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Grain Yield Response of Maize Varieties to Intercropping with Cassava and Fertiliser in DR Congo

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Abstract

Maize and cassava are the major food crops in DR Congo. Intercropping is a common practice, yet has not received sufficient research attention to establish if there are compatibility issues between varieties of the two species. Since the arrival of the cassava mosaic (CMD) pandemic cassava varieties have been changed to CMD resistant ones. The Congolese national system has continued breeding maize and released several new varieties. Thus little is known about these varieties' ability to synergistically intercrop. This study investigates three maize (Mus, short straw yellow grain 90 to 100 days to maturity (DTM); QPM1 a high protein quality variety, short straw, white grain 90–110 DTM; and QPM3 a high protein quality variety, short straw, white grain, stay green 90–100 DTM) and three cassava varieties, RAV a first generation CMD tolerant, branching variety; Lueki, a later developed CMD resistant branching variety; Obama, a CDM resistant, erect, non-branching variety intercropped and mono-cropped with and without fertiliser in 6 sites across DR Congo. Three sites were on sandy grassland soil, 2 on sandy soils after bush and tree fallow and 1 on valley bottom clay soil dominated by *Pennisetum purpureum*. Here only maize yields are reported. Maize yields were significantly different between all sites. Monocrop maize yielded more (1.7 Mg ha^{-1}) than when intercropped with Obama and Lueki (1.4 Mg ha^{-1}) yet not when intercropped with RAV (1.6 Mg ha^{-1}). However, maize yield had a site × cassava interaction: in three savannah sites on sand soil no differences between maize varieties was found, in a site on clay the monocrop maize out/yielded all intercropped treatments by 1 Mg ha^{-1}; on 2 sites established after bush or tree fallow the maize yielded highest when intercropped with cassava variety RAV. Across sites the maize yields did not differ between maize varieties. Fertiliser application increased yield by 50 % from 1.2 to 1.8 Mg ha^{-1}. Fertiliser response was site dependent, ranging from 0.38 to 0.85 Mg ha^{-1} and from 30–260 %. Highest yields were attained on sand soil after tree fallow reaching 5 Mg ha^{-1}.

Keywords: Cassava, fertiliser, intercrop, maize

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