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“Filling gaps and removing traps
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Validating a Decision Support Tool for Cassava Maize Intercropping in Southern Nigeria

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Abstract

Cassava is a major staple food in Nigeria and often intercropped with maize and/or other crops. However, average yields in Nigeria are low, about 10 t ha⁻¹. Thus, farmers request advice on improving cassava-maize cropping. Based on more than 150 researcher and/or farmer managed trials, planted in 2016 and 2017, in Anambra, Benue, Cross River, Ogun and Oyo states, we developed a first version of a decision support tool (DST). It advised on simultaneous planting of both crops, variety choice (erect growth type for cassava and early maturing maize varieties (90 to 95 days), planting density (12500 cassava plants ha⁻¹, 40000 maize plants ha⁻¹) and fertiliser application. The height of the previous maize crop was a proxy for soil fertility. Through statistical modelling, we estimated the number of additional maize ears due to fertiliser application. Fertiliser was recommended when the expected income from the additional maize was twice the estimated fertiliser cost. In 2018, farmers and their extension agents planted 143 validation trials in all 5 states. The extension agent used the DST to derive a specific recommendation. Next, they implemented, 3 plots, testing fertiliser application and maize planting density. Based on the maize harvest from 109 fields, we evaluated the performance of the DST. In 45 % of the cases, we gave a correct recommendation, for 19 % it was wrong with added costs for the farmer (NB: input costs were borne by the project). In 36 %, the recommendation was too conservative: the farmers missed the opportunity of additional profit through fertiliser application. Maize height alone was a poor indicator that was difficult to handle for farmers who use a range of different varieties. Thus, the current revised version of the DST advises planting maize at high density only at sites of high soil fertility or when fertiliser application is recommended. Fertiliser recommendation is coupled with an assessment of height and appearance (including greenness) of a would-be maize crop without fertiliser, fertiliser costs, price expectations for the maize produce and the farmer's risk assessment of the investment into fertiliser.

Keywords: African Cassava Agronomy Initiative (ACAI), agronomy, fertiliser, growth duration, planting density, risk, variety choice