

Ornamental Plant Germplasm Center (OPGC)

PRINCIPAL INVESTIGATORS:

Dr. Bill Randle, Chair, Department of Horticulture and Crop Science, The Ohio State University (OSU); Co-Investigator Susan Stieve, OPGC Interim Director and Curator.

PROJECT OBJECTIVES:

To furnish genetic raw materials and associated information to enhance American floricultural productivity to ensure a high-quality supply of herbaceous ornamentals.

ACCOMPLISHMENTS:

The USDA National Plant Germplasm System's Herbaceous Ornamental Crop Germplasm Committee, comprised of stakeholders and members of the germplasm user community from federal, state, and private sectors, has identified six genera of herbaceous ornamentals as priorities for conservation at the OPGC: *Begonia*, *Coreopsis*, *Lilium*, *Phlox*, *Rudbeckia*, and Old World *Viola* species. Three components of the OPGC mission include conservation of genetic resources, characterization of those resources, and education and outreach including distribution of OPGC germplasm to appropriate users.

Conservation - since 2006:

- The center has acquired 763 new accessions, raising the total number of accessions conserved to almost 3,200, including 540 accessions of priority species (17 percent of the collection), as well as 200 other genera and over 850 species.
- In October 2008, OPGC staff conducted a very successful 11-day, 4,000 mile collecting trip throughout the southeastern United States; 65 accessions were collected, including *Coreopsis* (19 accessions), *Rudbeckia* (27), and *Lilium* (1).
- The center has successfully produced seed of 289 accessions, or a total of 400 accessions since 2001, making them available for distribution and off-site backup.
- 166 accessions have been backed up at the USDA National Center for Genetic Resource Preservation and the Arctic Seed Vault in Svalbard, Norway; a total of 1,322 accessions, or 41 percent of the collection, are backed up off-site.

Characterization- Characterization data will be made publicly available on the Germplasm Resources Information Network (GRIN) database, www.ars-grin.gov. Characterization projects have included:

- Screening the clonal *Begonia* (108 accessions) and *Pelargonium* (210 accessions) collections for viruses (OPGC staff, Agdia and Scott Leisner, University of Toledo).
- Characterizing *Begonia* accessions for light response and *Pelargonium* accessions for nutrient use (Jonathan Frantz, USDA-ARS Toledo).
- *Begonia* characterization for their response to *Pythium ultimum*, a fungal pathogen that can attack plants during production (Medani Omer, USDA-ARS Toledo).
- Using OPGC germplasm in pesticide effectiveness spray research (Heping Zhu, USDA-ARS Wooster).

- Evaluating OPGC germplasm ornamental qualities in The Ohio State University Trial Garden (Claudio Pasian and Bart Hayes, OSU).
- *Pelargonium* flower petal extract to control Japanese beetles (Chris Ranger, USDA-ARS Wooster).
- Ethylene response of petunia accessions (Michelle Jones, OSU).
- Using molecular techniques to determine pansy ancestors (Dan Robarts, OSU)
- Developing transformation and gene silencing tools for fundamental research and horticultural improvement in pansy (Harvey Ballard, Ohio University, and John Finer, OSU).
- Developing bar code technology for OPGC accession characterization and inventory maintenance (Bryon Hand, USDA-ARS Toledo).

Education and Outreach - In the past 3 years:

- The OPGC has fulfilled 173 germplasm requests containing a total of 957 order items. The largest community of germplasm users has included U.S. state agencies and universities (approximately 50 percent of requests) and U.S. commercial companies (25 percent).
- Center accomplishments have been publicized at 14 professional meetings in the past 3 years including a booth at the Ohio Florists' Association Trade Show; more than 3,000 pieces of OPGC informational literature including bookmarks, brochures and research summaries are distributed annually.
- The OPGC has provided educational work opportunities for over 40 undergraduates and interns from The Ohio State University and elsewhere; many students have since obtained jobs in the floriculture industry.
- 580 people have toured the OPGC facility.

TECHNOLOGY TRANSFER/IMPACT SINCE 2006:

- Center staff has been invited to speak at five international professional meetings, published five peer-reviewed publications and 13 abstracts. Additionally, the center has been featured in four articles in the popular press and a PBS televised show.
- 763 new accessions of herbaceous ornamentals have been conserved and are being made available to researchers around the world.
- The OPGC website contains information about the center and germplasm being conserved; the Web site is accessed more than 10,000 times annually.

ADDITIONAL FUNDING/EXTERNAL SUPPORT:

Since 2006 this project has received \$1.12 million in in-kind contributions from The Ohio State University and a \$17,000 germplasm collection grant from the USDA-ARS Plant Exploration Office. Additionally, a \$30,000 endowment account has been established by stakeholders in the floriculture industry to help support the center.

ADDITIONAL COLLABORATORS:

In addition to collaborators already mentioned, many others have been involved with the OPGC in the past 3 years including:

- Mark Feily, Ernst Conservation Seed Co. – Identification of locations for collection of native plant germplasm in southeastern United States.

- Lowell Urbatsch, Louisiana State University – Author of *Rudbeckia* treatment, Flora of North America; identification of *Rudbeckia* and where to collect in the United States.
- Mesfin Tadesse, The OSU Herbarium – Identification of wild-collected *Coreopsis*.
- Samuel Contreras, OSU – Evaluation of maternal environment on seed quality.
- Julio Marcos Filho, USP/ESALQ, Brazil – Using Tomato Analyzer software to determine embryo size in x-rayed seeds.
- Researchers from the USDA-ARS, The Ohio State University, Ohio University, University of Minnesota, University of Tennessee, Texas A&M, West Virginia State University, and elsewhere on grant proposals using OPGC germplasm.