Proceedings published at http://www.m.elewa.org/econferenceIeCAB.php

Selection of adaptable tomato varieties for production and breeding in an era of changing climatic conditions in Nsukka, Nigeria.

Abstract ID: IeCAB011-410

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ABSTRACT

Objective: Tomato yield is relatively low in southern Nigeria during rainy season because of the present excessive rainfall and its attendant problems. The study was conducted to select adaptable tomato varieties for production and breeding in an era of changing climatic conditions.

Methodology and results: The study was conducted in a randomized complete block design with three replications and comprised of six exotic, three cultivated and one wild variety. It was designed to select adaptable varieties over two seasons for production and breeding in Nsukka. The wild variety (*Lycopersicon pimpinellifolium)* significantly ($p< 0.01$) performed higher than other varieties in plant growth and yield attributes: plant height, number of branches/plant, number of flowers / truss/ plant and number of fruits/ plant in the two seasons. The wild had a significantly ($p<0.01$) higher fruit number but lower fruit yield of 4.34 tonnes/ha in the early season because of the smallness of the fruits. Three exotic varieties: Grosso, Insulata

and Petomech had significantly ($p<0.01$) higher fruit yield of 6.44 tonnes/ha, 4.7 tonnes/ha, 5.65 tonnes/ha respectively, above other varieties in the two seasons. Insect pest and disease load on the varieties were significantly ($p<0.01$) lower in the first season probably because of the lower and evenly distributed rainfall and moderate temperature (195 mm, 26.02^{0}C, respectively) as opposed to the second season of concentrated and excessive rainfall and lower temperature (202.76, 24.89 ^{0}C respectively). The three exotic varieties that had higher yields over the two seasons and the wild showed higher adaptation to the environment above others, including the cultivated. Grosso and Insulata had significantly bigger fruit sizes while Petomech, had significantly thicker pericarp.
Conclusion and application of finding: It could be concluded that the varieties with higher fruit yield and quality and have higher adaptation could be selected for production and breeding.

Keywords: *adaptation, tomato, high rainfall, selection, high temperature*.