

Floriculture Group at North Carolina State University

An introduction to the floriculture group at NCSU

By Brian Whipker

The floriculture group at North Carolina State University involves individuals from a number of departments, including horticulture, plant pathology and entomology. The core group in Horticultural Science includes John Dole, William Fonteno, Paul Nelson and Brian Whipker. Paul Nelson fully retired at the end of June 2007, but as a Professor Emeritus he has retained an active research program in the area of plant nutrition. Steven Frank has been the key contact in the Entomology department with his involvement in Ornamental Extension and Research. Kelly Ivors of the Plant Pathology department is involved with Extension and Research for ornamental plant diseases. The strength of the floriculture group has been its focus on both applied industry-related projects and also fundamental research.

Coursework and Educational Opportunities

Enrollment in the ornamentals area continues to be strong at North Carolina State University. John Dole teaches Greenhouse Management, which typically has 20 to 28 students per semester. He also teaches the hands-on production course — Floriculture Production — which typically enrolls 20 to 25 students per semester. The graduate level Plant Nutrition course will be taught by Brian Whipker via distance education starting in the fall of 2011. William Fonteno teaches the graduate level Professional Skills Development course. John Dole also teaches a Physiology of Flowering for the graduate students. For the two-year program courses, William Fonteno is the department coordinator and teaches two classes, Plant Growth and Development and Greenhouse Crop Production.



A closer look at nutrient disorders

NC State's influence on teaching also extends across the globe. Paul Nelson's *Greenhouse Operations and Management* (the newly revised 7th edition will be available in 2011) and *Floriculture Principles and Species* by John Dole and Harold Wilkins are the primary books used by most floriculture students. Gus DeHertogh's *Holland Bulb Forcers Guide* and *Physiology of Bulbs* are still the two main resources for bulb growers. The floriculture group has also published *Nutrient Deficiencies in Bedding Plants* and *Cutting*

Propagation. Lane Greer, a former student, and John Dole have also published an excellent guide on *Woody Cut Stems for Growers and Florists*.

Floriculture Extension and Outreach

Brian Whipker in Horticultural Science, Kelly Ivors in Plant Pathology, and Steven Frank in Entomology all have primary responsibilities for floriculture extension. Additional expertise comes from Charles Safley in Agricultural Economics,



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Joe Neal for greenhouse weed control, and given the industry focus of the floriculture program at NCSU, the other floriculture faculty also provide assistance to grower questions.

Grower Publications

The writing of grower-related production guides has been a primary emphasis of the floriculture group at NC State University. Problem identification guides for pansies, bedding plants, fall crops, vegetative annuals, poinsettias, geraniums, and insect and mite pests have been published (available at www.nccfga.org). These color photographic guides to the nutritional, physiological, insect and disease problems are printed on plastic and are excellent for assisting in problem diagnosis. In addition, manuals have been written on Pansy Production, Plant Root Zone Management, Cut Flowers and PourThru Monitoring.

Plant Disease and Insect Clinic

An excellent resource for North Carolina and U.S. growers is the Plant Disease and Insect Clinic. Barbara Shew, the director, along with Mike Munster, Shawn Butler and David Stephan, provide grower-based identification services for plant diseases and insect problems. North Carolina State University is uniquely different from most university diagnostic labs, in that sample diagnosis and providing management recommendations is jointly performed by faculty extension specialists (Kelly Ivors, Steven Frank, Joe Neal and Brian Whipker) assigned to a particular commodity and the clinic. In addition, the clinic is one of the few locations growers can have ethylene samples tested when problems are suspected with their heating system. Additional information about sample submis-

sion and costs are available at www.cals.ncsu.edu/plantpath/extension/clinic.

Plant Tissue and Solution Analysis

The North Carolina Department of Agriculture and Consumer Services – Agronomic Division offers soilless substrate, plant tissue, water and fertilizer analysis services. The low cost of \$5 for this service makes it an excellent value for North Carolina residents. If you want additional elements analyzed (Mo, Cl and NO₃), there is an additional cost of \$2 each. Out-of-state samples cost \$25, with the same additional \$2 cost

for adding Mo, Cl and NO₃. Sample submission guidelines and forms can be found at: www.ncagr.gov/agronomi/index.htm.

Horticultural Substrates Laboratory

William Fonteno's lab is the testing center for the National Certification Program for the Mulch and Soil Council and also provides a diagnostic service for the Horticultural Substrates Laboratory (<http://www4.ncsu.edu/university/lockers/project/hortsublab/index.html>).

All America Trials

The J.C. Raulston Arboretum is a host site for the All America evaluation trials. Ted Bilderback, director of the J.C. Raulston Arboretum, and Bernadette Clark coordinate the trials. Each summer, a field day is co-hosted by the North Carolina Commercial Flower Growers' Association to highlight the trials. For 2011 the field day will be on June 29. Trial reports are available online at www.ncsu.edu/jcraulstonarboretum. Select "Annual Trial Reports" from the publications link.

National Poinsettia Trials

The National Poinsettia Trial Program is a cooperative program with John Dole at NCSU, Joe Stoffregen and Denise Ethridge at Home-wood Nursery and Garden Center of Raleigh and Jim Barrett at University of Florida that evaluates new poinsettia cultivars each year. Two open houses each year allow the breeders, suppliers, growers and consumers to evaluate the cultivars. The production characteristics of and consumer reactions to the cultivars are determined. Ingram McCall is responsible for growing the plants and the program is funded by a consortium of



Trialing plant growth regulators on dahlia

poinsettia breeders. A variety of other trials and studies are conducted each year along with the main trial.

National Cut Flower Trial Programs

In cooperation with the Association of Specialty Cut Flower Growers, NCSU coordinates the National Cut Flower Trial Programs, which evaluate seed-grown, perennial, woody and greenhouse cut flowers. Each year 40 to 80 new cultivars are evaluated at the farms and fields of 30 to 40 cut flower growers and universities around the United States, including NCSU. Since its inception in 1993, the trial programs have evaluated over 800 new cultivars. Information can be found at: www.ncsu.edu/project/cutflowers.

Disease and Insect Management of Floriculture Crops

Project Participants: Kelly Ivors and Steven Frank

Funding Sources: Chemical companies and industry suppliers.

Each year we evaluate management strategies for disease and insect control of floriculture crops. These activities range from efficacy trials using traditional chemical crop protectants and experimental products.

Cut Flower Production and Postharvest

Project Participants: John Dole, William Fonteno, Sylvia Blankenship, Ingram McCall and Diane Mays.

Funding Sources: American Floral Endowment, Association of Specialty Cut Flower Growers Research Foundation, Fred C. Gloeckner Foundation, Hill Foundation, and various industry suppliers and producers including floral foods suppliers, breeders, perennial suppliers and chemical suppliers.

North Carolina State University is recognized

as the only university in the United States with a comprehensive research program on greenhouse and field cut flowers. Our program includes new cultivar evaluations, production studies, post-harvest experiments and marketing analysis. Postharvest, in particular, has become one of the most important issues in the cut flower industry and our research focuses on developing post-harvest protocols for new crops, anti-ethylene agents, and other methods for extending storage and vase life. Check out the website for more details: www.ncsu.edu/project/cutflowers.

PGR Research

Project Participants: Brian Whipker, Ingram McCall and Jared Barnes

Funding Sources: Bayer, Fine, OHP, SePRO, Syngenta and Valent USA.

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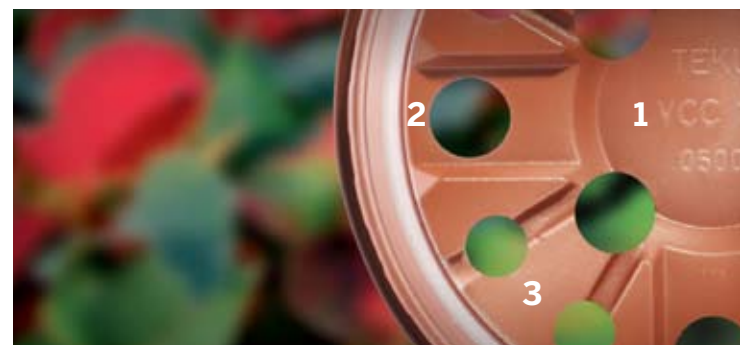
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Plant Nutritional Disorders

Project Participants: Brian Whipker, Ingram McCall, Jared Barnes and Jonathan Frantz.

Funding Sources: USDA-ARS and various companies.

The objective of this project is to create nutrient

deficiencies and toxicities of potted plants in order to determine critical tissue concentrations and visual symptoms.

Substrate pH Stabilization

Project Participants: Paul Nelson, Ka Yeon

Jeong, Jared Barnes, Brian Whipker and Jonathan Frantz.

Funding Sources: USDA-ARS, Rockwell Farms and various companies.

The objective of this project is to determine the effect of composted manure on the physical properties of the substrate and the resulting buffering capacity provided by stabilizing the pH.

Postharvest Handling and Propagation of URCs

Project Participants: John Dole, Brian Whipker, Ingram McCall and Diane Mays.

Funding Sources: American Floral Endowment, USDA FNRI and a consortium of unrooted cutting suppliers including Ball FloraPlant, Fides, Metrolina Greenhouses, Oro Farms, Paul Ecke Ranch, Smithers Oasis and Syngenta.

This is a cooperative project between NCSU and Jim Faust at Clemson focusing on improving cutting performance by increasing our understanding of stock plant production, the post-harvest physiology of unrooted cuttings, the package environment, and subsequent effects on propagation, growth and flowering.


Horticultural Substrates: Standards and Safety

Project Participants: William Fonteno and Beth Harden

Funding Sources: Mulch and Soil Council and substrate industry.

The objectives of this project are to develop laboratory techniques for the measurement of physical and chemical properties of substrates; and then develop physical, chemical and safety standards for potting soils, soil amendments and mulches.

Future

The NCSU Floriculture group appreciates the excellent industry support of the program. The strong industry focus of research, extension and teaching areas help to keep the program relevant to the needs of the greenhouse industry. This partnership has worked well in the past and hopefully will continue in the future. 

Brian Whipker is a professor in the department of horticultural sciences at North Carolina State University. He can be reached at brian_whipker@ncsu.edu.

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