

Duke University Phytotron
2008 Station Report to the NCERA-101 Committee
Compiled by Norman Hill

NEW FACILITIES AND EQUIPMENT

After several years of numerous upgrades in control systems and facilities, no new equipment has been installed during the past year. However, due to increased demand from Duke University researchers for additional growth chamber space, especially for Arabidopsis research, we are preparing to install 12 and possibly more new growth chambers in the Phytotron in the next six months.

ACCOMPLISHMENT SUMMARIES

Research conducted partially at Duke University Phytotron by Athenix Corp. has discovered more than 60 new Bt genes, which is one of the largest collections of insecticidal genes available to the agricultural biotechnology community.

A study at Duke University is using genomics approaches to identifying genes responsible for root system architecture traits. New tools being developed to image and analyze root system architecture could make far-reaching contributions to the use of plant genomics resources toward agriculture improvement.

IMPACT STATEMENTS

Nitrogen runoff from U.S. cornfields has seriously impacted watersheds and the Gulf of Mexico. Low nitrogen corn genotypes being developed by Sun Dance Genetics at the Duke University Phytotron have the potential to reduce fertilizer requirements by 35%. These corn hybrids could have broad environmental benefits due to reduced fertilizer runoff into the Mississippi River Basin.

SELECTED PUBLICATIONS

Maestre, F.T., and J.F. Reynolds. 2007. Amount or pattern? Grassland responses to the heterogeneity and availability of two key resources. *Ecology*. 88(2), pp. 501-511.

Maestre, F.T., and J.F. Reynolds. 2006. Small-scale spatial heterogeneity in the vertical distribution of soil nutrients has limited effects on the growth and development of *Prosopis glandulosa* seedlings. *Plant Ecology* (2006) 183:65-75.

Maestre, F.T., and J.F. Reynolds. 2006. Nutrient availability and atmospheric CO₂ partial pressure modulate the effects of nutrient heterogeneity on the size structure of populations in grassland species. *Annals of Botany* 98: 227-235.