Testing Brazilian Cassava Cultivars for FEC Production and Transformation Capacity

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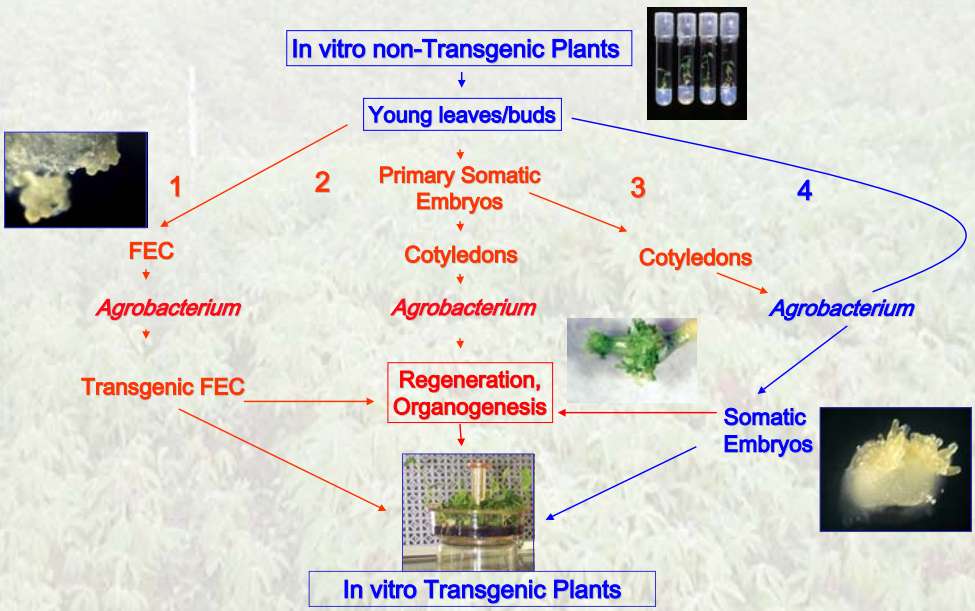
Introduction

Genetic transformation is a reality for cassava and promises to speed up the improvement of the crop in major Latin-American, cassava-growing countries like Brazil and Colombia. However, the transformation technology is limited to few cultivars, due to genotype differences. It is then necessary to select cultivars from these countries that are more suitable for genetic transformation, by testing their ability to produce embryogenic, transformable tissues, and to regenerate plants after transformation.



Materials and Methods

CBN funded a small project to bring transformable tissues, mostly somatic embryos, from eight farmer-preferred cultivars from Brazil (Água Morna-BGM365, Amansa Burro-BGM549, Aparecida-BGM123,, Milagrosa-BGM004, Rosa-BGM260, Rosinha-BGM394 e Tapicina-BGM1063), and test them in CIAT for transformation with *Agrobacteirum*. At the same time, some embryogenic tissues, from the Brazilian cultivars and few selected Colombian cultivars of cassava, were also induced to produce Friable Embryogenic Callus (FEC), the most commonly used cell system to transfer genes into cassava.

Results and Discussion

All Brazilian cultivars tested produced somatic embryos and regenerated plants, which makes them suitable for transformation using pathways 2, 3 and 4 depicted above. Only from one Brazilian cultivar, Bujá Preta-BGM146, we obtained FEC, which is in agreement with the observed percentage of Colombian cultivars that produce FEC (approx. 15%). From about 38 Colombian cultivars that have been tested for FEC production, it has been possible to reproducibly establish lines from six of them, though above 60% of them produce somatic embryos. Then , an alternative way to obtain transgenics from cultivars that do not produce FEC is by using the same pathways 2, 3 and 4. The efficiency of transformation may be compromised since in most cases it doesn't go beyond 1-2%, while with FEC one can obtain 50% or more independent transformation events (see Poster PS7-07) from few grams of tissue. On the other hand, using pathways 3 and 4 , one should expect less somaclones since the time from plant to plant is shorter. Reducing somaclonal variants, when using FEC for transformation, depends on the ability of boith, the genotype and the tissue culturist, to grow enough FEC in a short period. None of the pathways however are exclusive, and one must use the one that best fits the transformable explants available. Transformation of Brazilian cultivars is in progress. Although plants have been regenerated through pathways 2 and 3, molecular confirmation of transgenesis is pending.

Reference: Taylor et al (1996) Nature Biotechnol 14:726-73