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Breeding un-sweetpotato for West Africa: Progress on population development and improvement in Ghana and Peru

E.E. Carey[1,6], F. Diaz[2], E. Owusu-Mensah[3], E. Obeng-Bio[1], V. Oduro[4], J.N. Asafu-Agyei[5], W. Grüneberg[2]

[1]International Potato Center (CIP), c/o CSIR-CRI, Kumasi, Ghana; [2]CIP, Lima Peru; [3]Department of Food Science and Technology, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana[4]; Biotechnology and Nuclear Agricultural Research Institute, Accra, Ghana; [5]CSIR-Crops Research Institute, Kumasi, Ghana;

Abstract

Sweetness of sweetpotato is considered to be a significant constraint to demand for this crop in West Africa where starchy staple root crops with low flavor impact are important. Un-sweetpotato populations and varieties which may have use both for fresh consumption and in processed forms are therefore under development at the Sweetpotato Support Platform for West Africa, and drawing on a global genetic resource base at CIP headquarters in Lima, Peru. In Ghana base populations were assembled from locally adapted regional germplasm, including released varieties, farmers' varieties, breeding lines from IITA reported to be un-sweet, and from exotic germplasm reported to be un-sweet. Seed populations were also introduced for assessment from Sweetpotato Support Platforms in Uganda and Mozambique, and from Japan and the USA. Introduced germplasm was evaluated in field trials in production zones/agroecologies where sweetpotato is important in Ghana, and farmers participated in selection based on field performance and taste. Sugars of raw samples were measured using near-infrared reflectance spectrometry, and cooked samples were tasted to assess sweetness. In Peru, a large breeding population was screened for un-sweet taste (low flavor impact) and these materials, presumed to be Beta-amylase nulls, were crossed with a population of breeding lines developed at IITA and presumed to have good adaptation to West African conditions. Seed from the Peruvian crossing block has been sent to Ghana for evaluation and selection. Together, West African and exotic populations are expected to provide a solid foundation for developing un-sweetpotato and for expanding the range of options available to sweetpotato producers and consumers in West Africa and elsewhere.

Key words: NIRS, amylase, breeding, sensory quality