Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Varietal Differences in Tuber Yield and Fertiliser Response in a F1 Mapping Population of Water Yam (*Dioscorea alata* L.)

Ryo Matsumoto, Haruki Ishikawa, Sam Korie, David De Koeyer

International Institute of Tropical Agriculture (IITA), Nigeria

Abstract

Yam (*Dioscorea* spp.) is important for food security in West Africa which produces more than 90 % of the worldwide production. Development of high-yielding varieties and varieties with abiotic stress tolerance (low soil fertility) is strongly required, and also it is one of the most important targets of the yam breeding strategy in West Africa. Although soil fertiliser management is one of the most interesting topics on the strategy, results on yam production is differently estimated. In this study, we aimed at clarifying the varietal differences in tuber yield and fertiliser response, and to select varieties with low soil fertility tolerance within a segregating *D. alata* F1 population. Ninety-four clones derived from crosses between TDa 00/00194 (female, late maturity) and TDa 02/00012 (male, early maturity) were grown under field conditions at Ibadan, Nigeria. A field study evaluated the varietal difference in tuber yield and growth period of water yam when grown with (90 kg N ha^{-1}, 75 kg K ha^{-1}, 50 kg P ha^{-1}) or without fertiliser in a field with low soil fertility condition. Growth period was calculated from sprouting date to senescence of the aerial part of each plant. The number of tubers and fresh tuber weight of each tuber produced by each plant were recorded on 15 January, 2018. A wide range of growth period and yield differences among the clones was observed within the F1 mapping population. It was possible to identify genotypes showing high yield even under low fertility soil condition. A significant interaction effect between fertilisation and variety on tuber yield was observed, and the presence of clones responding to fertiliser application was found within the trial population. Varietal differences in fertilisation response may be a factor that has contributed to variable results in previous studies. In future experiments, we plan to clarify the physiological characteristics of fertiliser use efficiency and nutrient absorption in water yam.

Keywords: Fertiliser response, low soil fertility condition, varietal difference, water yam

Contact Address: Ryo Matsumoto, International Institute of Tropical Agriculture (IITA), Yam Breeding, Ibadan, Nigeria, e-mail: r.matsumoto@cgiar.org