

Article title	Optimizing sulfur fertilizer application rate for profitable maize production in the savanna agroecological zones of Northern Ghana
Topic Keywords	Sulphur, Maize, Nitrogen
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Abstract	<p>Although several studies have established the importance of sulfur (S) in increasing maize productivity in the savanna agroecological zones (AEZs) of northern Ghana, the economically optimum S application rate is still unknown. In a two-year study at eight locations across the AEZs, we determined the economically optimum S application rate for S-deficient soils. We compared eight S application rates, ranging from 0 to 70 kg ha<sup>-1</sup> at 10 kg intervals, for optimal maize productivity and profitability. The study identified 30 kg S ha<sup>-1</sup> as the minimum rate that resulted in a plant tissue S concentration above the critical level of 0.15%. Although increasing the S application rate resulted in increases in maize grain yield, application of S beyond a rate of 30 kg ha<sup>-1</sup> resulted in increases in maize grain yield that were not statistically significant and leveled off at 50 kg S ha<sup>-1</sup>. Application rates <math>\geq 50</math> kg ha<sup>-1</sup> resulted in a high proportion of the applied S not taken up by the plant and, thus, subject to losses from the soil. Based on agro-input prices at the local level and the farm-gate prices of maize, the greatest potential profit resulting from S application was observed at 30 kg S ha<sup>-1</sup>, with a projected average maize yield of between <math>\sim 4.2</math> and 5.3 Mg ha<sup>-1</sup>, representing &gt;90% of the observed yield with the highest S application rate of 70 kg ha<sup>-1</sup>. Thus, we conclude that, for sustainable and profitable maize production in S-deficient soils of the savanna AEZs of northern Ghana, an S applications rate of 30 kg ha<sup>-1</sup> is economically justified.</p>
Link to the actual article	<a href="https://doi.org/10.1080/01904167.2022.2063740">https://doi.org/10.1080/01904167.2022.2063740</a>
Publication date	2022-04-15