

#### 1. New facilities planned or installed

- New transgenic greenhouse complex (5,760 sq ft greenhouse, 6,120 sq ft future greenhouse space and 1,392 sq ft Arabidopsis growth room) was constructed on the top of parking garage building.

#### 2. Cooperative/interdisciplinary projects

- Optimization of transplants transportation environments [Dr. Chieri Kubota, Plant Sciences]
- Production of high quality cherry tomatoes under semiarid climate [Johann Buck, Plant Sciences]
- Production of high sugar and high lycopene tomatoes under semiarid climate [Min Wu, Plant Sciences]
- Measurement of canopy gas exchange and energy balance of greenhouse tomato plants. [Chieri Kubota, Plant Sciences]
- Use of narrow-waveband LEDs for in vitro induction and development of carrot somatic embryos [Joel Cuello, Ag. Biosystems Eng.]
- Design of cyanobacterial flat-plate photobioreactor for sequestration of CO<sub>2</sub> [Joel Cuello, Ag. Biosystems Eng.]
- Performance Testing of Water-Cooled LED arrays [Joel Cuello, Ag. Biosystems Eng.]

#### 3. Workshops/colloquia/symposia

- **A Greenhouse Crop Production and Engineering Design Short Course** was held for January 19 to 22, 2004, as a continuing professional education short course from the University of Arizona. The course programs can be viewed at <http://www.ag.arizona.edu/ceac/>. The meeting included a tour to EuroFresh Co. (Willcox, AZ).

#### 4. Recent Publications

- Costa, G.J.C. and **J.L. Cuello**. 2004. The phytometric system: A new concept of light measurement for plants. *Journal of the Illuminating Engineering Society of North America*. 33(1): 34-42.
- Costa, P., G.A. Giacomelli, **C. Kubota**, and M. Jensen. 2004. Preliminary study on the effects of environmental conditions and salinity on tomato plants (*Lycopersicon esculentum*) growth status in semi-arid region *Acta Horticulturae*, 659, 557-564.
- Fujiwara, M., **C. Kubota**, T. Kozai, and K. Sakami. 2004. Air temperature effect on leaf development in vegetative propagation of sweetpotato single node cutting under artificial lighting. *Scientia Horticulturae* 99:249-256.
- Kubota, C.** 2004. Plant responses to greenhouse environmental factors. Proceedings for the Greenhouse Crop Production and Engineering Design Short Course. January 18-21, Tucson, AZ.
- Kubota, C.** and M. Wu. 2004. Controlled environment for enhancing tomato fruit flavor. Proceedings for the Greenhouse Crop Production and Engineering Design Short Course. January 18-21, Tucson, AZ.
- Kubota, C.**, M. Kroggel, D. Solomon, and L. Benne. 2004. Analyses and optimization of long distance transportation conditions for high quality tomato seedlings. *Acta Horticulturae*, 659, 227-234.
- Kubota, C.**, P.A. Rorabaugh, and M. Kroggel. 2005. Use of grafted seedlings for commercial tomato production in North America. *HortTechnology* (under review).
- Ohyama, K., K. Manabe, Y. Omura, T. Kozai and **C. Kubota**. 2005. Potential use of a 24-hour photoperiod (continuous light) with alternating air temperature for production of tomato plug transplants in a closed system. *HortScience* 40 (in press).
- Ono, E. and **J.L. Cuello**. 2003. Design parameters of solar concentrating systems for CO<sub>2</sub>-mitigating algal photobioreactors. In *Greenhouse Gas Control Technologies*. J. Gale and Y. Kaya (eds.). Pergamon Press: London. pp. 1503-1510.
- Ono, E. and **J.L. Cuello**. 2004. Design parameters of solar concentrating systems for CO<sub>2</sub>-mitigating algal photobioreactors. *Energy* 29: 1651-1657.
- Suarez-Romero, A., G. Giacomelli, **C. Kubota**, and M. Jensen. 2004. Control strategy and sensors for the climate conditioning in a retractable roof greenhouse in semi-arid regions *Acta Horticulturae*, 659, 97-104.
- Uno, K. Ohyama, T. Kozai, and **C. Kubota**. 2004. Photoautotrophic culture with CO<sub>2</sub> enrichment for improving micropropagation of *Coffea arabusta* using somatic embryos. *Acta Horticulturae* 625, 271-277.

Wu, M., J.S. Buck, and C. **Kubota**. 2004. Effects of nutrient solution EC, plant microclimate and cultivars on fruit quality and yield of hydroponic tomatoes (*Lycopersicon esculentum*). *Acta Horticulturae*, 659, 541-547.

#### 5. Internet Sites

- The University of Arizona Controlled Environment Agriculture Center home page: <http://ag.arizona.edu/ceac>
- Tomato Live! Website: <http://ag.arizona.edu/ceac/tomlive/index.htm>
- Greenhouse education materials repository: <http://badger.uvm.edu/dspace/handle/2051/1924>

#### 6. Video

- Arizona greenhouse videos: <http://badger.uvm.edu/dspace/handle/2051/1932/browse-title>

#### 7. New course

PLS 579/ABE 579 Applied Instrumentation for Controlled Environment Agriculture [Kubota and Giacomelli, 3 units]