University of Maryland – College Park
NCR-101 Station Report, 2002

New Facilities Under Construction

1. Horticultural Greenhouse Complex

A wide range of Research and Commercial Floriculture crops as well as Nursery crops will be grown in this Facility

- 40K+ sq. ft greenhouses + 30k sq. ft. Head-house
- 33 zones, ranging in size from 865 sq. ft. to 3,000 sq. ft.
- Glass Glazing – tempered Horticultural Glass
- Hot Water Heating - Walls and Gutters
- Fogging System and Positive Pressure Fans for Cooling
- Acme Exhaust Fans for Increased Air Flow
- Priva Control Systems – Maximizers (33ea)
- Temperature and Humidity monitored for each zone with some Carbon Dioxide control & monitoring
- Automatic Shading System – 50% Shade & 55% heat retention
- 400 Watt High Pressure Sodium Fixtures supplemental lighting with100 Watt Incandescents for photoperiod interruption
- Fertigation injection system allowing custom blend delivery Dosmatics & Nutrimix by Priva
- Chamber Pesticide Sprayer - 4 each 2' x 8' chambers
- Rolling and Stationary benches in each zone
- Cold Frames and a Shade House will be installed as well
- Netafim Drip, Spray and Dribble irrigation

2. Center for Agriculture Biotechnology Greenhouse

Arabidopsis, Tobacco and possibly Canola

- 6000 Square Foot
- 4 partitions each 24'w x 36' l and 1 Partition 24'w x 72'l
- Glass Glazing
- 14' sidewalls
- Roof Vents – Double Roof Vents Screened with Anti-Thrip & Anti-Virus cloth
- Priva Controls – Priva Maximizer Controls
- Temp/Hum sensors per zone – Li-Cor Laboratory Quality
- Weather Station w/Wind Speed & Direction, Outdoor Temp/Hum. PAR Sensor
- 1000-Watt Metal Halide & High Pressure Sodium Fixtures – Delivering 250 Micromoles over entire Zone
- Kool-Cel w/Exhaust Fans for Cooling
- Hot Water Heat – Floors, Walls & Gutters
- Automatic Shade System – 40% Shade & 25% Heat Retention
- Reverse Osmosis System
- Fertigation system – Dosmatic Injectors
- Rolling and Stationary Benches
- Drip Irrigation Featuring Netafim Dribble Stakes

Growth Chambers

- Grant request for 8 each Percival Arabidopsis Chambers Model – AR75L. One AR75L received and operational. The Conviron E7/2 Model Chambers are on our wish list as well.
- This will augment our 21 Conviron BDR-8 Reach-In Chambers and our 9 Conviron BDW-36 Walk-In Chambers.
- We also use older model Reach-In Percival & EGC Chambers and Walk-In EGC chambers for Cell Biology and Molecular Genetics Research as well as Entomological and Natural Resource Science Research.
- Typically, you will see Arabidopsis, Clover, Alfalfa, Poplars, Thlaspi, Tobacco, Carnations, Apples, Potatoes, Soybeans, Snap Dragons, Turfgrass Varieties, and Mosquitoes, Beetles Algae and Fungi (Intentional) in our 100+ Growth Chambers

New Facility Control Systems

- Greenhouses will be controlled exclusively by Priva control systems

- Growth Chamber Controllers range from the following:
- Conviron Touch Screen control Systems – 4030 System
- EGC Control Systems – TC2 & C3 Control Systems
- Percival Digital & Analog Control Systems
- Climate Technologies Whatlow Series 982 Digital Control System
- Aarabidopsis Research Growth Chambers will be monitored by Q-COM's missing Link system.
- Temperature/Humidity monitoring with future PAR and Carbon Dioxide systems.
- Web site developed for mutli-user monitoring of Growth Chambers and environmental conditions.
- We are currently working with General Electric on developing lighting systems that will be more environmentally friendly as well as more energy efficient.
- We are sourcing the manufacture of single Phosphor Lamps in the Red, Far-Red, Green and Ultra-Violet ranges in the F48T12-VHO format we are also exploring the production of Wide Spectrum Grow Lights in this format as well
- The next step is to develop lamp-dimming programs for HID and Fluorescent lighting fixtures in Greenhouse and Growth Chamber environments.

New Facility Sensors and Instrumentation

- Li-Cor Instruments will supply temperature Sensors. (Lab Quality)
- Li-Cor Instruments will supply Humidity Sensors. (Lab Quality)
- Apogee Instruments will supply PAR sensors.
- Priva Control Systems will supply Weather Stations for each Greenhouse range.

Workshops Attended (John Korns)

Conviron – Winnipeg, Manitoba, Canada

- Trouble shooting Training for Mechanical, Electrical and Programming of all Models of Conviron Growth Chambers
- In depth training on various Growth Chamber models as well as Control Systems

Consultations (John Korns)

- Design and Installation of State of the Art Greenhouses and Support Facilities for the Reduction of Generation times and the Development of Transgenic Cotton and Corn varieties. Dow Life Sciences Division (Dow Agro) - 30k square Feet Growing Space
- Developed Greenhouse design for "Fast Track" Transgenic Cotton Greenhouses and Seed Multiplication of new Varieties for Cotton Seed Distributors of Wee Waa, New South Wales, Australia. - 44k square feet
- Design Consultation on Monsanto Companies Transgenic Early Corn and Cotton Generation Greenhouses. Jerseyville, Illinois - 20k square feet Growing Space
- Designed Research/Production Greenhouses for Southeast Missouri State University, Cape Girardeau, Mo. - 12k square Feet Growing Space
- Designing Hydroponic Production Greenhouses acres and Production Greenhouses as well as Bio-Remediation Laboratory for Enhanced Urban Services, a "Welfare to Work" Training Facility in St. Louis, Missouri. In Conjunction with various State and Federal Agencies as well as State and Federal Government Representatives
- Designed CARB II Greenhouse range for University of Maryland – College Park - 6k square feet divided into 5 zones