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Non-Confidential Description - PSU No. 1736
"Somatic Embryogenesis and Plant Propagation of Cacao"

Keywords:

Embryogenesis, plant propagation, cacao, cuttings, clonal propagation, agriculture

Links:

Inventor website

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Background

Cacao trees (Theobroma cacao L.) have a high degree of genetic heterogeneity. Despite years of research into improved methods for vegetative propagation, cacao trees are currently reproduced only via cuttings. The rooting or grafting of plagiotropic cuttings has a number of disadvantages, including the intensive labor and cost required, slow propagation rates, a wide range of variation in the performance of individual cuttings, an undesirable bush-like growth pattern which can occur, and high susceptibility to wind damage due to the lack of a tap root system. Thus, there is a great demand in cocoa cultivation for an efficient clonal propagation method that can provide plants agronomically similar to seed-derived plants.

Invention Description

The disclosed invention offers an alternative approach for clonal propagation of cacao, using somatic embryogenesis. The process involves the stimulation of somatic embryogenesis and plant regeneration from non-zygotic somatic tissues of cacao. Using this procedure, 100% and over 60% of cultured staminode and petal base explants, respectively, produced somatic embryos. A single cacao staminode explant produced up to 140 primary somatic embryos.

The culture procedure is much simpler than previous methods. It requires less time, labor, and cost. More significantly, the efficiency of somatic embryo production and plant regeneration from staminode and petal base explants improves dramatically over previous methods. In total, these improvements allow for the practical use of somatic embryogenesis for cacao clonal propagation and other applications that require the production of a large quantity of plants from limited source materials.

Advantages/Applications

- Improved efficiency of clonal propagation
- Reduced time, cost, and labor for vegetative reproduction
- Useful for applications requiring a large quantity of plants produced from limited source materials

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