

**EFFECTS OF CHOPPER-LIGHT ON *IN VITRO* SHOOT CULTURES OF  
*AMELANCHIER* AND *TILIA***

**Ina Pinker<sup>1\*</sup> and Dieter Oellerich<sup>2</sup>**

<sup>1</sup>Institute of Horticultural Sciences, Humboldt University of Berlin, Albrecht-Thaer-Weg 1,  
D-14195 Berlin, Germany, \*Fax: + 49-30-31471100, \*E-mail: ina.pinker@agrar.hu-berlin.de  
<sup>2</sup>Chopper Light GmbH, 7 Treuenbrietzen Str., 13439 Berlin, Germany, E-mail: DOellerich@aol.com

**REFERENCES**

- Brown H. T., Escombe F. T. (1905). Researches on some of the physiological processes of green leaves, with special reference to the interchange of energy between the leaf and its surrounding. Proceedings of the Royal Society, London, Series B: 29-111.
- Doung T. N., Takamura T., Watanabe H., Okamoto K., Tanaka M. (2003). Response of strawberry plantlets cultured *in vitro* under superb right red and blue emitting diodes (LEDs). Plant Cell, Tissue and Organ Culture, 73: 43-52.
- Hieke B., Neef E. (1989). The rate-limiting step of DCPIP photoreduction by isolated chloroplasts of different plant species, characterized by measurements under intermittent irradiation with variable flash and dark interval. Photosynthetica, 23 (4): 424-536.
- Infante R., Magnanini E., Righetti B. (1989). The role of light and CO<sub>2</sub> in optimising the conditions for shoot proliferation of *Actinidia deliciosa in vitro*. Physiologia Plantarum, 77: 191-195.
- Jao R.-C., Fang W. (2004). Effects of frequency and duty ratio on the growth of potato plantlets *in vitro* using light-emitting diodes. HortScience 39 (2): 375-379.
- Kim S., Hahn E., Heo W., Peak K. (2004). Effect of LEDs on net-photosynthesis rate, growth and leaf stomata of chrysanthemum plantlets *in vitro*. Scientia Horticulturae, 100: 143-151.
- Kozai T., Iwanami Y.G., Fujiwara K. (1987). Effects of CO<sub>2</sub> enrichment on the plantlet growth during the multiplication stage. Plant Tissue Culture Letters 4: 22-26.
- Lees R. P. (1994). Effect of the light environment on photosynthesis and growth *in vitro*. In: Lumbsden P. J. Nicholas J. R., Davies W. J. (Eds.) Physiology, Growth and Development of Plants in Culture. Kluwer Academic Publishers: 31-46.
- Morini S., Muleo R., Sciutti R., Fortuna P. (1993). Relationship between evolution of CO<sub>2</sub> and growth of plum shoot tips cultured *in vitro* under different light/dark regimes. Physiologia Plantarum, 87: 286-290.
- Murashige T., Skoog F. (1962). A revised medium for rapid growth and bioassay with tobacco cultures. Physiologia Plantarum, 15: 473-479.
- Pinker I. (1995). Der Einfluss des Licht/Dunkel-Rhythmus auf die *in vitro*-Vermehrung von Ziergehölz-Sprosskulturen. Gartenbauwissenschaft, 60: 37-41.
- Pinker I. (2000). Chopper-Light for shoot cultures. Acta Horticulturae, 520 (10): 195-202.
- Rabinowitsch E. I. (1956). Photosynthesis and related processes. Vol. 2, Part 2. Interscience New York: 1433-1484.
- Sager J. C., Giger W. (1980). Re-evaluation of published data on the relative photosynthetic efficiency of intermittent and continuous light. Agricultural Meteorology, 22: 289-302.
- Schopfer P., Brennicke A. (1999). Pflanzenphysiologie. Springer-Verlag Berlin, Heidelberg, New York: 430-435.
- Sluis C. (2006). Integrated automation technologies with commercial micropropagation. In: Gupta S. D., Ibaraki Y. (Eds.) Plant Tissue Culture Engineering, Springer Verlag: 231-251.
- Tennessen D. J., Bula R. J., Sharkey T. D. (1995). Efficiency of photosynthesis in continuous and pulsed light emitting diode irradiation. Photosynthesis Research, 44: 261-269.