

MAIZE RESPONSE TO NITROGEN AND SULFUR FERTILIZATION RATES

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ABSTRACT

Due to reduced atmospheric deposition and advancements in agronomic management, sulfur (S) deficiency has become an increasing concern in maize production systems. Because S plays a fundamental role in nitrogen (N) metabolism, S availability may influence maize yield response to N fertilization. This study evaluated maize response to N and S fertilization rates across six locations in Oklahoma. Field experiments were conducted using a randomized complete block design with 14 treatments and four replications per site. Nitrogen was applied at six rates (0, 45, 65, 85, 105, and 115% of estimated yield goal), while S was applied at 0, 10, or 20 lb S ac⁻¹. Grain yield responses were primarily driven by N application, with significant positive responses observed across environments ($\alpha = 0.1$). In contrast, S fertilization resulted in minimal and inconsistent yield responses. The addition of S did not consistently alter N response curves or significantly increase yield at most locations. Significant yield increases associated with a S application were observed only at the highest N rate at two sites. Weak correlation between S treatments and grain yield suggests S was not a yield-limiting factor under the evaluated conditions. Environmental conditions during the growing season, including above-average rainfall and warm temperatures, likely enhanced in-season nutrient mineralization. These are preliminary findings, continued research during the 2026 growing season will further evaluate the consistency and significance of the observed responses.