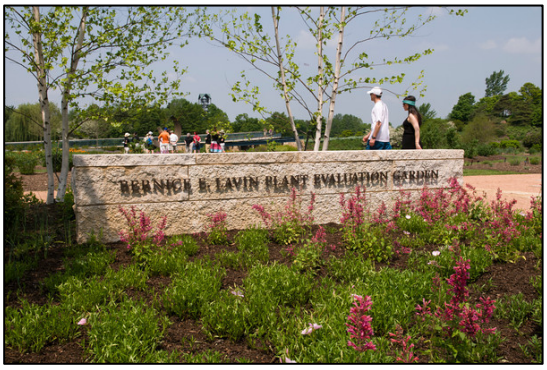
Chicago Botanic Garden
A Report on the
Bernice E. Lavin Plant Evaluation Garden and
Plant Evaluation Program
July 2014

Among the many curious visitors to the Bernice E. Lavin Plant Evaluation Garden in the past year was Her Royal Highness Princess Sirindhorn of Thailand, who was impressed with the garden's beautiful design and research function. Growing interest in the Lavin Garden, spurred by increased accessibility via the Trellis Bridge and published plant evaluation trials in *Fine Gardening*—one of the world's premier gardening magazines—has raised its profile as a public display garden and demonstration of Upper Midwest plant performance. All at the Chicago Botanic Garden are deeply grateful to the Lavin Family Foundation for dedicating this area in 1998, for supporting recent renovations, and for committing valuable endowment support that will help sustain plant evaluation activities in the years to come.

Bernice E. Lavin Plant Evaluation Garden



The Lavin Garden is a rare treasure among the Garden's display beds, for in addition to showcasing an aesthetic collection of sun-loving plants, it also allows for up-close observation and evaluation of plant performance. Organized alphabetically by genus, the Lavin Garden provides a total of 2.5 acres of evaluation and breeding space, with plants arrayed in concentric arcs around a central sundial and leading north along the shoreline. From plants that perform surprisingly well in the region, such as the *Opuntia* (cactus), to stunners with recognized curb appeal, such as *Hydrangea serrata*, plants that are successful in the Lavin Garden—as well as those that fare poorly—provide valuable insight for home gardeners, landscape designers, and horticulture professionals seeking plants that will thrive in the region.

While under evaluation, plants in the Lavin Garden are typically observed at least once per week—for four years for perennials, and for six years for shrubs and vines. The Garden's plant evaluation manager, Richard Hawke, along with intern Heidi Peterson, visit the garden and record detailed observations about a host of environmental and plant conditions, including flower stage and flower color, stem height and rigidity, leaf character and ornamental qualities, soil quality, and weather conditions. Over 1,200 taxa (representing approximately 55,000 plants) were evaluated last year in the Lavin Plant Evaluation Garden, Pullman Plant Evaluation Garden, and the Green Roof Gardens.

In the past year, Hawke introduced 219 new taxa, representing more than 1,400 plants, into the evaluation gardens. Among the new trials conducted in the Lavin Garden are ornamental grasses (*Molinia* spp.), shrubby bush clovers (*Lespedeza* spp.), and Russian sages (*Perovskia* spp.). The majority of this year's new trial plants were donated by long-time collaborators from the United States and abroad, including Bailey Nursery, Ball Horticultural, Blooms of Bressingham (England), Jelitto Perennial Seeds, Monrovia Growers, North Creek Nurseries, Proven Winters, Spring Meadow Nursery, and Walters Gardens, Plants Nouveau, Intrinsic Perennials, and David Austin Roses.

The arrival of these trial plants hardly could have come at a better time. One of the more significant events of the past year was the proliferation of the incurable disease, Aster yellows, which ended a four-year old trial coneflower trial prematurely. Spread by the leaf hopper (*Macrosteles quadrilineatus),* the disease infected more than 90 percent of cultivars. All 130 cultivars were extracted by early spring. Plant evaluation manager Richard Hawke said he was disappointed to see the collection fall prey to the disease, but excited for the opportunity to start new trials in the vacated space.

Taking the place of the coneflowers are three plants with pleasing aesthetic qualities and strong research potential. The first, *Molinia*, is a whiskery, tussock-forming grass, native to damp moorland in Europe and south and west Asia. The emergence of new commercially available varieties presents a timely opportunity for study, and a welcome occasion to diversify the Garden's grass collection. The next selection, *Lespedeza*, is a genus of late-season flowering shrubs in the pea family. Native to warm temperate to subtropical regions of eastern North America, the plant is rarely planted in Chicago—though Hawke is uncertain as to why and eager to investigate. If early plant trial observations are any indication, *Lespedeza* could be a welcome option for home gardeners in years to come; the hardy shrub endured this year's notoriously long, snowy, and cold winter with minimal loss. The third addition, *Perovskia,* or Russian sage, can be recognized by its tall wispy wands of lavender flowers and silvery foliage. Found in many landscaped street medians and home gardens in Chicago, the plant needs little maintenance, is pest resistant, and shows off well against most flowers. Hawke hopes to lend insight to the taxonomy of new varieties on the market, for which there is little consensus among plant professionals.

The Plant Evaluation Program

The Lavin Family Foundation's endowment is helping sustain the entirety of the Garden's plant evaluation program, including research at the Bernice E. Lavin Plant Evaluation Garden and Green Roof Garden. Recognized with an Award for Program Excellence from the American Public Gardens Association in 2008, the program is one of the few in the United States that formally evaluates perennials. The goal of the plant evaluation program is to study and recommend, through scientific evaluation, which plants are superior for gardens in the upper Midwest. The majority of plants are readily available in area nurseries.

Plant evaluation is a particularly exciting aspect of the Green Roof Garden—fully half of which is dedicated to testing a broad variety of new plants for green roof culture. Through a grant from the Sally Mead Hands Foundation, the Garden is evaluating 200 plant species for their use in rooftop gardens. Results will be distilled and reported in an October 2014 issue of *Plant Evaluation Notes*, a publication that has become a standard bearer for garden professionals seeking to make informed decisions about which plants to buy, breed, and sell, as well as how to care for them. Hawke also wishes to publish the study's results as a master list of top-performing green roof plants in popular magazines such as *Fine Gardening* and the *Green Roof Living Monitor.*

With minimal care and irrigation, the vast majority of grasses, perennials, and woody plants have performed well, particularly at deeper 6" to 8" planting depths. High levels of early season moisture and cooler temperatures made 2013 a banner year for the partridge pea (*Cassia fasciculate*), which seeded prolifically and drew the attention of visitors—as well as butterflies and bees—with its

serrated leaves and showy yellow flowers. Over the past four years, drought tolerant plants, such as the prickly pear cactus (*Opuntia spp.)* Arrowleaf violet (*viola sagittata*) and prairie dropseed (*Sporobolus heterolepis*), have done surprisingly well despite extreme weather conditions. "This was always an experiment," Hawke said. "We know now what these plants do. It still seems amazing that they are growing so well on a hot, dry roof."

Over the next several months, new interactive capabilities will be added to the green features kiosk of the Daniel F. and Ada L. Rice Plant Conservation Science Center to increase visitor engagement with the Green Roof Garden. For example, a roof temperature profile is being planned by Garden ecologist Dave Sollenberger to calculate weekly temperature averages at each media layer of the Green Roof Garden, from three feet above the roof to deep within the thermal core. Web-linked data, updated at 15 and 60 minute intervals from multiple data collection points, will allow visitors an evolving snapshot of soil moisture and heat flux across a range of planting depths. These numbers will be compared against those in a traditional roof to show the roof's cooling capacity.

While attracting Garden guests, tour groups, and visiting professionals from across the nation, the Green Roof Garden is also serving as an experimental test site for students in the Plant Biology and Conservation science program, a joint graduate program led by the Garden and Northwestern University. Kelly Ksiazek, a Ph.D. student, is entering her third year of a project to examine the potential of green roofs to support dry prairie plant communities. In 2013, additional species were added to monitor pollen flow on the green roof. While study results are not expected until 2015, early data show promising signs. Many prairie forb and grass seeds survived their first winter, germinated, and grew into healthy juveniles. Additional plant plugs grown in the greenhouse were added this spring, with the hope the prairie community will be established by late summer.

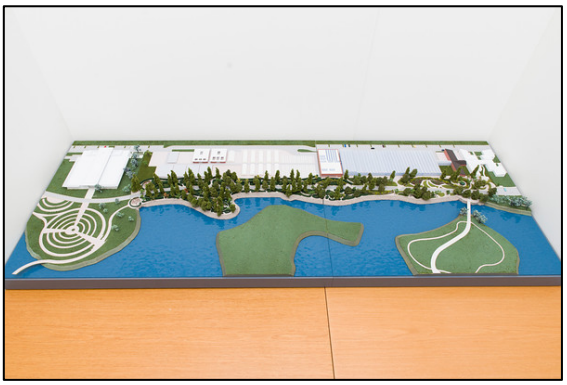
To disseminate their knowledge of horticulture and green roof technology to a broad audience, Hawke and horticulturist Emily Shelton have taught certificate program classes, led tours and informational sessions, and attended national conferences. Below are the past year's highlights:

- Participated in the Green Roof for Healthy Cities Conference in San Francisco
- Led tours of the green roof gardens to the Coastal Maine Botanical Garden board, University of Illinois master gardeners, Rotary Botanical Garden staff, Illinois Institute of Technology landscape architecture students, Michigan State University Extension staff and master gardeners, International Plant Propagators members, Meijer Botanic Garden staff, Olbrich Botanic Garden staff, Chicago City Hall green roof staff, as well as local and national garden clubs, donors, landscape architects and green roof consultants
- Led informational sessions for participants in the University of Illinois Extension Master Gardener Program, Camp CBG, College First, and Windy City Harvest
- Taught an elective course for the professional gardener certificate program, Roof Deck Gardening, which included a case study on the green roof as well as a garden walk
- Prepared an in-depth case study for incorporation into the *Green Roof's for Healthy Cities Advanced Green Roof Maintenance* course manual
- Submitted a video, and participated in a live Q&A, for the Greenroofs.com 2013 Virtual Summit
- Presented lectures at Michigan State University Plants of Distinction Symposium in Grand Rapids, Smart Gardening Conference in Marquette, Indianapolis Museum of Art Horticultural Society, and the Hardy Plant Society in Philadelphia

Lessons from the plant evaluation program were disseminated also through the Garden's relationship with *Fine Gardening* magazine. Pushing an initial two-year agreement that began in 2011 to a four-year commitment through 2014, the editors have informed Hawke that his articles are consistently among the most popular in the magazine. Hawke's article "Catmint," which reported on nearly 50 types of catmints (*Nepeta* spp.) trialed at the garden since 1999, appeared in the August 2013 issue. Additional articles on trials of ornamental grasses and Ligularias appeared in November and March issues. Interested readers may access all 37 issues of *Plant Evaluation Notes* as downloadable PDFs on the Garden's website or as free iTunes podcasts. In the most recent edition, "A Comparative Study of Joe-Pye Weeds (*Eutrochium* spp.) and Their Relatives," Hawke summarizes the performance of 26 taxa of the late-season perennial in the aster family. Four of the plants in the 13-year trial (2001-2013) received five-star excellent ratings for their overall performance, including *Ageratina altissima* 'Chocolate', *Eutrochium dubium* 'Little Joe', *E. fistulosum* 'Carin', and *E. fistulosum* f. *albidum* 'Bartered Bride'.

The Jarantoski Campus

To continue to maintain and even redefine the horticultural excellence for which the Garden is known, staff have been working closely with Booth Hansen Architects and Rough Brothers greenhouse engineers on the design of a new, expanded plant production facility on the south end of campus. The updated facility, along with an innovative display garden, will ensure the Garden's ability to support advanced plant conservation research and expand its highly successful plant-based education program.



The Kris Jarantoski Campus, as the new campus will be known, is named in honor of Executive Vice President and Director Kris Jarantoski's guiding vision. A serpentine landscape design by Peter Wirtz—who created installations for the Louvre and Christian Dior Haute Couture spring fashion show in Paris—will unite the entire south campus, from Evening Island and the Lavin Garden through the plant production facilities to the Dixon Prairie. New greenhouses, with improved energy efficiency, will increase the indoor growing space from its current 18,000 square feet to more than 55,000 square feet. The structures will have 26 climate-controlled zones compared to the 11 in place, and the new outdoor nursery space will be 150,000 square feet. When complete, the Jarantoski Campus will transform the south end of the Garden into a visitor destination.

To allow for renovations and expansion of the main nursery, the William Pullman Plant Evaluation Garden was closed to the public in early May 2014. Garden staff from Collections, Horticulture, and Facilities removed and transplanted the most desirable trees, shrubs, perennials; the remaining plants, stones, benches, and timbers were offered at no cost to Garden staff. In an all-staff meeting, Jarantoski spoke of the difficult but well-reasoned decision to eliminate the Pullman Garden. Currently, the Pullman garden is nestled into a corner, close to the greenhouses and nursery, and hidden from all but the most curious visitors. The new Wirtz-designed shade garden, while preserving space for the shade evaluation program, will be a readily accessible draw for visitors and allow space for facility expansion.

The Lavin Garden will frame a gateway, or "front door," to the Jarantoski Campus. A pedestrian path across the Trellis Bridge will lead from the Lavin Garden to a grove of high-spire trees that announce the entrance to a strolling shade garden of pyramidal trees and sinuous hedges. The Wirtz garden will meander past cathedral-like dawn redwoods, bald cypresses, rustling fountain grasses, and European beech hedges. A veil of shadow created by the tall trees will screen out western sunlight, while framing intimate paths that lead past pergolas, mounded yews, and a crabapple arbor—enticing visitors to journey deeper into the Wirtz garden and continue to the Dixon Prairie, where they may complete a broad loop of the Garden.

Research areas for shade trials of herbaceous perennials, groundcover plants, vines, and shrubs will be incorporated into the scope of the new shade evaluation garden. Bed shapes will reference the curvilinear design of the Lavin Garden and include areas of permanent shade (e.g., cast by buildings, lath, privacy fences, or evergreen conifers) and seasonal shade (cast by deciduous trees and shrubs). Variable levels of light filtration will allow for a spectrum of test conditions for studying shade plants. A sunny location in the Wirtz garden will be dedicated to rose evaluation; and an interpretive stop along the walk will provide visitors with the opportunity to view the greenhouses, while witnessing the technology—such as supplemental lighting, shade cloth, heated benches, and mist/fog sprayers—that goes into producing quality greenhouse plants.

The first phase of the $40 million Jarantoski Campus has recently begun with the movement of the in-ground nursery. Nursery construction will be complete by 2015, and the new shade evaluation garden is scheduled to open in 2018. Just as the Lavin Garden serves to deepen understanding of the art and science of horticulture through active plant trials on display for visitors, the new Jarantoski Campus will support an important research mission while delighting guests with its beauty. "It's really unlimited what we can do," Hawke said. "Having the Plant Science Center, Lavin Garden, and shade garden side by side will be a major draw. Ephemeral signage has proven to be a good thing to push people here, but now we will be able to pull them through."

Conclusion

The Chicago Botanic Garden's plant evaluation program depends on the Bernice E. Lavin Plant Evaluation Garden for the study of perennials, shrubs, and vines. Thanks to the recent additions of interpretive signage, the circular path, and Trellis Bridge, more visitors and garden professionals are enjoying the Lavin Garden and learning which plants will succeed locally—before they go in the ground. In the coming years, visitation is expected to increase as the new Jarantoski Campus invites visitors to enter an enchanting secret garden that not only borders the Lavin Garden but accentuates its beauty through a compelling contrast of sun and shade. With some areas of permanent shade and others of partial light filtering through sculpted trees, curving hedges and latticed pergolas, a new shade evaluation garden will ensure the Garden's plant evaluation program continues to be one of the largest and most diverse in the nation. We are deeply grateful to the Lavin Family Foundation for its support of the Lavin Garden and plant evaluation program, and hope you are pleased with the accomplishments of the past year.