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IN VITRO CULTURE OF WOODY CROPS:
PROBLEM SOLVING BY NEW APPROACHES

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Micropropagation of two commercial varieties of apple in bioreactors

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Plants micropropagated in liquid medium (LM) in bioreactors with forced ventilation can show enhanced proliferation and improved physiological status. Additionally, increased medium absorption in bioreactors can impact on development of technologies, such as improving genetic transformation or implementing a nanoparticle delivery system. Plant material was obtained from shoots cultured in semisolid (SS) medium in the FEMa laboratories that were transferred to the MBGb in a COPYTREE collaboration.

Axillary shoots of apple varieties - Golden Delicious (GD) and Royal Gala (RG) - were proliferated and rooted in LM in RITA and Plantform bioreactors.

We investigated the medium type, cytokinin type and concentration, immersion frequency, subculture duration, bioreactor type, supplementation with silver nitrate, including physical supports to hold explants in a vertical position. GD produced vigorous shoots in most of the treatments, whereas RG was more prone to produce hyperhydric shoots. Vigorous shoots cultivated in LM were rooted in $\frac{1}{2}$ MS with micronutrients supplemented with 4.9 μ M indole butyric acid and 3% sucrose, either in SS medium or in bioreactors using temporary or continuous immersion (TIS/CIS).

Both apple varieties rooted more than 75% in all treatments. GD rooted 100% in Plantform using TIS whereas 100% rooting of RG occurred in CIS. Rooted shoots were successfully transferred to soilless media for acclimation.