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Plant Regeneration via Organogenesis and Embryogenesis in Sweet Corn

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Abstract

Synthetic seed consisting of somatic embryos enclosed in protective coating are a suitable tool for clonal mass propagation of elite plant varieties. Sweet corn (*Zea mays* var. saccharata) embryogenic callus were derived from culturing immature zygotic embryos at 11 days after pollination on N6 medium that contained 2,4-D 2 mg l^{-1} and sucrose 60 g l^{-1}. Somatic embryos developed when transferred embryogenic callus to N6 medium containing 2 mg l^{-1} 2,4-D and 30 g l^{-1} sucrose. Sweet corn synthetic seed was produced by somatic embryos encapsulated into a protective calcium-alginate matrix which provides mechanical support, protection and was coated with a wax film to prevent desiccation.

Synthetic seeds were produced. It was found that when synthetic seed were treated with 60 g l^{-1} sucrose and stored at 15±2°C for 2 weeks, the percentage of germination of synthetic seeds were 42 %, with 91 % normal seedlings and 8 % abnormal seedlings after they germinated for 8–9 days. When the synthetic seeds were dehydrated by silica gel until 60 % moisture content and then stored for 2 weeks, they could germinate at a rate of 23 %, with 83 % normal seedlings and 17 % abnormal seedlings.

During storage, it was also found that microorganism contamination could be controlled by benomyl. The survival ratio in sweet corn synthetic seed in this investigation indicated that there is still some more research required to increase the number of the survival seeds and the optimum storage technique to prolong their viability.

Keywords: Embryogenesis, organogenesis, plant regeneration, sweet corn, viability

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