

## Artificial seeds

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Somatic embryogenesis is considered to be a method of plant propagation with the potential for very high multiplication rates and low labour costs. The high rates of multiplication are necessary to make genetically transformed plant material available in the shortest possible time.

Somatic embryos encapsulated as "artificial seed" are being developed as a delivery system, with direct sowing in a nursery bed as a goal. Encapsulation in beads of calcium alginate is the most widely reported system, and germination in greenhouse trials of somatic embryos of non-endospermous plant species has been observed. There are no reports of useful levels of germination in open nursery beds.

Endospermous species present an even greater challenge as carbohydrates and amino acids are required by the germinating embryo, and their inclusion in the "artificial seed" formulation increases the risk of microbial damage to the germinating embryo. There has been some progress in the provision of substrates for the germinating embryo in "time release" microcapsules incorporated in the gel matrix surrounding somatic embryos.

The requirements for successful "artificial seed" is discussed and published literature in this area reviewed.