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 Mg ha⁻¹) exceeded the national production average of upland maize by 60%. Grain yield was high at 5.0 Mg ha⁻¹ and more stable in the centre of the inland valley and clearly lower at 3.2 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 Mg ha⁻¹) than the fringe and middle. In the long dry-season with less precipitation, grain yield in the centre (3.6 Mg ha⁻¹) was lower, but still about 50% higher than yield in other hydrological zones. Grain yields were highest with 120 kg ha⁻¹ inorganic N fertiliser, but similar to yields with 120 kg ha⁻¹ organic N supplied by chicken manure (60 kg N ha⁻¹) and green-manure (60 kg N ha⁻¹). Irrespective of the source, 60 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.

Keywords: Climate change, East Africa, food security, wetlands

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