

Chicago Botanic Garden Plant Evaluation Program

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Summary

The Chicago Botanic Garden's Plant Evaluation Program was established in 1982 and is currently one of the largest and most diverse evaluation programs. The program focusses mainly on herbaceous plants, but some woody plants are included. For comparative trials,

commercially available species and cultivars within specific plant genera and grow in side-by-side for easy comparison of traits and performance. Invasive plant trials undertaken include numerous taxa from international collecting trips as well as common garden plants.

INTRODUCTION

The Chicago Botanic Garden's Plant Evaluation Program was established in 1982 and is currently one of the largest and most diverse evaluation programs focusing primarily on perennial plants in the U.S. There are six components of the program: comparative trials, cooperative trials, green roof, plant exploration, invasive plants, and special projects.

Comparative Trials

For comparative trials, we acquire commercially available species and cultivars within specific plant genera and grow them side-by-side for easy comparison of traits and performance. There are several criteria we consider when selecting comparative trials, including:

- Important horticultural or garden genera, such as salvia, geranium, and phlox,
- Genera with significant breeding developments, such as *Echinacea* and *Coreopsis*,
- Genera or plants that are at the time uncommon locally, such as betonies, geums, and potentillas,
- Winter hardiness/adaptability, such as *Stokesia*, English shrub roses, and gen-tians,
- Cultural adaptability to conditions of site, such as soils, moisture, and exposure,
- Specific disease issues, such as powdery mildew and rust.

There are 18 targeted trials underway in 2021, including *Anemone*, *Astrantia*, *Baptisia*, *Buddleja*, *Calamagrostis*, *Calycanthus*, *Chrysanthemum*, *Deschampsia*, *Echinacea*, *Hibiscus*, *Kniphofia*, *Leucanthemum*, \times *Mangave*, *Phlox*, *Physocarpus*, *Salvia*, *Sanguisorba*, and *Silphium*.

Our trial gardens are open to the public. The primary trial garden (Figure 1, left) is a full-sun site with 7.5 pH, well-drained to periodically moisture retentive clay loam soils, and no wind protection. A new shade trial garden (Figure 1, right) is opening in October 2021; the initial comparative trials include *Abelia*, *Ajuga*, *Bergenia*, *Carex*, *Clematis*, *Helleborus*, *Hydrangea arborescens*, and *Pulmonaria*.



Figure 1. Primary trial garden (left) and new shade trial garden (right).

The primary advantages of comparative trials are:

1. Compare old and new cultivars
2. Evaluate uncommon or underused garden plants
3. Evaluate new and unreleased plants from the Garden's breeding program and other plant breeders

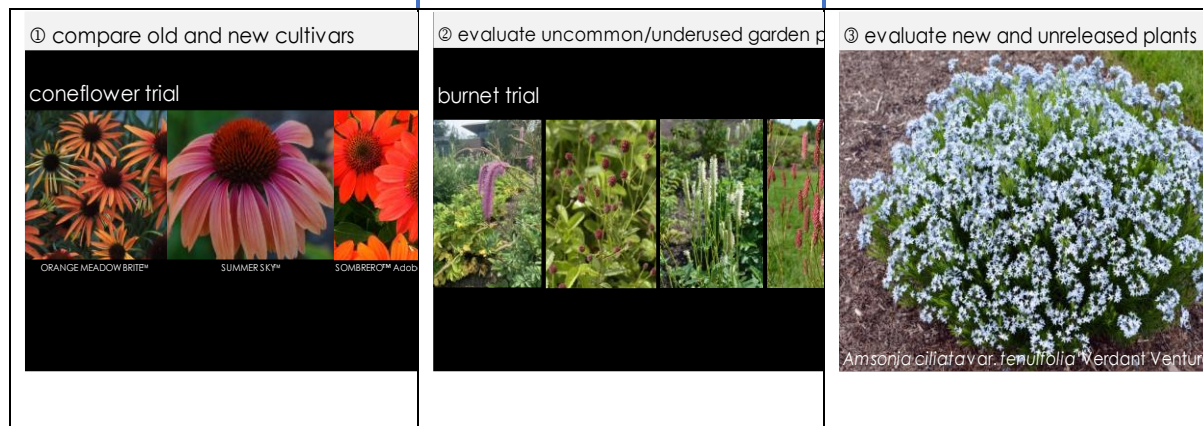


Figure 2. Comparative trial examples (left to right) coneflower, burnet, *Amsonia*.

There are four broad evaluation criteria:

- 1) Cultural adaptability to the cultural and environmental conditions of the site,
- 2) Winter hardiness and adaptability,
- 3) Disease and pest resistance,
- 4) Ornamental traits related flowers, foliage, and habits.

Cooperative Evaluation Trials

We have longstanding relationships with a variety of commercial cooperators including:

Plant introduction programs and nurseries

- Donated plants,
- Source of new and older plants—often the starting point for a comparative trial,
- Plants are typically introduced but often not yet readily available,
- Do not always have control of everything that is sent for trial, which results in plants that do not fit into a comparative trial,
- Annual evaluation results are reported to cooperators.

All-America Selections perennials trial

- New national program began in 2016,
- Plants are evaluated in a three-year trial cycle,
- Annual evaluations contribute to AAS winner status.

Plant breeders

- Less common these days due to breeders/companies doing their own trials,
- Has always been a challenge because our gardens are open to the public.

Botanical gardens and arboreta

USDA—NC-7 Regional Ornamental Plant Trials—woody plants only

Plant societies, such as American Boxwood Society and Holly Society of America

Green Roof Trials

The Garden has been evaluating herbaceous and woody plants for green roof culture since 2010, utilizing two distinct green roofs on our Plant Conservation Science Center (Figure 3).

The goal of the green roof trials is to add taxa to a national compendium of plants grown on extensive to semi-intensive green roofs.

The goal of the green roof trials is to add taxa to a national compendium of plants. One 8,000 square foot green roof features North American native plants at the species level and with minimal maintenance provided. The result is a wilder or more naturalistic landscape.

The other 8,000 square foot green roof grows native and exotic plants including cultivars. This roof has increased maintenance to keep plants in place for a more garden-like display. The green roofs are used by graduate students working on various projects related to pollinators, plant communities, ant populations, and “soil” microbes.

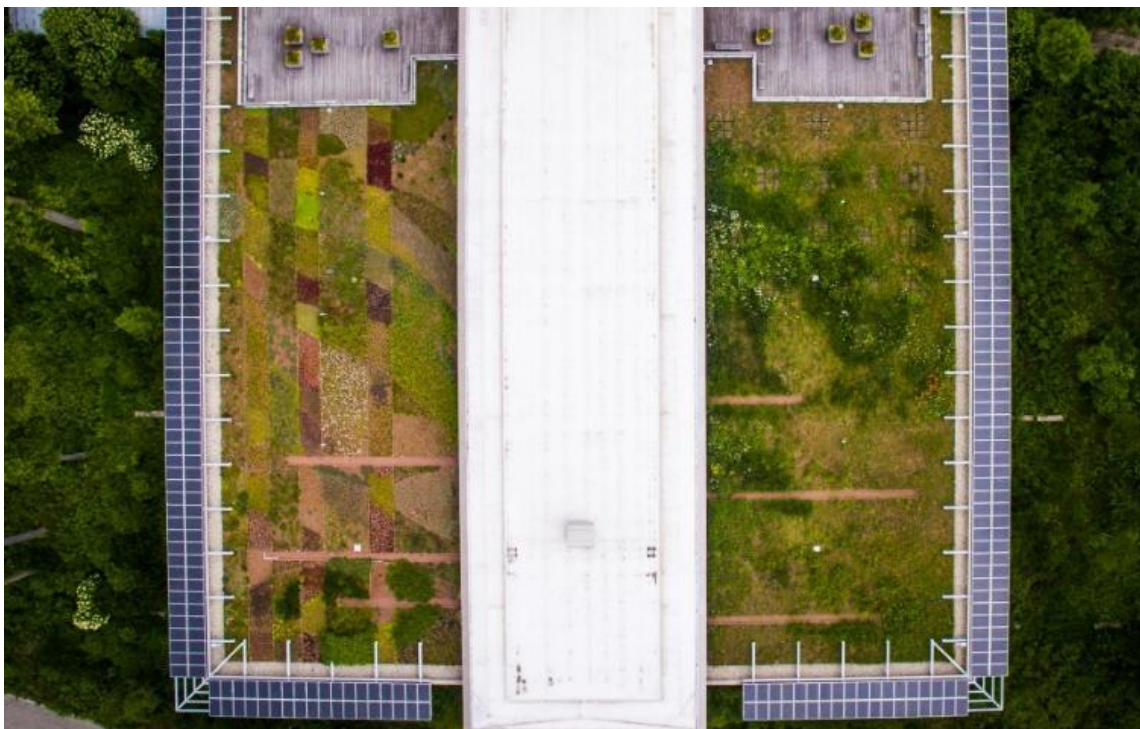


Figure 3. Two distinct green roofs on our Plant Conservation Science Center (Figure 3).

Plant Exploration Program Trials

The Chicago Botanic Garden in collaboration with other botanical institutions has participated in national and international collecting projects. Plant exploration programs trials include: South Korea, China, Altai Republic/Central Siberia, Russian Far East, Republic of Georgia, Uzbekistan, United States (Ozarks, Southeast, and Black Hills).

We target geographic regions with plants that are adaptable to our current and future climatic and growing conditions. Plants from international expeditions undergo a weed risk assessment process; taxa that don't get a pass or fail determination must be trialed.

Invasive Plant Trials

Invasive plant trials undertaken include numerous taxa from international collecting trips as well as common garden plants. A weedy designation has always been part of the evaluation criteria but considering the potential invasiveness of any species is essential. Examples of invasive trials we have completed are *Buddleja* for reseeding potential; *Miscanthus* for invasive potential based on seed viability; *Persicaria* (*Fallopia* and *Polygonum*); and wild-collected exotic taxa that dropped out of the weed risk assessment process.

Special Evaluation Projects

Periodically, we initiate projects that are independent/outside the scope of the comparative or cooperative trials. Examples of recent and upcoming special projects include 1) tender perennials used as annuals; 2) comparative trial of various umbellifers (not a genus trial); and 3) nativar project that observes pollinators on specific native species and related cultivars and hybrids. Nativar projects include black-eyed Susan (Figure 4), wild geranium, smooth penstemon, New England aster, and aromatic aster. Project participants include Chicago Botanic Garden, Denver Botanic Garden, Mt. Cuba Center, and San Diego Botanic Garden.



Figure 4. Example of a Nativar project looking at black-eyed Susan.

Results and Reporting

Reporting evaluation results through publication and outreach is important throughout the term of a trial (Download at www.chicagobotanic.org). Our primary publication is *Plant Evaluation Notes*, which is a periodic publication of Chicago Botanic Garden, and focuses on completed trials.

A long-running feature in *Fine Gardening* reports on our trials, both on-going and completed. Additional reporting is published in various garden and industry journals and websites, and through outreach via lectures, tours, and classes (Figure 5).

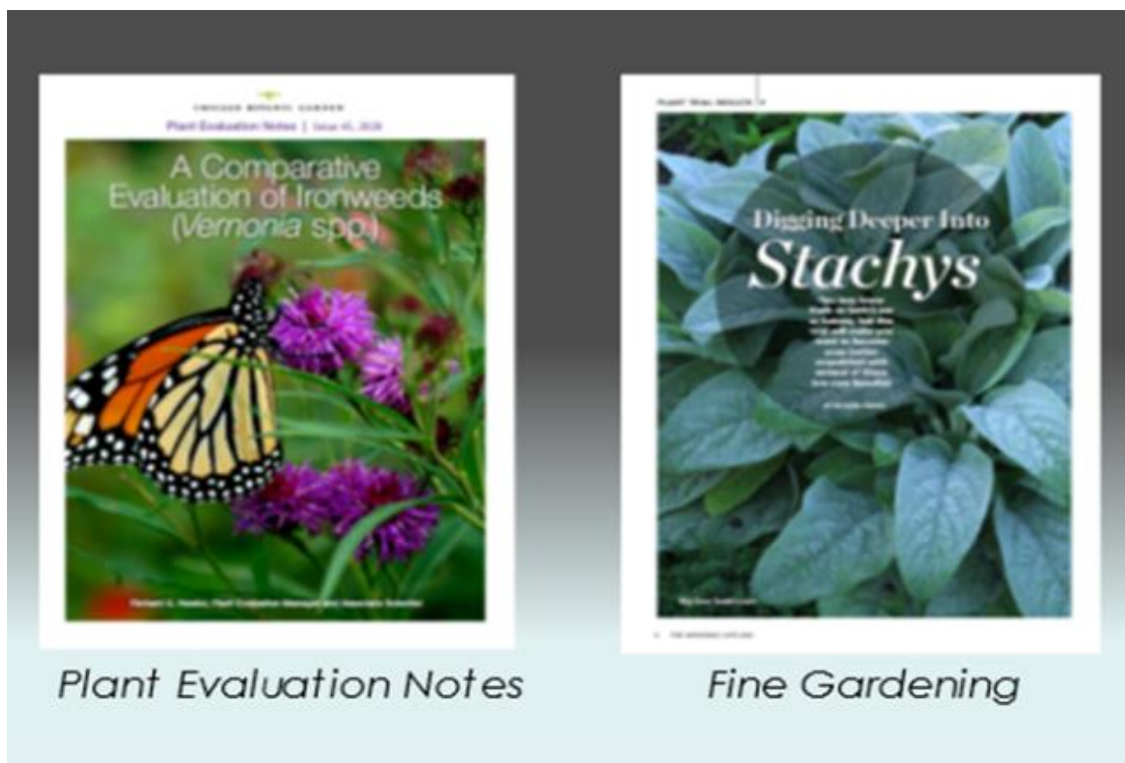


Figure 5. Two examples of reporting evaluation results through publication and outreach.