Tropentag, September 17-19, 2013, Stuttgart-Hohenheim

"Agricultural development within the rural-urban continuum"

Field Screening of Variation for Heat Tolerance in a Large Set of Sweetpotato Germplasm Accessions

Bettina Heider, Elisa Romero, Stef De Haan

International Potato Centre (CIP), Glocal Program Genetic Resources, Peru

Abstract

Sweet potato is a robust crop with a wide range of adaptation to agroecological conditions, high yield potential, low input cultivation requirements, effective vegetative propagation and high nutritive value but storage root initiation and growth is adversely affected by temperature. Improved sweetpotato varieties with increased tolerance to heat could improve productivity and allow for the use of more marginal heat prone production areas. Sweet potato landraces and unimproved genotypes represent a valuable resource for heat tolerance in breeding programmes. The International Potato Centre holds the largest *in vitro* collection worldwide of sweet potato germplasm of which only a fraction has been evaluated for heat tolerance. This vast pool for future adaptative breeding has remained fairly untapped due to the lack of necessary evaluation data. The objective of this on-going study is therefore to screen a representative collection of sweetpotato for key prioritised traits: early bulking and heat tolerance.

The poster will present the first evaluation data of a large set (1973) of sweetpotato accessions presently being cultivated and evaluated for heat tolerance in the coastal desert of Northern Peru. Due to the scale of the screening trial non-invasive optical and fast throughput methods are used to detect the effects of heat on biochemical and physiological processes. Canopy temperature will be determined by infrared thermal imaging and chlorophyll content by using a portable chlorophyll metre measuring Normalized Difference Vegetation Index (NDVI). Agronomic data (*e.g.* early bulking, storage root yield, number of pencil roots, number of marketable roots, harvest index, and dry matter content) will be recorded at harvest. It is expected that NDVI and canopy temperature are correlated to storage root yields and thus may prove to be useful tools to fast screen for heat tolerance of sweetpotato and ultimately detect existing variation in large germplasm collections.

Keywords: Abiotic stress, fast screening methods, heat tolerance, NDVI, sweetpotato, thermal imaging

Contact Address: Bettina Heider, International Potato Centre (CIP), Glocal Program Genetic Resources, Av. La Molina 1895, Lima, Peru, e-mail: b.heider@cgiar.org