

NCR-101 Report for 2006

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Research Projects Details are on our web page at www.usu.edu/cpl

Effects of atmospheric ethylene and 1-MCP on growth and development.

We are continuing studies to establish dose/response curves for ethylene effects on the major crop plants. The threshold for ethylene sensitivity appears to be about 10 ppb for pollination and fruit set; and 30 to 50 ppb for leaf enlargement and vegetative growth. Ethylene dramatically reduces stem elongation in many species. We are also studying the use of MCP to reduce the detrimental effects of ethylene. MCP, which is a gas, can be used in greenhouses to prolong flower life of potted plants.

Sterile plant culture for long term studies. We published a paper describing unique procedures for growing plants in sterile culture for up to 80 days.

Phytoremediation: We are continuing studies of the uptake of compounds that contaminate soils.

Plant Nutrition: We are refining procedures for precision nutrient stress of plants in specialized root-zone environments. We have focused on iron and phosphorous stress.

Publications - 2005

Henry, A., W. Doucette, J. Norton, S. Jones, J. Chard, and B. Bugbee. 2006. Design and Maintenance of an Axenic Plant Culture system to Facilitate Optimal growth in Long-term studies. *Jour. Environmental Quality* 35(2):590-598.).

Klassen, S. and B. Bugbee. 2005. Shortwave radiation. Chapter 3. pages 43-58 in: *Micrometeorology in Agriculture Systems*. Am. Soc. of Agronomy monograph no. 47. Madison, WI.

Frantz, J. and B. Bugbee. 2005. Acclimation of Plant Populations to Shade: Photosynthesis, Respiration, and Carbon Use Efficiency. *Jour. Am. Soc. Hort. Sci.* 130:918-927.

Doucette, W. B. Wheeler, J. Chard, B. Bugbee, C. Naylor, J. Carbone, and R. Sims. 2005. Uptake of Nonylphenol and Nonylphenol Ethoxylates by Crested Wheatgrass. *Environ. Toxicology and Chemistry* 24:2965-2972.