

**Duke University Phytotron  
2009 Station Report to the NCERA-101 Committee  
Compiled by Norman Hill**

**NEW FACILITIES AND EQUIPMENT**

In 2008 14 new plant growth chambers were installed at the Duke University Phytotron. Installed were 7 EGC Model GC-8 chambers, 6 EGC Model GCW-30 chambers and 1 EGC Model SLR-48 Shelf Lighted Room. All of the new chambers are controlled by EGC TC2 microcontrollers connected to the EGC C5 Control System running ControlNet software. Eight of the forty year-old EGC Model M-13 reach-in chambers were updated with TC2 microcontrollers also connected to the C5 control system.

**ACCOMPLISHMENT SUMMARIES**

Duke University researchers have developed an imaging system, Versatile Imager for Positron Emitting Radiotracers (VIPER), to investigate the impact of elevated levels of atmospheric CO<sub>2</sub> on carbon and nitrogen dynamics in plants using <sup>11</sup>C as a radiotracer.

**IMPACT STATEMENTS**

Production of corn in the U.S. has negatively impacted the quality of watersheds and the Gulf of Mexico by the runoff of the large amounts of nitrogen fertilizer used in corn production. Duke University researchers are producing corn plants that require less nitrogen fertilizer by breeding with Eastern Gamagrass, a warm-season bunch grass native to the eastern U.S.

**SELECTED PUBLICATIONS**

Dinneny, J.R., T.A. Long, J.Y. Wang, J.W. Jung, D. Mace, S. Pointer, C. Barron, S.M. Brady, J. Schiefelbein and P.N. Benfey. 2008. Cell identity mediates the response of Arabidopsis roots to abiotic stress. *Science* 320:942-945.

Eubanks, M.W. and D. Richter. 2008. Enhancing nitrogen use efficiency in corn through intragression of low N tolerance from Eastern Gamagrass. Invited NSF Session No.699. Celebrating the International Year of Planet Earth. Ecological Society of America, American Society of Agronomy, Crop Science Society of America, Madison, WI. p.232.

Kiser, M.R., C.D. Reid, A.S. Crowell and C.R. Howell. 2008. Exploring the transport of plant metabolites. *HFSP Journal* 2: 189-204.

