MICRONUTRIENT FERTILITY FOR SOYBEANS FACT SHEET

This is one in a series of fact sheets from the Mississippi Soybean Promotion Board and the soybean checkoff. Each sheet presents a brief overview of a topic important to Mississippi soybean production. More information on each topic can be accessed through the link at the bottom of the sheet. To see other fact sheets, click here.

Micronutrients are essential elements that are used in small quantities [< 1 lb./acre] by plants to conduct critical metabolic processes. If a necessary micronutrient is limited or unavailable, plant abnormalities, reduced growth, and lower yield will result.

Micronutrients used by plants include boron [B], chlorine [Cl], copper [Cu], iron [Fe], manganese [Mn], molybdenum [Mo], and zinc [Zn]. The amount of these micronutrients is usually sufficient in most soils to meet crop needs.

Most micronutrients are weakly mobile or immobile in plants. Thus, deficiency symptoms will usually appear most severe in the newest plant tissues; e.g., the newest trifoliate in soybean.

Soil and plant analysis are both useful for determining levels of micronutrients in soil and plant tissue, respectively. However, soil tests for them are not as precise as those for pH, P, and K.

Plant tissue analysis can reliably determine the level of most micronutrients in the sampled plant part, and the results can aid in diagnosing a visual problem. However, once a micronutrient deficiency is detected, the plant has already suffered irreversible yield loss. Thus, results from these analyses can only be used to prevent such deficiencies in a future crop.

There is not a wealth of evidence showing that micronutrient deficiencies are soybean yield limiters in the same manner as macronutrients. There are indications that soybean seed yield may respond to Mn application if soil test results indicate that Mn concentration is less than 20 ppm.

In most cases, plant tissue nutrient concentrations indicate that micronutrient levels in soils in most production fields are sufficient for maintaining soybean yield. Thus, the soil reservoir of each micronutrient is usually sufficient without additional fertilization. Soil pH level is critical for the availability of several micronutrients to plants.

Levels of micronutrients in soybeans are seldom increased by micronutrient fertilization compared to a non-fertilized control. Thus, a yield response to direct application of micronutrients is unlikely for soybeans.

Increasing soybean seed yield will result in greater removal of micronutrients from soil. Thus, a continuing period of above-average yields will result in the removal of micronutrients at a pace that exceeds the heretofore perceived normal rate.

Tissue concentrations of micronutrients are not appreciably related to their respective soil test results or to seed yield. Thus, tissue micronutrient concentration should not be used to determine when micronutrient fertilizers should be applied.

With increasing yields from irrigated soybean in the Midsouth, producers likely should become more aware of micronutrient levels in their soils, and be vigilant for micronutrient deficiency symptoms.

Click here and here for a detailed discussion of this topic.

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