RegenPGC Graduate Education Community

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Does sulfur application influence the economic optimum nitrogen rate of corn in Iowa?

Abstract Sulfur (S) plays a critical role in corn production, yet its availability in agricultural soils in the Midwest has declined due to reduced atmospheric deposition and increased crop yields. This study aimed to (i) determine whether sulfur fertilization consistently enhances corn grain yield across different environmental conditions in Iowa, (ii) assess how supplemental S influences the corn grain yield response to nitrogen (N) fertilization, and (iii) evaluate whether higher N rates in modern corn systems induce S deficiency symptoms. Field experiments were conducted in 2025 at six locations across Iowa using a split-plot design, with five S rates (0, 11, 22, 34, and 45 kg S ha^{-1}) as main plots and eight N rates (0, 84, 168, 196, 224, 252, 280, and 336 kg N ha^{-1}) as subplots. Preliminary results from three of six locations indicate that S fertilization had no significant effect on corn grain yield or the N response curve. Furthermore, the S application, regardless of the rates, did not influence the N rate required to achieve the economic optimum yield. Further evaluation across all sites will continue to assess the conditions under which S fertilization may enhance N use efficiency and corn productivity in Iowa.

Dorissant, Larousse, Roth, Richard, Yakubu, Adam, **Diop, Alioune** & Ludolph, Alex. (2025, November 10). Does sulfur application influence the economic optimum nitrogen rate of corn in Iowa? [Abstract]. CANVAS 2025, Salt Lake City, UT, United States. https://scisoc.confex.com/scisoc/2025am/meetingapp.cgi/Paper/167830