EVALUATING MICRONUTRIENT SOIL AND TISSUE ANALYSIS FOR CORN AND SOYBEAN IN ILLINOIS AND WISCONSIN

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ABSTRACT

The prevalence of micronutrient fertilization in corn (Zea mays L.) and soybean [Glycine max (L.) Merr.] has increased in the North Central region despite a lack of consistent evidence supporting yield response or recent calibration of soil and tissue analysis to guide management. Two projects in Illinois (10 sites) and Wisconsin (9 sites) evaluated corn and soybean micronutrient management with objectives of (1) soil and tissue micronutrient correlation with yield response and (2) compare interpretations between routine micronutrient soil test methods. Preliminary analysis of 72 unique soils suggest strong relationships between existing and current soil analyses for some nutrients, reinforcing their potential use as high-throughput alternatives: Zn (r^2 = 0.96-0.98; 0.1 N HCl Zn, DTPA, & Mehlich-3), Cu (r^2 = 0.93; DTPA & Mehlich-3), and B (r^2 = 0.82; DTPA-sorbitol & Mehlich-3). Poor relationships were observed between DTPA and Mehlich-3 with 0.1 N H_3PO_4 Mn and hot-water B methods, alluding to the necessity of separate calibration with crop yield responses to update soil analysis framework. Corn and soybean yield response to specific micronutrients were inconsistent with soil analysis only providing moderately clear interpretation for predicting zinc response in corn and soybean.