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Investigating the role of metal enzymes in biosynthesis of protein and fatty acids by application of trace elements

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The present study is part of our ongoing investigation to study the role of trace elements on the effect on soybean seed composition. This was conducted to study the effects of five trace elements. (Mn, Cu, Zn, Mo and B (mainly chlorides except Mo as oxide, and B as boric acid)) alone and in combination with the chelating agent citric acid (CA) on soybean seed protein, oil, and fatty acids soybean cultivar (Bolivar with maturity group V) was grown in a repeated greenhouse experiment in a randomized complete block design. The compounds were applied in a combination of the chelating agent CA and the trace element (example, Mn+CA) to three- week-old soybean plants at V3 (vegetative) and at R3 (beginning of seed pod initiation) stages. The plants were allowed to grow until maturity under greenhouse conditions. The harvested seeds were analyzed for mineral, protein and fatty acid contents. The effect of the above treatment on seeds mineral was published in 2015. Results of the seed protein oil and fatty acids will be discussed in this presentation. Briefly, Mn, Cu and B treatments increased protein. Zn, Mo, Cu + CA, B + CA decreased the protein. Zn, Mo, CA, Cu+CA, Zn+CA, Mo+CA and B+CA increased the oil Mn, Cu decreased the oil. The Cu and B treatments increased the oleic acid (18:1) by 8.0 and 7.4%, respectively. Treatments, Mn, Mo, CA, and combo treatments Mn+CA, Cu+CA, Zn+CA, Mo+CA and B+CA all decreased oleic acid (18:1) by 0.6 to 14.4%. Cu, Zn, Mo, B, CA, Mn and in combination with CA increased linoleic acid by 1.3 to 6.5 %. Our goal is to identify the elements that would make desirable changes in the composition of the soybean seeds.

Biography

Goli Mudlagiri B has done his PhD in Chemistry. He is teaching economically challenged poor neighborhood kids of delta, Mississippi. His academic interest is in multi-disciplinary areas: Nuclear power plant and in Plutonium plant (BARC, India), other areas of expertise are organic synthesis/ organo-metallic, analytical, medicinal chemistry, nuclear waste disposal. He had the opportunity to discover a novel method for removing gadolinium from heavy water, Aiken, SC.

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