

NCR-101: Committee on Controlled Environment Technology and Use
2005 Station Report
Department of Horticulture, Michigan State University
East Lansing, MI 48824 USA

Erik Runkle
517-355-5191 x350
runkleer@msu.edu

Art Cameron
517-355-5191 x338
cameron@msu.edu

Ryan Warner
517-355-5191 x344
warnerry@msu.edu

New Facilities

We are currently renovating a greenhouse range consisting of six greenhouse sections. Structural improvements to each section include: a new fan-and-pad system, installation of horizontal air flow fans, new electrical systems and wiring, and partial removal of a solid north wall and replacement with glazing. We have also purchased a Priva Intégro (version 723) environmental control computer, Intégro interface panels, and a new weather station, all of which are currently being installed. These renovations will improve our ability to control the environment in each of these six greenhouse compartments. Approximately 70% of the costs for this project are being funded by an internal competitive grant from the Michigan Agricultural Experiment Station.

Research Projects

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

- Determining the effects of daily light integral on stock plant management of herbaceous plants, and the effects on quality and performance of subsequent cuttings
- Quantifying how nonrooted herbaceous cuttings tolerate temperature stress using growth chambers set at 0 to 30 °C
- Determining the effects of daily light integral during propagation on rooting of herbaceous bedding plants
- Understanding when several bedding plant species become sensitive to photoperiod (end of juvenility), and how many inductive cycles are needed for flowering
- Determining the environmental induction of flowering of several orchid genera, especially *Phalaenopsis*, *Miltoniopsis*, and *Zygopetalum*
- Identifying the photoperiod and vernalization responses for flowering in approximately 15 herbaceous perennial species
- Determining whether there is an interaction of photoperiod and daily light integral on flowering of *Coreopsis*
- Comparing over 20 different *Echinacea* cultivars for greenhouse flowering and subsequent outdoor performance
- Quantifying the response of herbaceous annuals and perennials to plant growth retardants
- Application of various plant growth regulators to stock plants and cuttings to improve their postharvest performance

Refereed Publications, 2005

- Fausey, B.A., R.D. Heins, and A.C. Cameron. 2005. Daily light integral impacts flowering and quality of greenhouse-grown *Achillea*, *Gaura*, and *Lavandula*. HortScience 40:114-118.
- Lopez, R.G. and E.S. Runkle. 2005. Environmental physiology of growth and flowering of orchids. HortScience 40(7):1969-1973.
- Lopez, R.G., E.S. Runkle, and R.D. Heins. 2005. Flowering of the orchid *Miltoniopsis* Augres 'Trinity' is influenced by photoperiod and temperature. Acta Hort. 683:175-180.

- Pramuk, L.A. and E.S. Runkle. 2005. Modeling growth and development of *Celosia* and *Impatiens* in response to temperature and photosynthetic daily light integral. *J. Amer. Soc. Hort. Sci.* 130(6):813-818.
- Pramuk, L.A. and E.S. Runkle. 2005. Photosynthetic daily light integral during the seedling stage influences subsequent growth and flowering of *Celosia*, *Impatiens*, *Salvia*, *Tagetes*, and *Viola*. *HortScience* 40(5):1336-1339.
- Warner, R.W. and J.E. Erwin. 2005. Naturally occurring variation in high temperature induced floral bud abortion across *Arabidopsis thaliana* accessions. *Plant Cell Environ.* 28:1255-1266.
- Warner, R.W. and J.E. Erwin. 2005. Prolonged high temperature exposure and daily light integral impact growth and flowering of five herbaceous ornamental species. *J. Amer. Soc. Hort. Sci.* 130:319-325.

Grower Articles, 2005

- Blanchard, M. and E. Runkle. 2005. PGR liner dips on bedding plants. *Greenhouse Product News* 15(13):44-51.
- Blanchard, M.G. and E.S. Runkle. 2005. Effekter av døgning lysmengde hos *Phalaenopsis* i potte. *Gartneryrket* 103(8):15-16. (In Norwegian).
- Blanchard, M., M. Olrich, and E. Runkle. 2005. Fascination on poinsettia. *Greenhouse Product News* 15(9):66-71.
- Blanchard, M., R. Lopez, E. Runkle, and Y.-T. Wang. 2005. The orchid grower, Part IV. *Greenhouse Grower* 23(12):86-92.
- Cameron, A.C. and B. Fausey. 2005. Ornamental bananas and elephant ears have exotic garden potential. *Greenhouse Management and Production*, June 30-35.
- Cameron, A., B. Fausey, S. Padhye, and E. Runkle. 2005. Some perennials like it cold. *Greenhouse Grower* 23(12):38-46.
- Erwin, J., R. Warner, and C. Rohwer. 2005. Fundamentals of flowering. *Greenhouse Grower* 23(5):100-104.
- Erwin, J. R. Warner, C. Rohwer, and N. Mattson. 2005. Fundamentals of flowering. *Greenhouse Grower* 23(4): 70-77.
- Erwin, J., R. Warner, C. Rohwer, and N. Mattson. 2005. Fundamentals of flowering. *Greenhouse Grower* 23(3):108-112.
- Fisher, P. and E. Runkle. 2005. 10 lighting tips to help your bottom line. *Greenhouse Management and Production* 25(4):36-40.
- Lopez, R. and E. Runkle. 2005. Managing light during propagation. *Greenhouse Product News* 15(6):48-58.
- Lopez, R., E. Runkle, Y.-T. Wang, and M. Blanchard. 2005. The orchid grower, Part III. *Greenhouse Grower* 23(10):96-104.
- Padhye, S. and A.C. Cameron. 2005. Coreopsis: A great all-American genus. *Greenhouse Product News* July:100-104.
- Padhye, S., C. Whitman, E. Runkle, and A. Cameron. 2005. Cool campanula. *Greenhouse Product News* 15(10):72-79.
- Runkle, E. 2005. Business COK to debut. *Greenhouse Grower* 23(12):60-62.
- Runkle, E. 2005. Get educated. *Greenhouse Grower* 23(6):52-54.
- Runkle, E.S. 2005. Growing Trends: 10 ways to lower your spring heating bill and save money. *Greenhouse Management and Production* 25(12):59-60.
- Runkle, E.S. 2005. Growing Trends: How to increase plant height. *Greenhouse Management and Production* 25(8):74-77.
- Runkle, E. 2005. Growing Trends: What's up with orchids? *Greenhouse Management and Production* 25(4):60-61.
- Runkle, E., Y.-T. Wang, M. Blanchard, and R. Lopez. 2005. The orchid grower, Part I. *Greenhouse Grower* 23(8):64-70.
- Whitman, C., M. Olrich, and E. Runkle. 2005. Sumagic on bedding plants. *Greenhouse Product News* 15(4):66-71.
- Wang, Y.-T., M. Blanchard, R. Lopez, and E. Runkle. 2005. The orchid grower, Part II. *Greenhouse Grower* 23(9):70-74.