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Genotype by environment interaction (GXE) for native cassava (*Manihot esculenta* Crantz) starch quality and its use in the commercial sector

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Abstract. Cassava (*Manihot esculenta* Crantz) is the second most important staple food crop in Sub-Saharan Africa providing an average of 285 calories per person per day. Cassava is an important food and cash crop, and it is increasingly becoming important industrial crop in Malawi. Various cassava intermediate products are used but industries hesitate to use cassava starch because powder sold by some suppliers in the name of cassava starch failed. This study therefore was initiated to look into native cassava starch qualities from different Malawi cassava genotypes, determine the appropriate stability parameter to deal with genotype by environment interaction (GxE) for starch quality traits, and also find out the possibility of use of cassava starch by the main industries in Malawi. Trials were conducted in Malawi in 2000/01 season. Apart from starch quality parameters, root dry mater and starch extraction evaluation were also included. Various stability measures were used to deal with the problem of genotype by environment interaction. Feasibility of use of cassava starch in Malawian industries was also conducted. The results show that all the cassava genotypes produced starch with no protein just like the one used in the pharmaceutical industry. The moisture and ash content were much lower than the recommended allowable maximum. The pH for cassava starch was within the recommended range. Additive main effects and multiplicative interaction (AMMI) was strongly correlated with other stability parameters like Wiecovalence and stability variance–no covariate. AMMI is therefore recommended for use in the stability analysis of starch quality parameters since it provides additional information on appropriate environments for unstable genotypes. This study suggests that genotype has a greater influence on root dry matter than the environment. This study showed that native cassava starch can be used in the pharmaceutical, battery and packaging material making and textile industries in Malawi, however strict quality control for cassava starch is required.