NCERA-101 Station Report 2009
University of Wisconsin Biotron

1. **Impact Nugget.**
   University of Wisconsin Biotron has successful incorporated the Deluca research program for the duration of a 3-4 year renovation of the Biochemistry building. The patents held by this research program are the top royalty (~15mil/year) generator for WARF (Wisconsin Alumni Research Foundation).

2. **New Facilities and Equipment.**
   University of Wisconsin-Biotron is continuing to replace the old control cards (1970's made in-house) for the environmental control rooms with new Johnson Controls architecture. We are using the new NAE building automation hubs, MS-FEC 2620 field controllers, coupled with ACI(Middleton, WI) RH3-1K-2W-D temperature/RH sensor, 1K-3W-BP backup temperature/anticipation sensors and LLS light sensors for simple alarming if lights are on or off. The new Johnson Controls architecture require us to install new EPT's(electro-pneumatic transducers) Kele, (Bartlett, TN) EPT-UCP-422-F, power supplies (Johnson Controls) PAN-PWRSP-0, extension modules (Johnson Controls) MS-10M2710-0.
   Biotron is currently at 100% occupancy, with a waiting list for control environment plant rooms, animal housing rooms and greenhouse rooms. The challenge is trying to schedule the installation of the new control system and not disrupt research projects. This complication could prolong the control system conversion several years. We should have the first floor completed by the end of 2009.

3. **Unique Plant Responses.**
   University of Wisconsin Biotron set up a control environment room (102 sq ft) with cool white T12-215W 1500 Ma fluorescent lights and installed yellow Plexiglas light barriers. Wisconsin Seed Potato Certification Program which is administered through the University of Wisconsin Plant Pathology Department has found when growing tissue culture potato plantlets under this light quality increased the number of nodes, stem length and decreased callus production. The use of the yellow Plexiglas removes the blue-green (380-525) portion of the spectrum.

4. **Accomplishment Summaries.**
   Photosynthetically active radiation (PAR) influenced the outcome of the interaction of soybean and the fungal pathogen *Sclerotinia sclerotiorum*. This knowledge is critical for the development of soybean lines that are resistant to this pathogen. The Biotron was required for this research.

5. **Impact Statements**
   University of Wisconsin Biotron has found out that replacing the T12 high output 1500 mA fluorescent lamps in the control environment plant rooms with T8HO

lamps will save approximate 55% in electricity. We currently have around 1000 lamps in use. An added advantage is the T8 lamps typically last twice as long as the T12 lamps. The T8 lamps fit into the exact same socket but would require new electronic ballasts. T8 lamps provide about the same light quality and quantity for plant growth. We are looking at converting all plant rooms and paying for the upgrade with energy savings.

6. Published Written Works.

Biotron does not compile a list of publications generated from research experiments conducted by the users of the facility. Below are a few publications that found my desk:

Bhaskar, P.B., Raasch, J.A., Kramer, L.C., Neumann, P., Wielgus, S.M., Austin-Phillips, S., and Jiang, J. (2008) Sgt1, but not Rar1, is essential for the RB-mediated broad-spectrum resistance to potato late blight. BMC Plant Biol. 8: 8.

Halterman, D.A., Kramer, L.C., Wielgus, S., and Jiang, J. (2008) Performance of transgenic potato containing the late blight resistance gene RB. Plant Dis. 92: 339-343.

Peltier, A.J., and Grau, C.R. 2008. The influence of light on relationships between Sclerotinia stem rot of soybean in field and controlled environments. Plant Dis. 92:1510-1514.

7. Scientific and Outreach Oral Presentations.

Biotron Director Dr. Hannah Carey (hibernation studies at University of Wisconsin Biotron) presented the following outreach presentations:

January 18, 2008: Presentation on hibernation to 2nd graders at Shorewood Elementary School, Madison WI

February 1, 2008: Interviewed for MSNBC website article “How animals gauge the weather”

February 22, 2008: Interview for Forbes magazine article on “Unlocking the secrets of hibernation”

March 2008: Taped segment on hibernation for KVMR radio (Northern California).

July, 2008: Public lecture on hibernation for Kemp Natural Resources Station Outreach Program, Woodruff, WI

February 17 and 24, 2009: Presentations on hibernation to preschoolers at Pre School of the Arts (Madison, WI) and our laboratory