CROP EXCELLENCE

MANGANESE OPTIONS FOR SOUTHEAST CROPS, MORE IMPORTANTLY, WHY!

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As a father of four kids, you always are taught not to have favorites. However, as a plant physiologist / pathologist I have to come clean.....Manganese is the one as far as micronutrients goes for me. Manganese is a rock star in the crop production world when fully appreciated and often under-utilized because of conventional approaches to plant nutrition as dictated by establishment "rules"

To fully appreciate my approach, you have to discard the conventional wisdom associated with micronutrient essentials – to identify a deficiency might make a good agronomist, grey spot in oats and marsh spot in peas (seen both and prescribed accordingly) but to be an outstanding agronomist and service provider you will hope to never see a nutrient deficiency! Once seen, a deficiency means yield is lost forever. In many instances, the twilight zone of visual to temporary (transient, non-visual) symptoms is a fine line and maximal crop production is compromised just as with visual symptom appearance.

CAUTION: most soil and tissue tests can be a guide but are often poorly calibrated to advise on modern genetics and crop production practices. Use sense, local history and more importantly knowledge of genetic traits to provide solid field advice.

Physiological and chemical considerations

Manganese is a micronutrient beast! Often behind the scenes and not fully appreciated – sounds like one of the younger kids!! Figure out how to get the best of the kids and you'll be a hero.

I prefer to think of manganese in both chemical (the biggest moderator) and constitutive (structural) roles – both are essential for plant growth and health

Constitutive: Manganese is a key element for synthesis of liqnin and cell wall compounds. As such, Mn maintains plant growth and root strength – both essential for maximal nutrient absorption and structural resilience (disease resistance, drought tolerance and optimal growth characteristics) i.e. overall plant health and environmental (stress) tolerance.

Chemical

This is where Mn gets its rock star status... some considerations:

- Multiple oxidation states. In simple terms, alters states of chemicals and other nutrients for optimum absorption, not least calcium and magnesium
- Key contributor in energy transfer reactions such as photosynthesis and stress reduction
- Essential for multiple enzyme actions to include:
  - Herbicide detoxification and resistance in cotton, soybean and peanuts
  - Disease resistance – phytoalexin and lignin synthesis for example
  - iProtein and carbohydrate synthesis
  - Hormone synthesis to control cell division, root and fruit (pods, bolls) growth
  - Quality considerations such as micronaire in cotton, pod retention in beans and pegging / pod set in peanuts are all nutritionally mediated, in turn mediated by physiologically adequate Mn levels for the most part

How to apply Manganese?

This can be a tough one but modern foliar formulations such as Crop Excellence® Mn Xtreme® resolve these problems very well. Manganese is very biologically active and chemically active so application techniques need to be designed accordingly for optimal soybean, cotton and peanut production. Failure to do so will result in chemical incompatibility and poor nutrient absorption at critical times.

Chemical compatibility

Mn is a very reactive metal and in most herbicide mixes will de-activate the herbicide is mixed as a naked salt. Certain chelates and complexes might help but are invariably at an incompatible solution pH. Crop Excellence® Mn Xtreme® is specifically designed and formulated to optimize tank mixability yet maintain the efficacy of the partner pesticide molecule(s)

Delivery system for the plant

Crop Excellence® Mn XTreme® is an industry leading foliar formulation to ensure maximum manganese delivery to the plant. Fast absorption, translaminar and translocation characteristics are all built in to this unique formulation, proven over thousands of acres across the U.S.