NCR-101 STATION REPORT, ORBITAL TECHNOLOGIES CORPORATION, MADISON, WI (MARCH 2005)

Robert C. Morrow
1212 Fourier Drive, Madison, WI 53717
Phone: 608 229-2728
E-mail: morrow@orbitec.com

New Facilities:
A second 10,000 sq. ft. facility has been acquired and will serve mainly as an assembly and manufacturing facility. Research activities will continue to be housed in the main ORBITEC building.

Equipment/Sensors/Control Systems:
A build of a rooting module with active control of soil moisture, root zone oxygen, and root zone temperature was recently completed as part of the CANDS SBIR project. Several high density LED lighting arrays of various configurations are being fabricated for testing at ORBITEC and other facilities. Science Evaluation Units developed for the Advanced Animal Habitat and Plant Research Unit are currently undergoing testing. Recent equipment purchases-Apogee SPEC-UV/PAR spectroradiometer, Apogee UVM-SS ultraviolet meter.

CE Related Projects:
Plant Research Unit – Development of plant habitat for ISS Centrifuge Facility.
Deployable Vegetable Production Unit – Plant growth unit that expands to 10 times its stowage volume.
Aseptic Plant Culture System – Environmental control systems for use at culture vessel level in sterile plant systems.
Advanced life support architecture studies – Trade studies on hybrid PC/bio systems.
BPSe and SpaceGarden – Education/outreach plant growth systems.
Heliac- Advanced control systems for LED lighting.

Unique Plant Responses:
We have found that a 2-3°C elevation of root zone temperature over shoot zone temperature has a severe impact on Brassica rapa development, even when the root zone temperature is well within acceptable limits for plant growth. High humidity alleviates the response.
Using wild type Arabidopsis thaliana var. Landsberg we have seen significant changes in rosette and stem morphology, coloration, and overall growth between plants grown at different soil moisture levels.
We are currently working on growing plants on thin fabric mats.

Committees/Panels:
ASHS CE Working Group (Morrow)
ASGSB Education Committee (Morrow, Tuominen)
AIAA Life Sciences & Systems Technical Committee (Morrow)
AIAA Microgravity & Space Processes Technical Committee (Gustafson)
AIAA Space Colonization Technical Committee (Rice, Gustafson, White)

Recent Papers:

Website:
www.orbitec.com
www.planet-llc.com