

**NCR-101: Committee on Controlled Environment Technology and Use
2005 Station Report**

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Personnel

Ryan Warner was hired as an assistant professor in the Department in September 2004. Ryan obtained his Ph.D. with John Erwin at the University of Minnesota. This position (75% research, 25% teaching) is similar to that vacated by Royal Heins in February 2004, although it has a more basic research component.

Ki Sun Kim (Seoul National Univ., Korea) spent a one-year sabbatical leave at Michigan State Univ. from February 2004 to February 2005. Erik Runkle was his host.

New Facilities

Nine new growth chambers from Enconair were installed. Four of these are Enconair's model GC-20's, two are similar but are high light chambers (with a combination of high pressure sodium and metal halide fixtures), and three (somewhat similar) are designed to operate (with lights on) at below freezing (-5 °C) temperatures. The high light and low temperature chambers are aimed at satisfying the special needs of several groups on campus. These chambers are the last of 27 total chambers funded primarily by an NSF Major Research Instrumentation Grant.

Research Projects

Our current major research projects in floriculture and controlled environments include:

- Determining the environmental induction of flowering of *Phalaenopsis*, *Miltoniopsis*, and *Zygopetalum* orchids utilizing 12 constant and fluctuating day/night temperatures.
- Quantifying the vernalization responses of several herbaceous perennial species. Plants are being cooled in ten growth chambers with temperature setpoints of -2.5 to 20 °C for various durations.
- Determining the effects of light quantity and temperature on stock plant management of herbaceous plants, and the effects on quality and performance of subsequent cuttings.
- Quantifying how unrooted herbaceous cuttings tolerate temperature stress using growth chambers set at 0 to 30 °C.
- Determining the effects of light quantity and temperature on floral induction and crop timing of herbaceous bedding plants.
- Understanding the mechanisms of failed floral development under high temperature stress.
- Identifying the photoperiod and vernalization responses for flowering in several herbaceous perennial plants.

“Lighting Up Profits” Article Series and Book on Greenhouse Lighting

Erik Runkle and Paul Fisher (Univ. of New Hampshire) coordinated a 14-article series of magazine articles that appeared in *Greenhouse Grower* magazine from September 2003 through September 2004. A 98-page book was published by MeisterMedia Worldwide in July, 2004 and includes information in the articles, plus case studies, study questions, and research highlights. The book also includes a cd that contains PowerPoint presentations for each chapter and light conversion tables.

The intended audience for the book includes greenhouse growers, industry sales and technical staff, and university students. The book can be purchased through MeisterMedia Worldwide and Ball Publishing. Proceeds benefit the Floriculture Industry Research and Scholarship Trust.

Contributors to this project include: Theo Blom (Univ. of Guelph), A.J. Both (Rutgers Univ.), Art Cameron (Michigan State Univ.), Martine Dorais (Laval Univ.), John Erwin (Univ. of Minnesota), Jim Faust (Clemson Univ.), Paul Fisher (Univ. of New Hampshire), Royal Heins (Michigan State Univ.), Erik Runkle (Michigan State Univ.), Marc van Iersel (Univ. of Georgia), Helma Verberkt (DLV Facet, The Netherlands) and Ryan Warner (formerly Univ. of Minnesota). Additional researchers authored research highlights.

2004 Publications

Beckwith, A.G., Y. Zhang, N.P. Seeram, A.C. Cameron and M.G. Nair. 2004. Relationship of light quantity and anthocyanin production in *Pennisetum setaceum* cvs *Rubrum* and *Red Riding Hood*. *J. Agric. Food Chem.* 52:456-461.

Cameron, A.C. 2004. Ornamental Grasses – A new wave in Floriculture Crops. *Greenhouse Product News*. 14(9):50-54.

Cameron, A., B. Fausey, and E. Runkle. 2004. Lighting up profits: lighting of perennial crops. *Greenhouse Grower* 22(9):58-66.

Cameron, A., B. Fausey, C. Whitman, and E. Runkle. 2004. Tender perennials. *Greenhouse Product News* 14(6):64-68.

Clifford, S.C., E.S. Runkle, F.A. Langton, A. Mead, S.A. Foster, S. Pearson, and R.D. Heins. 2004. Height control of poinsettia using photoselective filters. *HortScience* 39(2):383-387.

Enfield, A., R. Heins, E. Runkle, and A. Cameron. 2004. Quick-cropping perennials. *FlowerTech* 7(4):28-31.

Fisher, P. and E. Runkle. 2004. *Lighting Up Profits: Understanding Greenhouse Lighting*. 98 pp. MeisterMedia Worldwide, Willoughby, Ohio.

Fisher, P., J. Faust, and E. Runkle. 2004. Lighting up profits: light management for stock plants. *Greenhouse Grower* 22(6):96-104.

- Glady, J., S. Lang, and E. Runkle. 2004. Managing perennial stock plants with Florel. *Greenhouse Product News* 14(8):78-83.
- Heins, R.D. and E. Runkle. 2004. Lighting up profits: materials and strategies for greenhouse shade. *Greenhouse Grower* 22(1):132-140.
- Lopez, R. and E. Runkle. 2004. The flowering of orchids: a reality check. *Orchids* 73(3):196-203.
- Lopez, R.G. and E.S Runkle. 2004. The effect of temperature on leaf and flower development and flower longevity of *Zygopetalum* Redvale 'Fire Kiss' orchid. *HortScience* 39(7):1630-1634.
- Niu, G., R. Heins, A. Cameron, and W. Carlson. 2004. Vernalization and Devernalization of *Campanula* 'Birch Hybrid' and *Leucanthemum* × *superbum* 'Snow Cap'. *HortScience*. 39: 1647-1649.
- Rohwer, C., E. Runkle, and R. Heins. 2004. Flowering spring cactus. *Greenhouse Product News* 14(13):46-51.
- Runkle, E.S. 2004. Growing Trends: Optimize your temperatures. *Greenhouse Management and Production* 24(12):65-67.
- Runkle, E.S. 2004. Growing Trends: Look, think, be outside the box. *Greenhouse Management and Production* 24(8):58-59.
- Runkle, E. and R. Heins. 2004. Florel on summer production of pansy. *Greenhouse Product News* 14(4):36-38.
- Runkle, E.S. 2004. Growing Trends: Tips for growth retardants. *Greenhouse Management and Production* 24(4):50-52.
- Shimizu, H., E.S. Runkle, and R.D. Heins. 2004. A steady-state model for prediction of poinsettia plant shoot-tip temperature. *J. Amer. Soc. Hort. Sci.* 129(3):303-312.