



CERTIFIED
CROP ADVISER

Micronutrient Use in High-Yield/ High Profit Environments

by Ken Brett, CCA-ON

We're all very well aware on the current situation being faced by crop farmers everywhere. Yields continue to increase through advancing genetics and better management in every aspect of crop production. Crop prices remain at relatively high levels in comparison to long-term averages, thus profitability levels remain high with most crops. The downside of these boom times is that land costs have skyrocketed, therefore extreme attention to detail must be practiced in growing crops as fixed costs rise. One area of the fertility component of cropping systems that continues to be overlooked is the importance of micronutrients in cropping systems.

Essential micronutrients for crop growth include, Zinc (Zn), Manganese (Mn), Copper (Cu), Boron (B), Molybdenum (Mo), Iron (Fe). As the name implies, these elements are utilized in very small amounts by crops, however an excess or shortage of any of them can have a major impact on crop yields. I've often compared crop production to an automotive assembly line, in the context of regardless of how small and seemingly insignificant a missing part seems, its shortage can grind the entire production process to a halt.

Diagnosis: Good soil sampling and interpretation by a Certified Crop Advisor provide an excellent starting point to initiate micronutrient applications. A complete soil test provides actual levels of the individual micronutrients and a qualified advisor can guide growers as to how they should be applied to each crop in the rotation. Tissue sampling of the crop during the growing season gives a snapshot in time of the status of all nutrients in that crop and can indicate deficiencies before they become visible. Usually by the time a nutrient deficiency is visible to the human eye, there has already been a serious toll on the yield potential of the crop. Thus tissue sampling is a more proactive approach to managing micronutrients.

Soil Interactions: Soil pH, Organic Matter levels, soil type and levels of macro and secondary nutrients can also impact the availability of each micronutrient in the soil. At soil pH's of over 7.5, the relative availability of Zn, Mn, Cu and B declines substantially. When soil pH dips below 6.0, Mo becomes very limited in availability. High Organic Matter levels can tie up Zn, Mn and Cu while low levels can also inhibit their availability. Finer textured clay soils are prone to Mn deficiency, while on the coarser sand soils Zn, Mn and B problems are common. The impact of high soil phosphorus levels on Zn and Mn

availability is well documented in Ontario, and often Zn is added to corn starter fertilizers when phosphorus levels are known to be high.

Crop Response: Certain crops need certain micronutrients more than others. For common Ontario crops the most usual micronutrients to first look at in each situation are: Corn – Zinc, Soybeans – Manganese, Cereals – Manganese and Copper, Alfalfa and Canola – Boron.

Climatic Conditions: Extremes in weather patterns can impact availability of certain micronutrients as well. The most obvious example in Ontario of this is watching alfalfa crops become Boron deficient as the soil they are growing on becomes dryer. As the lighter soil types of an alfalfa field become impacted by drought, the crop takes on a yellowish-white color with the onset of Boron deficiency. The reason behind this is due to the fact that Boron is a water-soluble micronutrient, and as soils dry out the Boron cannot reach the alfalfa roots with the flow of the soil solution.

Economics of Micronutrient Applications: As the cash outlay for growing certain field crops can now approach or exceed \$700/acre, there has never been a more important time to ensure the micronutrient component of the crop nutrition program is correctly in place. Many common micronutrient issues can be addressed for less than \$10/acre. Canola trials replicated 26 times in Ontario from 2009-2011 showed that an investment of around \$5.00/ac of Boron returned an average of \$19.00/ac in extra yield. This past summer, I witnessed many tissue tests from both corn and wheat crops show low Boron levels and recommended an application of foliar Boron that was less than \$3.00/ac. This cost is minuscule in relation to the high overall costs of growing a high yielding crop.

Use Proven Products: These good times in crop farming seem to be bringing many new and unproven wonder products into the marketplace. As the old adage claims, "if it sounds too good to be true, it likely is" implies, be cautious with investing much of your input dollars in these goods. Good products are backed by reputable companies and supported with replicated data and customer assistance. Work with your Certified Crop Advisor in determining where your money is best utilized in maximizing yields and profitability on your operation.

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There are over 500 Certified Crop Advisers (CCA) in Ontario. Each CCA has demonstrated their knowledge about Ontario crop production by passing the required exams. In addition, they have the crop advisory experience, the education, the commitment to continuing education and have signed a comprehensive code of ethics, which places the grower's interests first.

This industry driven program helps ensure that Ontario crop producers are well served by those providing their crop production advice. This article was written by one of those CCA's.

