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“Resilience of agricultural systems against crises”

The Use of the Musa Diversity to Address the Challenge of Climate Change Agriculture and Food Security

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Abstract

The majority of edible and cultivated bananas arose from interspecific crosses of *Musa acuminata* (A genome) and *Musa balbisiana* (B genome). Currently bananas are used as staple food crops in the tropic and subtropics and banana production systems are affected by drought, frost and flooding as results of climate change and unfortunately we are not using the diversity of *Musa* germplasm to adapt the best cultivars to address these problems. It is well established that cultivars with *balbisiana* genome are more resistant to frost than cultivars with *acuminata* genome, for example in the subtropics in Brazil Prata cultivars (AAB) are more resistant to frost than Cavendish (AAA). In Central America, cooking banana like Bluggoe (ABB) is more resistance to drought than plantain cultivars (AAB). However the farmers remain with the susceptible cultivars, although a replacement must be the solution to address these problems. Concerning to dessert banana for exporting, we are using just Cavendish cultivars (AAA), which are the most susceptible not just to drought, frost and flooding, but also to pests and diseases, such as Black Sigatoka (*Mycosphaerella fijiensis*) and the burrowing nematode (*Radopholus similis*). However there are hundreds of dessert banana cultivars, which are more resistance to biotic and abiotic stresses and can be exported, but we are not using them. Bred hybrids, such as FHIA 18 and FHIA 17 are more resistance to Black Sigatoka than Cavendish and countries like Cuba and Bolivia the farmers are cultivated them for local consumptions. In Dominican Republic, FHIA 21 (AAAB) has partial replace the black Sigatoka susceptible plantain cultivars Macho X Hembra (AAB) and the farmers are saving application of fungicides just with the use of FHIA 21. Finally it is important to use the diversity of *Musa* germplasm, not only to address the climate change effects, but also to improve the food security and nutrition of the population mainly in tropical and subtropical countries.

Keywords: Bananas, biotic and abiotic stresses, bred hybrids, germplasm, local cultivars, resistance