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Foliar Fertility – Science not Snake Oil

by Ben Dalglish, CCA

Foliar fertilizers are a topic of much debate in agriculture, and often have a polarizing effect with many farmers and agronomists, being either a firm believer or staunch skeptic about their benefits. The last few years of high commodity prices have given the foliar fertilizer industry a much needed opportunity to expand their market from high value horticultural crops, into row crops in a big way.

With this increase in on-farm usage and experimentation has come with as many questions as answers to the best management practices of foliar fertilizing.

There are a number of reasons for this, not the least being the wide variety of products that are currently available. In addition, other abiotic and biotic factors will change what product is going to perform best, particularly water stress and its huge effect on the uptake and mobility of nutrients that are mainly taken up by the plant through mass flow (N, Ca, Mg, S, Cu, B, Fe, Mn, Mo).

The use of soil and tissue testing can help narrow down the nutrients that are the primary limiting factors to yield, however, there is still much that isn't known about the optimal tissue levels and ratios of plants, as these values will change with the plant's developmental stage. Boron is a great example of this. We know that our extraction methods for boron aren't as accurate as most scientists would like and the plant's demand for boron will change depending on species, and developmental staging (plants need more boron for reproductive tissue development compared to vegetative growth). Knowing the timing of maximum demand for a nutrient is key to ensuring maximum returns on any foliar fertilizer. For example, potassium demand in soybeans occurs mainly during the reproductive period – making a foliar K application during this period more beneficial than it would be during vegetative growth.

The other point of contention is the relative cost per unit of nutrient compared to the soil applied fertilizers. While it is true that the

soil applied fertilizers provide a cheaper per nutrient unit price, foliar fertilizers can often be much more efficient in uptake into the plant of those nutrients. Phosphate is a great example of this, with foliar applied P being very available compared to soil P – up to 20 times more available, depending on the crop and soil characteristics.

There has been far less research done on the benefits of using foliar fertilizers and a differentiation in product technologies than there has been in the other more keystone agricultural inputs, like seed, soil applied fertilizers, tillage, fungicides, etc. This lack of research combined with the changes in CFIA product registration requirements no longer needing efficacy data may add further confusion to the marketplace. The one key point to take home is, not all foliar fertilizers are created equal. There are a number of formulation technologies available on the market and these truly are a more important factor to look at than nutrient analysis when selecting a product to use. To simplify the market there are two camps of product formulation – salts and chelated/complexed products.

Salts are often characterized as cheaper, high analysis products. The downside of salt based formulations is that the nutrients are present as positively charged ions in solution, and this seriously limits its potential to be transported into the plant as the leaf surface of plants are negatively charged and will bind the nutrients to the leaf surface.

Chelated/complexed products are more plant available as the process of chelation creates a neutral charge around the nutrient ion. There are a number of different chelation technologies on the market, and they vary in both price and efficacy, and compatibility - making the process of researching what product is best for your farm operation more complicated and important. Your local CCA's are a great resource to help select what is the right product, at the right time for your crop.

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