

A UK banana transformation capability for developing countries: Applications

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Banana (*Musa* spp.) is the number one fruit crop in the world. Approximately 90% of total production is used for domestic consumption, and banana is a staple food for at least 400 million people. The major constraints in banana production are diseases (such as Black Sigatoka) and pests (of which nematodes are the most important). Breeding bananas by conventional means is extremely difficult as crosses are very difficult to make, and the triploid genome is difficult to recover. This makes biotechnological approaches, in particular genetic engineering, especially attractive as disease- or pest-resistant genes can be introduced into known cultivars without changing non-target characteristics.

Technologies have been developed for banana transformation at the John Innes Centre (JIC, Norwich, UK). Shoot-tip cultures (Fig. 5) were used for the production of AAA highland Ugandan banana plants and immature inflorescences at JIC. Embryogenic calli and cell-suspension cultures have been successfully produced from immature flowers. Banana plants were regenerated from these embryogenic cell suspension (ECS) at very high frequency. Transformed banana plants (Fig. 1) were produced and transgene structure and expression were monitored in these plants.

The methods will be placed in the public domain and used to support publicly funded research on banana improvement.

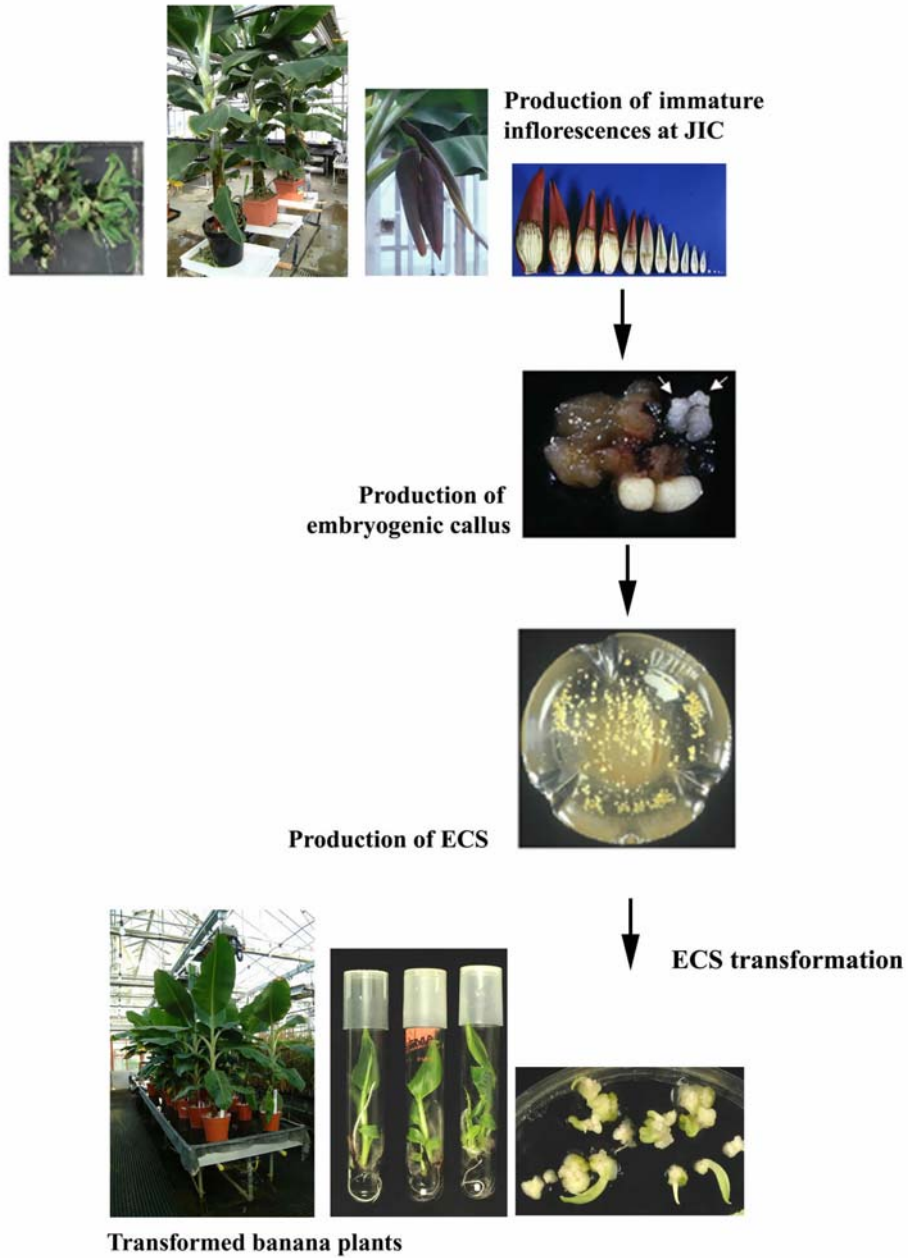


Figure 5. Shoot-tip cultures have been used at JIC to produce immature inflorescences of Ugandan banana.