

Article title	Mineral fertilizer management of maize on farmer fields differing in organic inputs in the West African savanna
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Abstract	<p>Maize grain yield and response to N (0, 50, and 100 kg ha⁻¹) and P fertilization (0, 15, and 30 kg ha⁻¹) were determined for fields differing in history of organic inputs of four farmers in the Sudan savanna zone of northern Togo over a period of 3 years. Each farmer selected a field that had benefited from long-term organic inputs close to his family homestead ('infield') and another field receiving considerably less or no organic inputs ('outfield'). Soil organic C content was 13.4 g kg⁻¹ for infields and 6.3 g kg⁻¹ for outfields. Maize yields on infields were consistently 1.0–1.5 t ha⁻¹ higher than on outfields with and without fertilizer. N was the major limiting yield nutrient in this study. Phosphorus had only a minor, and in most cases, non-significant effect. Average recovery fractions of applied N fertilizer (RFN) were significantly ($p = 0.01$) higher on infields compared to outfields over 3 years (0.41 kg kg⁻¹ versus 0.33 kg kg⁻¹). However, the agronomic efficiency of applied N (AEN) was similar over three years (19.0 kg grain kg⁻¹ N). The greatest differences between outfields and infields were observed in 2001, due to low and erratic rainfall. In that year, gains of infields over outfields were highly significant in terms of maize yield (from 0.8 to 2.0 t ha⁻¹), RFN (from 0.21 to 0.33 kg kg⁻¹), and AEN (from 9.4 to 14.4 kg grain kg⁻¹ N). Highest N recovery rates were consistently obtained on infields using 50 kg N and 15 kg P ha⁻¹. Results indicate that judicious use of mineral fertilizer (i.e., taking into account the indigenous soil nutrient supplying capacity and targeting yield levels below 80% of climate-determined yield) should be promoted on relatively fertile infields rather than on poorer outfields. This strategy would lead to reduced production risk in years with low rainfall, higher fertilizer recovery, and increased productivity.</p>
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