RECENT DISSERTATIONS

RAGNHILD LYGVED, 2008:

Somatic embryogenesis in *Cyclamen persicum*. Biological investigations and educational aspects of cloning.

Department of Biology, Norwegian University of Science and Technology, Norway. Doctoral theses at NTNU, 2008: 296.

Abstract

Cyclamen persicum, one of the most important ornamental plants in the European market, is propagated via seeds. This generative propagation poses difficulties due to heterogeneity and high prices for seeds, and the ultimate goal is now to produce synthetic seeds via somatic embryogenesis. In order to meet the needs of industrial-scale clonal mass production, quantity and quality modifications of the production system are necessary. The purpose of this doctoral study was to improve the propagation method, by contributing new insights into plant growth in bioreactors and signalling pathways. Mathematical models of the potential effects of oxygen concentration, daily mean temperature, the difference between day and night temperature (DIF), and daily light integral to the development of proembryogenic masses in bioreactors have been developed. Potential molecular markers for *Cyclamen* somatic embryogenesis have been identified using two-dimensional differential gel electrophoresis (2-D DIGE) and MALDI-TOF-MS. The present study also included a didactic section, directed towards students in upper secondary school. The aim of the didactic work was to make the results obtained through the somatic embryogenesis studies available to students, to introduce students to cloning technologies in general, to illustrate that science is a process, that new knowledge develops as a result of ongoing research, and that science has a societal dimension. A context-based digital teaching unit, "Cloning plants" (<http://viten.no>), was designed. The research laboratory and the work performed in the present study were used as the learning context. Norwegian biology students' learning outcomes and the development of their interest in cloning from using the unit have been analysed.

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