

Inducing Somatic Embryogenesis in Economically Important Conifer Species – Progress and Future Prospects.

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The transition from somatic cells into totipotent embryogenic cells is known as somatic embryogenesis. It is a crucial tool for the biotechnological approach towards the establishment of a basic study system for developmental processes of conifer species as well as for the direct application in forestry by clonal mass propagation. The most successful approach for inducing somatic embryogenesis in conifers to date has been achieved with immature and mature zygotic embryos respectively using high dosage plant growth regulators such as 2,4-Dichlorophenoxyacetic acid (2,4-D) and 6-Benzylaminopurine (BAP). It also has been shown that the addition of Abscisic acid (ABA) normally used for in vitro maturation of somatic embryogenesis, possesses the potential to trigger somatic embryo formation on mature embryos in species which have been recalcitrant with 2,4-D and BAP. We summarize our data obtained for species in the genera *Abies*, *Larix*, *Picea* and *Pseudotsuga* which belong to important conifer taxa in central Europe. Furthermore, we propose different ways to initiate somatic embryogenesis in conifers trying to offer perspectives on the feasibility of alternative methods for induction on mature material. Such include the enhancement of embryogenesis regulating gene activity and the transplantation of embryogenic features by protoplast fusion.