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Achievements on somatic embryo development in some conifers: what could be learnt? Where are we going?

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Somatic Embryogenesis and Other
Vegetative Propagation Technologies

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Biography

Marie-Anne Lelu-Walter is Research Director in Plant Physiology since 1989 at INRA Centre Val de Loire (Orléans, France), Research Unit in Forest Tree Breeding, Genetics and Physiology. Marie-Anne obtained her Ph.D in 1987 (Plant Biology and Physiology University Paris VI) and is empowered to lead research since 1995. From 1985 to 1987 (Ph.D research), she contributed to pioneering work on Norway spruce somatic embryogenesis from seedlings at AFOCEL (Forest-Cellulose Association, France) under the Direction of Drs A. Franclet and M. Boulay. Marie-Anne has also held a post-doc position (1988-1989) on somatic embryogenesis in spruces at the laboratory headed by Prof. C.H. Bornman in Sweden, Hilleshög Company. Over the past 20 years Dr. Lelu-Walter has been developing cellular and physiological researches on somatic embryogenesis of *Picea*, *Pinus* and *Larix* species especially hybrid larch that became a model system for conifer species.

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Attempts to scale up somatic embryogenesis has been demonstrated in both conifers and broadleaved species. In recent years, many researches focused on somatic embryos development, namely maturation, an important step for subsequently producing vigorous somatic trees.

Somatic embryo maturation is a complex process triggered by many parameters such as environmental conditions that are also depending on the species. Optimized conditions resulted in recovery of cotyledonary somatic embryos that are morphologically similar to the zygotic counterpart.

The optimal duration of maturation has hitherto been determined mainly on the basis of these morphological features and the ability of somatic embryos to germinate and convert into plantlets. However, this empirical approach does not provide any accurate information about the intrinsic quality of harvested cotyledonary somatic embryos as demonstrated by physiological, biochemical and molecular analyses.

Referring to different conifer model systems (larch, pine) we will present the achievements and some lessons that could be learnt for further refinement of cotyledonary somatic embryo development.

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