NCERA-101 Report for 2007

Utah State University
Research Greenhouses; Logan, Utah 84322-4820
Bruce Bugbee bruce.bugbee@usu.edu
Alec Hay alec.hay@usu.edu
Julie Chard jchard@usu.edu

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

Effects of atmospheric ethylene and 1-MCP on growth and development. As we develop increasingly sophisticated tests, we find that the threshold for ethylene sensitivity is lower than we once thought. Vegetative growth is significantly reduced by continuous exposure to only 20 ppb ethylene in several crops. Ethylene dramatically reduces stem elongation in many species, but it increases stem elongation in several other species. 1-MCP reduces the detrimental effects of ethylene, but the protective effect last only 3 to 4 days. MCP is much more effective when applied as a gas than as a spray.

Phytoremediation: We are continuing studies of the uptake of compounds that contaminate soils. The uptake rate does not appear to be constant over time, even in steady state conditions.

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

Publications – 2006-2007

Frantz, J., N. Cometti, M. van Iersel, and B. Bugbee. 2007. Rethinking Acclimation of Growth and Maintenance Respiration of Tomato in Elevated CO_2: Effects of a Sudden Change in Light at Different Temperatures. Jour. Plant Ecology (*accepted*).

Henry, A., W. Doucette, J. Norton, and B. Bugbee. 2007. Changes in Crested Wheatgrass Root Exudation caused by Flood, Drought, and Nutrient Stress. Jour. Environmental Quality (*in press*).

Chard, B., W. Doucette, J, Chard, and B. Bugbee. 2006. Trichloroethylene Uptake by Apple and Peach Trees and Transfer to Fruit. Environ. Sci. and Technology 40(15):4788-4793.

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.