Screening for host plant resistance to fall armyworm (*Spodoptera frugiperda*) in selected sorghum (*Sorghum bicolor)* breeding lines using detached leaf assay in Kenya

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ABSTRACT

Fall army worm (FAW) has continued to cause significant damage in cereals such as maize and Sorghum in Kenya and other African countries. Use of FAW resistant sorghum genotypes would provide sustainable alternative strategies. To identify resistant genotypes, 16 advanced sorghum genotypes were evaluated for resistance using detached leaf bio-assay in the laboratory at Egerton University in March, 2020. Mass rearing of test insects was carried out in the insect rearing laboratory at Egerton University while sorghum test plants were raised in the green house in Kenya Agriculture and Livestock Research Organization (KALRO) Njoro. Experiment was laid out in completely randomized design and replicated three times. Data collected included larval survival rate (%), larval weight (mg), Pupation rate (%), pupal weight and adult emergence (%). Data was subjected to analysisis of variance using Statistical software (SAS) version 9.2. Statistical differences among the treatment means for all the variables were compared using LSD test at $p \leq 0.05$. Tested genotypes significantly influenced the larval weight, Pupation, pupal weight and adult emergence, after feeding the neonate larvae for eight days. Genotype did not however influence larval survival (p = 0.28). larval survival ranged between 63.3 and 100%, and weighed between 15 and 35.75 (mg). Rate of Pupation ranged between 25 and 90% while pupae weighed between 0.04 and 0.17(mg). Adult emergence rate ranged between 27.00 and 89.70%. Genotypes, GBK 000446, IS 21055, GBK 000121, GBK 000392, IESV 92022/1 SH, IESV 92042 SH consistently had low larval survival and weight, Pupation rate, pupal weight and adult emergence rate and could be resistant to fall armyworm. The larval weight positively and significantly correlated with pupation rate (r=0.66*), adult emergence rate (r=0.47*), larval survival rate (r=0.05*). Adult emergence rate also significantly correlated with Pupation rate (r=0.69*), larval survival (r =0.19*). Pupation rate positively correlated with larval survival rate (r=0.29*). Results from this study shows that larval weight and pupation, pupal weight, pupal emergence and larval survival are important traits that can be used to screen sorghum genotypes for susceptibility and resistance. More evaluations on morpho physio chemical

properties could validate the host plant resistance in selected sorghum genotypes.

Keywords: Fall armyworm (*Spodoptera frugiperda*), host plant, sorghum (*Sorghum bicolor*),