Inducing embryogenic tissue for transformation of cassava *Manihot esculenta*, Crantz

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**INTRODUCTION**

Totipotent cells are necessary to transform plants and regenerate transgenic lines. In cassava, somatic embryos (SE) and Friable Embryogenic Callus (FEC) have been extensively employed to obtain transgenics. We have worked on the improvement of methods to produce embryogenic tissues, and have developed a very efficient and cheaper methodology which employs liquid medium to induce somatic embryos. The system is called Liquid Film Stationary System (LFSS). It helps reducing costs by using recyclable containers and by eliminating gelling agents. The principles of LFSS we explain below.

**RESULTS AND DISCUSSION**

**Inducing embryogenic structures**

Advantages of using LFSS:
- Uses recyclable containers.
- No gelling agent.
- Reduces amount of medium (0.4 ml LFSS v.s. 2.7 ml in solid medium).
- Generates abundant and excellent quality, embryogenic structures.
- Better nutrition of explants (homogeneous medium v.s. nutrient-depleted areas in solid medium)

**MATERIALS AND METHODS**

Diagram depicting the main steps to produce embryogenic tissues.

1. In vitro cassava plants propagated in vitro
2. Excision of axillary buds
3. Buds to produce embryos in LFSS
4. Organized embryogenic structures in LFSS
5. Embryo maturation
6. Subculture of embryos on medium to induce FEC
7. Somatic embryo synchronization
8. Transformable embryos in cotyledon stage
9. Purified, proliferated and transformable FEC

**Massive production of embryogenic tissues in LFSS**

**Organized embryogenic structures**

**Induction of FEC**

**Transformable, purified FEC**

**Plant regeneration**

**Maturation of embryos from FEC**

**Perspectives**

Producing FEC using LFSS seems promising. Initial attempts have shown excellent results.