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OVERCOMING ABIOTIC AND BIOTIC STRESS CONSTRAINTS IN PLANT SCIENCE

ONLINE

THE 2030 AGENDA AND THE PATHS FOLLOWED BY THE UENF POPCORN BREEDING PROGRAM FOR SUSTAINABLE AGRICULTURE: THE INDICATION OF SUPERIOR VARIETIES AND SELECTION BASED ON EASY-TO- MEASURE TRAITS

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RESUMO

In the challenging climate change scenario, acting through genetic improvement to mitigate the harmful effects of drought on crop productivity is the most viable strategy from the point of view of agricultural sustainability. The characterization of drought-tolerant germplasm is a crucial step for this purpose. In this sense, this study aimed to characterize 15 varieties of popcorn of UENF germplasm bank, from different Latin American countries. The experiment, in randomized blocks with three replications, was carried out under well-watered (WW) and water stress (WS) conditions. The evaluated traits were: ear length (EL), one hundred grains weight (100GW), grains per row (NGR), plant height (PH), relative chlorophyll content (SPAD), dry matter (DM), grain yield (GY) and popping expansion (PE). Analysis of variance (ANOVA) was performed and the effects of the morpho-agronomic traits on two variables of interest – GY and PE – were estimated through the path analysis using the Structural Equation Modeling (SEM). Water use efficiency was estimated using the Drought Tolerance Index (DRI). ANOVA detected variability between accessions for all traits in both environments. The drought reduced GY by 30.61% mainly due to the effect of the deficit in NGR and EL. The reduction in PE was negligible, of 3.49%. Based on the SEM analysis, an option for selecting for PE in WW and WS is via EL; and for GY, via NGR or 100GW, the latter being facilitated by indirect selection via SPAD, a non-destructive and easy-to-measure method. For DRI the varieties 880POP and BRS-Angela showed the lowest percentage losses, being considered promising for environments with drought. BRS-Angela has already stood out in other studies, being a source of promising lines for conditions of low water availability, having originated one of the parents of the first national drought-tolerant hybrid registered with the

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