

Abstract

Cassava mosaic disease (CMD) and cassava brown streak disease (CBSD) are two important biotic constraints affecting cassava (*Manihot esculenta* Crantz) production in sub-Saharan Africa, and the deployment of cassava varieties dually resistant to both diseases is the most effective and realistic way of reducing losses. Crosses were carried out between a Tanzanian local cassava cultivar (Namikonga) and a South American cassava genotype (AR37-80) to develop dual-resistant progenies, and they were evaluated for two seasons at Naliendele in Southern Tanzania, which is a CMD and CBSD hot spot area. The CMD-resistant progenies had low foliar severities (≤ 1.8), similar to the CMD-resistant parent. The CBSD-resistant progenies had minimal foliar (≤ 2.0) and root necrosis (≤ 1.2) severities, similar to the CBSD resistant parent, whereas CBSD-tolerant progenies had severe foliar severities up to 3.3 but minimal root necrosis severities (≤ 1.2). Traits with minimal environmental influence also had high heritability (≥ 0.65) and high selection accuracy (≥ 0.70), and they included CMD foliar symptoms, CBSD foliar symptoms at 6 mo after planting, root necrosis, root necrosis incidence, root weight, root number per plant, and harvest index. Correlation analysis showed that the presence of disease reduces usable roots, root weight, root number per plant, and harvest index. Dual resistance can improve yield as observed in Namar 050 and Namar 371, which had high root weights of 27.5 and 28.2 t ha⁻¹ with high genetic gains of 56.1 and 58.5%, respectively. Dual-resistant progenies identified were Namar 050, Namar 100, Namar 130, Namar 200, Namar 334, Namar 371, and Namar 479, as they had minimal CMD and CBSD symptom severities (≤ 2.0) and could be used for breeding cassava varieties with superior characteristics.