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Cassava: Meeting the Challenges of the New Millennium

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SP07-13 **F02**

Ceballos, Hernan; Fregene, Martin; Debouck, Daniel; Dufour, Dominique; Tohme, Joe; Sanchez, Teresa; Mafla, Graciela; Morante Nelson; and Pérez, Juan C.
h.ceballos@cgiar.org
1) CIAT, AA6713, Cali, Colombia. 2) Univ. Nacional de Colombia, Palmira, Colombia.

High-value cassava germplasm: a reality that will open markets to cassava farmers

The Global Cassava Strategy initiative identified weak markets for cassava products as a bottleneck limiting the capacity of the crop to help farmers out of poverty. Identifying or creating genetic variability to make cassava better suited to meet the needs of different industries could help overcoming this bottleneck. This article summarizes the results from traditional approaches (breeding, screening germplasm collections, inbreeding to expose recessive traits, mutagenesis and inter-specific crosses). Significant progress has been attained for different traits recently: 1) Tolerance to post-harvest physiological deterioration was introgressed from *Manihot wakerae* and perhaps found in mutagenized populations. This trait will drastically reduce the marketing costs of cassava; 2) Commercially relevant starch mutations (amylose-free and small-granule/high-amylose) have been identified through inbreeding and induction of mutations. These traits are relevant for the starch and bio-ethanol industries; 3) A group of cassava clones from the germplasm collection, with 2-3 times higher levels of proteins in the roots, has been identified. This is relevant for the feed industry and, obviously, to improve nutritional status of human populations; 4) Rapid-cycling recurrent selection has doubled the maximum level of β–carotene in cassava roots. This is important for human nutrition; for the feed industry and as example of cassava's capacity to respond to proper breeding approaches. High-value cassava is, therefore, no longer a dream but a reality that will have a positive impact not only in the livelihood of cassava farmers but in the scientific community: cassava offers a wealth of professional opportunities to young scientists.

SP07-14 **F03**

Alves[1], Alfredo; Tavares[2], Filho Leunidas; Ledo[1], Carlos; Sarmento[3], Claudia; and Santos[3], Ariana
aalves@cnpmf.embrapa.br
1) Embrapa Cassava & Tropical Fruits, Cruz das Almas, Bahia, Brazil. 2) FAPESB, Technical Assistant Fellowship, Cruz das Almas, Bahia, Brazil. 3) CNPq, Student scholarship, Cruz das Almas, Bahia, Brazil

Crossing compatibility between wild relatives and cultivated cassava

Although cassava wild species are important source of useful genes that can be used in cassava breeding programs for resistance to biotic and abiotic stresses, very few studies on crossing compatibility between wild and cultivated species have been reported. To address this issue, this work was carried out in the working collections of *Manihot* species at Embrapa/CNPMF. Nineteen crosses were performed, involving cultivars of *M. esculenta* and accessions of 13 wild species: *M. anomala, M. flabellifolia, M. jacobinensis, M. peruviana, M. tomentosa*, Pornincia (natural hybrid), *M. caerulescens, M. cecropiaefolia, M. dichotoma, M. glaziovii, M. irwinii,* Manioba (probably *M. pseudoglaziovii*) and cassava Sete Anos. The six first wild species were used in reciprocal crosses and the other seven were crossed only as female parentals. The crossing compatibility was highly genotype-dependent. Out of the 13 wild species, only 6 species produced seeds (*M. anomala, M. flabellifolia, M. jacobinensis, M. tomentosa, M. irwinii* and cassava Sete Anos). The average rates of fertilized flowers, fruit set, and seed production were significantly different among species and dependent of both donor and receptor of the pollen grains. Only two wild species produced seeds in both ways (as male and female): *M. flabellifolia and M. tomentosa*. The period from pollination to fruit dehiscence varied from 48 to 97 days and a total of 158 hybrid seeds were produced from 972 pollinated flowers.