EVALUATION OF SEED YIELD AND QUALITY PARAMETERS IN SOME MAIZE (*Zea mays* L.) HYBRIDS IN TWO AGROECOLOGICAL ZONES IN SOUTHWESTERN NIGERIA.

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ABSTRACT

Determination of physical and physiological characteristics in seed quality is important to crop production. However, little information exists in this aspect in some newly developed hybrids maize in Nigeria. The study assessed forty maize (*Zea mays* L) hybrids for seedling growth, seed quality (SQ) traits and seed yield (SY). The experimental fields were located in Ibadan, Oyo State and Ikenne in Ogun State. Ibadan representing Derived savannah was on 3° 56′ E; 7° 33′ N 168 m above sea level (asl) while Ikenne, a rain forest zone was located on 3^{o} 42′ E; 6^{o} 54′ N 062 m asl. The field evaluation was conducted from August to November, 2021. The field trial was laid out in a Randomised Complete Block Design with three replicates both in Ibadan and Ikenne, Nigeria. SQ assessment was done in March 2022 at the Seed Laboratory of Institute of Agricultural Research and Training Ibadan and the Laboratory of Department of Plant Breeding and Seed Technology, Federal University of Agriculture Abeokuta in a Completely Randomized Design with three replicates. SQ parameters involving germination such as number of seed planted, normal germinated seeds, total number of normal germinated seedling, seedling length, were transformed using arc-sine to get Mean Germination Time (MGT), Seedling Vigour Index(SVI) and Seedling Germination index(SGI) before analysis. Seed physical parameters such as projected area(PA), straight length(SL), curve length(CL), straight width(SW), curve width(CW), curvature(C), Surface area circle(SAC) and projected perimeter (PA) were taken. Data collected on SY and SQ were subjected to analysis of variance. The treatment means were separated using Duncan's Multiple Range Test at 5% level of probability. Pearson's correlation analysis was used to detect the association among SY and various quality parameters. The results showed highly significant differences ($p< 0.01$) in SY, seed physiological

and physical parameters of the maize hybrids. Hybrids ARTM 39, ARTM 4, ARTM 48 and ARTM 21 were the highest seed yielders with their corresponding values of 9.32 t ha^{-1}, 8.45 t ha^{-1}, 8.43 t ha^{-1} and 8.4 t ha^{-1} respectively, across locations. The seed physiological qualities showed that Hybrid ARTM 4 was superior to other hybrids. Seed physical parameters revealed that Hybrid ARTM 39 was the most superior with respect to PA, SL, CL, SW and CW. The SY significantly and positively correlated to the number of leaves (r=0.39**) at 6 weeks after sowing (WAS) (r=0.78). Similarly, seedling height (SH) had good association with mean germination time and seedling vigour index. The seedling weight (SWT) had highly significant and positive correlation with mean germination time ($r=0.33^{**}$) while SVI and SGI showed significant association with one another ($r=0.94^{**}$). There was positive association among all the traits of seed physical quality except for seed curvature. It was concluded that Hybrids ARTM 39, ARTM 4, ARTM 48 and ARTM 21 had moderate surface area circle showing good seed physical quality, physiological quality which contributed to the yield of the hybrids. The hybrids listed are therefore, recommended to the seed companies for exploration of their yield potential and their seed quality.