no measured response to copper for agronomic crops in Kentucky. Analysis of plant tissue for about 1000 samples over the last five years indicates that copper levels are adequate but in the lower portion of an adequate range. Research has been unable to increase plant uptake except with very large applications which are uneconomical and do not increase yields.

Iron

Soils in Kentucky contain very large amounts of iron which are available in sufficient quantities for agronomic crops to grow and development normally. Even though iron availability is depressed with a soil pH above 7, research has not measured nor has there been any observed need for iron on agronomic crops.

Manganese

A response to foliar applications of manganese on soybeans has been observed in Kentucky on a few soils in the Western Coalfields physiographic area. To date, soil tests for manganese have not been helpful in identifying the problem. A foliar application after symptoms appear has been superior to soil applications at planting.

Molybdenum

Crops such as tobacco, soybeans and forage legumes have responded to either transplant or broadcast applications of molybdenum (Mo) when the soil pH at transplanting or seeding is between 5.5 and 6.3. Plant available molybdenum increases with soil pH. The use of 1.6 oz of Mo per acre in transplant water or 6.4 oz Mo per acre broadcast before transplanting tobacco or seeding of legumes is adequate. Apply no more than 12.8 oz actual Mo per acre over a 5 year period.

Zinc

The incidence of zinc (Zn) deficiency in central and south-central Kentucky is prominent enough to suggest that a zinc soil test should be used where zinc deficiency on corn has been suspected or previously observed. Zinc uptake in corn can be reduced with very high soil test phosphorus, high soil pH, cool soil temperatures and reduced root growth. When zinc is needed for corn, 6-8 lbs actual Zn can be placed beside the seed in a separate furrow or 20-30 lbs actual Zn can be broadcast prior to planting. The broadcast will provide sufficient Zn for 3 years but the row treatment should be applied annually.

Sources and Need

When micronutrients are needed the most economical sources are the inorganic forms namely solubor (20.5% B), manganese sulfates (22-34% Mn), sodium molybdate (39% Mo) and zinc sulfate (36% Zn). Other sources such as liquids, chelates and frits are available but usually are more expensive than inorganic sources. Micronutrient needs should be determined with information from soil test results, plant tissue analysis and field observations. When the problem is identified use the recommended amount of material to correct the problem. The use of several micronutrients at low levels will not correct problems, will often be costly and may result in toxicity if applied annually for several years.