

Gibberellin *in vitro* research for vegetative propagation of aspen

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Abstract

Distinct and combined effects of growth regulators belonging to gibberellin and auxin classes of plant hormones were investigated in the *in vitro* culture of aspen (*Populus tremula* L.) in order to improve plant hormone (especially, gibberellin) use in vegetative propagation of *Populus* sp. Aspen explants were prepared from *in vitro* grown shoots by removing their leaves and roots and retaining only bare stem segments with several buds. Gibberellic acids GA₃ and GA_{4/7} were added to the nutrient medium in the concentrations of 1 μM and 5 μM. Auxins indole butyric acid (IBA) and naphthalene acetic acid (NAA) were added in the concentration of 4 μM either alone or in combination with 1 μM GA. Gibberellins prominently increased shoot length and the number of shoots emerging per explant, with the higher concentration being more effective. Root formation was promoted by auxins, both IBA and NAA, but only the promotion caused by IBA was not accompanied by any negative effect on shoot development. Shoot growth repression was evident in the case of NAA whose primary effect was induction of plentiful callus. Concerning shoot development, the best results with several-fold increases both in the shoot-growth rate and in the mean shoot number per explant were obtained either with 5 μM GA or on the medium containing both GA_{4/7} and IBA.