

Department of Soil and Crop Sciences

1170 Campus Delivery
Fort Collins, Colorado 80523-1170

(970) 491-6517

FAX: (970) 491-0564

www.colostate.edu/Depts/SoilCrop/

MEMO

TO: AAPFCO representatives

FROM: Dwayne G. Westfall, Professor



SUBJECT: Claims of high efficiency micronutrient fertilizers

DATE: February 16, 2007

The fertilizer industry has expressed concerns to me regarding the marketing and labeling issues that have created confusion and concerns among fertilizer producers, ag-retailers, and growers. The essence of this issue is that some micronutrient fertilizers are being marketed and sold based on claims of greater efficiency of such magnitude that only a small fraction (one-fifth to one-tenth) of the micronutrient recommended will satisfy the plant's need. I have been conducting research on the efficacy of zinc fertilizers for several years. My research has been limited to zinc but I believe the results would be applicable to most cation micronutrients.

Our research has been peer reviewed and published in scientific journals as well as CSU Agricultural Experiment Station publications. A list of references is shown below. We have evaluated a range of products, but not all that are on the market, that would be unpractical. We consistently find that the ability of zinc fertilizers in supplying zinc to the plant is directly related to the water solubility of the product. Those products that have low water solubility, like zinc oxides and low water solubility industrial by-products, show very little ability to deliver zinc to the plant, over the short time period or over the long time period, particularly in alkaline soils. These results are substantiated in the publications cited below.

Based upon my research there is no "silver bullet" when it comes to zinc fertilizes. A pound of available zinc is a pound of available zinc, regardless of its source. The agricultural industry has an obligation to supply fertilizers to the consumer based upon scientifically proven principles. I believe that products that claim high efficiency advantages should be required to prove their label claims based upon independent, unbiased, peer reviewed, published scientific results. This is the essence of the fertilizer labeling law in most states.

Related publications:

Amrani, M., Westfall, D.G., and Peterson, G.A. 1997 Zinc plant availability as influenced by zinc fertilizer sources and zinc water-solubility. Tech. Bull. TB97-4. Agric. Exp. Stn., Colo. State Univ., Fort Collins, CO.

Amrani, M., Westfall, D.G., and Peterson, G.A. 1999. Influence of water solubility of granular zinc fertilizers on plant uptake and growth. J. of Plant Nutr. 22:1815-1827.

Gangloff, W. L., D. G. Westfall, G. A. Peterson and J. J. Mortvedt. 2000. Availability of organic and inorganic Zn fertilizers. Tech. Bull. TB00-1. Agric. Exp. Stn., Colo. State Univ., Fort Collins, CO. <http://www.colostate.edu/Depts/AES/Pubs/pdf/tb00-1.pdf>

Gangloff, D. G. Westfall, G. A. Peterson, and J. J. Mortvedt. 2002. Relative availability coefficients of organic and inorganic Zn fertilizers. *J. of Plant Nut.* 25: 259-273.

Westfall, D. G., J. J. Mortvedt, G. A. Peterson, and W. J. Gangloff. 2005. Efficient and environmentally safe use of micronutrients in agriculture. *Comm. Soil Sci. Plant Anal.* 36: 169-182

Gangloff, W. J., D. G. Westfall, G. A. Peterson, and J. J. Mortvedt. 2006. Mobility of organic and inorganic zinc fertilizers in soils. *Comm. Soil Sci. Plant Anal.* 37: 199-209.

Shaver, T. M., D. G. Westfall and M. A. Ranoghi. 2007. Zinc fertilizer availability and its effect on zinc bioavailability over time. *J. Plant Nutr.* 30:1-11.