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## Production Potential of Dry Season Maize in an Inland Valley in Central Uganda

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### Abstract

Maize is the main food staple in East Africa contributing over 50 % of total calories consumed. A shortage of maize causes food insecurity. Inland-valley wetlands with enhanced soil moisture than surrounding top-lands provide opportunities for growing off-season maize. We assessed the potential of an inland-valley in central Uganda for producing dry-season maize. Two consecutive field experiments were conducted in three hydrological zones (fringe, middle and centre) under different nutrient management options. Average grain yield in the inland valley ( $3.8 \text{ Mg ha}^{-1}$ ) exceeded the national production average of upland maize by 60 %. Grain yield was high at  $5.0 \text{ Mg ha}^{-1}$  and more stable in the centre of the inland valley and clearly lower at  $3.2 \text{ Mg ha}^{-1}$  in both the middle and fringe. There was a seasonal influence on the production capacity of different hydrological zones. During the short dry-season with more rainfall, the centre produced about 25 % higher grain yield ( $6.3 \text{ Mg ha}^{-1}$ ) than the fringe and middle. In the long dry-season with less precipitation, grain yield in the centre ( $3.6 \text{ Mg ha}^{-1}$ ) was lower, but still about 50 % higher than yield in other hydrological zones. Grain yields were highest with  $120 \text{ kg ha}^{-1}$  inorganic N fertiliser, but similar to yields with  $120 \text{ kg ha}^{-1}$  organic N supplied by chicken manure ( $60 \text{ kg N ha}^{-1}$ ) and green-manure ( $60 \text{ kg N ha}^{-1}$ ). Irrespective of the source,  $60 \text{ kg N ha}^{-1}$  did not produce a noticeable yield advantage over the unfertilised control. According to our results, maize cultivation can be restricted to the centre during the dry-season with less expected rain, and expanded to the fringe and middle positions in the dry-season when more rain is expected. A low-cost fertiliser combination of green manure and chicken manure can sustain maize productivity in the inland valley.

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