

Genetic engineering in conifer plantation forestry

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Silvae Genetica 55(6) p. 253-262

Abstract

In this review we examine the history and progression of conifer genetic engineering. The review includes the methods used, the conifer species transformed, the genes inserted and the regeneration of genetically engineered conifer trees. We cover both Biolistic® and *Agrobacterium*-mediated transformation, and we detail transformation events with and without plant regeneration. We show that almost all conifer transformation work uses *nptII* as a selective marker, and very often *uidA* is included as a reporter gene. Further, we show that a range of genes that are of commercial interest for forest tree plantations have been introduced, such as herbicide resistance, insect resistance and those related to wood properties. We briefly discuss the future for biotechnology in the context of socially acceptable enhanced plantation forestry and under consideration of benefits and risks.