

# MICROS

## BORON (B)

*Boron is necessary for cell division and differentiation. It helps maintain a balance between sugar and starch, and aids in the movement of calcium. Boron is also essential for the germination of the pollen grains and pollen tubes in plants and has a direct effect on yield; no pollination, no crop.*

## COBALT (Co)

*Cobalt plays a critical role in the overall growth of plants. Cobalt is necessary for the processes of stem growth, elongating the coleoptiles, and expanding leaf discs. A cobalt deficiency will reduce or stunt plant growth and reduce seed germination.*

## COPPER (Cu)

*Copper aids in root metabolism and the utilization of proteins. Copper is essential for better stalks or stems and standability. It is also key to seed coat resiliency, disease control, test weight, and seed size.*

## IRON (Fe)

*Iron is required for the formation of chlorophyll in plant cells. It activates respiration, photosynthesis, and symbiotic nitrogen fixation. Low iron levels in the plant result in poor energy transfer from leaves to growing points or fruiting structures thus slowing growth and lowering yields.*

## MANGANESE (Mn)

*Manganese is needed for phosphorus and magnesium uptake, and aids in the utilization of nitrogen, accelerating seed germination and maturity. Because it plays a major role in the production of chlorophyll, it directly affects the health of the crop and whether a plant reaches maturity or not.*

## MOLYBDENUM (Mo)

*Molybdenum acts as a catalyst in nitrate reduction, and in nitrogen transport and utilization within the plant. Molybdenum is also associated with disease resistance in plants.*

## NICKEL (Ni)

*Nickel is important in nitrogen metabolism because it is a component of the urease enzyme. Without the presence of Ni, urea conversion is impossible. It is required in very small amounts, with the critical level appearing to be about 0.1 ppm.*

## ZINC (Zn)

*Zinc is necessary for chlorophyll and carbohydrate production. High yields are impossible without zinc due to its importance in growth, metabolism and photosynthesis. High soil phosphorus, soil organic matter, biological activity, irrigation, and leaching play a role in zinc availability.*





## Where Do Micronutrients Fit?

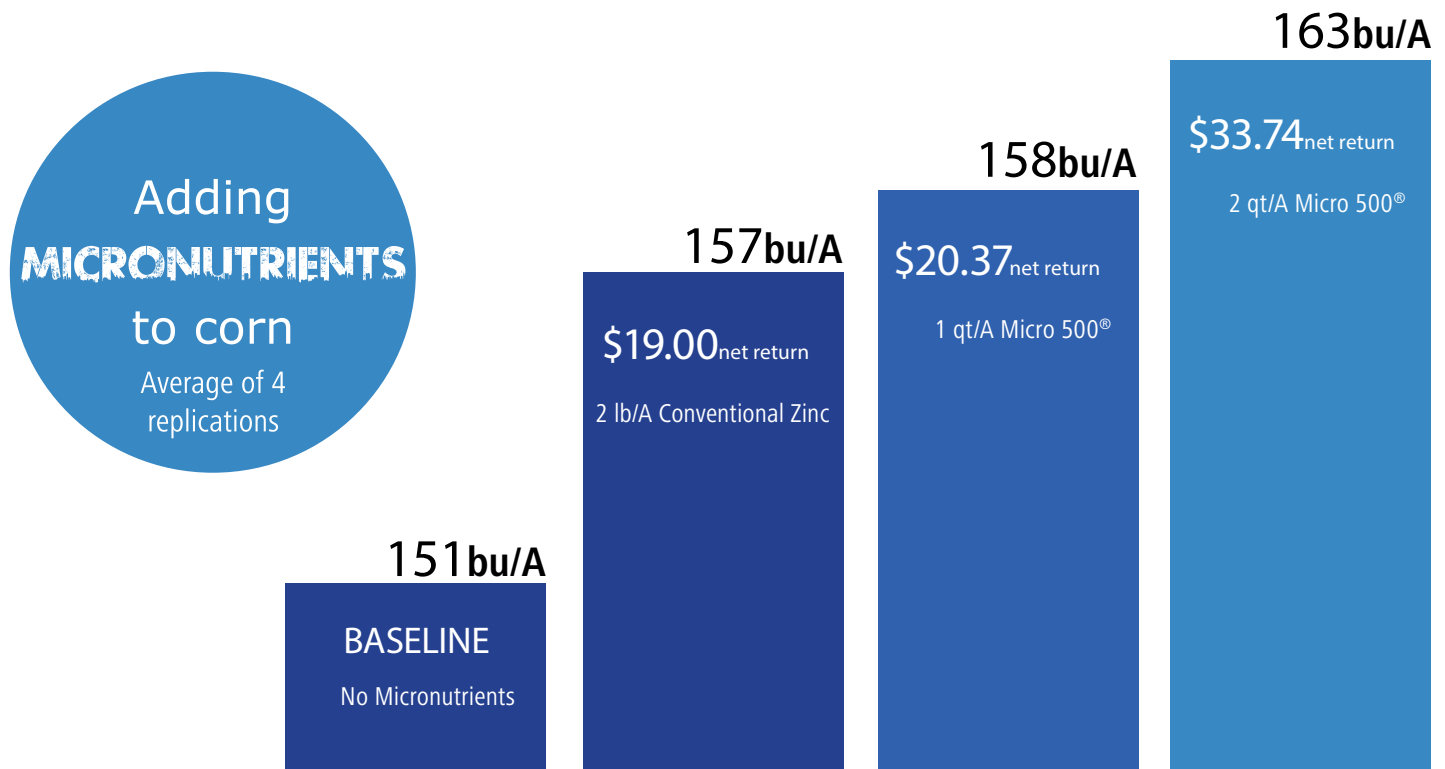
Of the essential nutrients plants must have to grow, eight are referred to as micronutrients. While plants use micronutrients in very small amounts, they are just as essential for plant growth as primary (N, P and K) and secondary (S, Ca and Mg) nutrients. Any one of them can limit growth and even cause plant death when deficient.

Micronutrient deficiencies can be difficult to recognize because they resemble other problems. For instance in corn, manganese deficiency produces yellowing, which can look like a sulfur deficiency or even be confused with nitrogen deficiency. Often tissue testing can determine the cause, but it is best to have a good soil test so any problems can be addressed ahead of seeing nutrient deficiency symptoms.

### Why are micronutrient deficiencies increasingly being seen in the soil:

- Increased yields due to various technologies means higher removal of micronutrients from the soil.
- Some micronutrients are no longer contained in high analysis fertilizers and fertilizer materials.
- Any type of land preparation which results in the removal of several inches of topsoil can result in a deficiency of certain micronutrients on the cut areas.
- High phosphorus levels can induce micronutrient deficiencies.

*(Midwest Laboratories Agronomy Handbook)*



*Micronutrients applied in addition to 4 gal/A Pro-Germinator® + 6 gal/A Sure-K® (IF); Zinc Oxysulfate was broadcast applied; liquid micronutrients applied with planter fertilizer. All plots were side-dressed with 35 gal/A High NRG-N™.*

Source: North Central Research Station, St. Johns, Michigan. \*Net return is based on yield increase compared to the baseline treatment minus the cost of fertilizer treatment outlined in each comparison. Corn price used for this calculation was \$3.50/bu and fertilizer prices were estimated regional average retail prices. If you have any questions about soil testing and developing a crop nutrition program, contact an AgroLiquid Retail Partner, Sales Account Manager, or Field Agronomy Manager.