The largest collection in the Western Hemisphere of cycads – our planet’s oldest seed plants – continues to develop as a major world resource.

BG-BASE’s US and UK directors take a look back at the evolution of their biological collections documentation software now used by 188 institutions worldwide.

Learn more about the extraordinary effort, now in its tenth year, to log native seed collections using special software linked to a national data management system.

The flexibility and accessibility of online courses enhance the learning experience for instructors and students at Longwood Gardens. A framework for success is shared.

The podcast producer at the Shiloh Museum of Ozark History shows how easy it is to start a podcast that will strengthen the impact of your programs, exhibits, and interpretive materials and expand your audience.

The New Media Lexicon
Nick Leshi
From “blogs” to “tweety,” test your knowledge of some of the latest new media lingo.

Harnessing the Power of Social Networking
Sabina Carr
Atlanta Botanical Garden harnessed the power of YouTube, Facebook, and blogging to improve exposure, increase visitation, and measure results.

A Conversation about Two Small Gardens’ Adventures in Digital Marketing
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Two pioneers in social media at their gardens show how small gardens can integrate social media and e-newsletters to build membership and attract visitors.

The utility of digital tools

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TO THE BEAUTIFUL DETAILS

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H.O. Smith Botanic Gardens in the Arboretum at Penn State. Sculpture: Stacy Levy. Architecture: Overland Partners

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OASIS DESIGN GROUP

Phipps Conservatory and Botanical Gardens
Interior Conservatory Landscape Design
Pittsburgh, PA

To showcase the glass sculptures of Hans Goedde Fritzel, OASIS Design Group collaborated closely with the Fritzel and Phipps’ staff to develop a landscape environment that would be a quiet background to the glass. The landscape environment was custom designed around Fritzel’s sculptures that were strategically positioned to capture the essence of individual glass pieces or groupings. OASIS used neutral colored upland plants emphasizing foliage texture, shape, and size to accent the art and not compete with it. Many different plant textures and shades within the Fritzel exhibit complement the beauty of Phipps’ architecture and permanent plantings.

Designing the Fritzel exhibit was an OASIS project that illustrated one of the firm’s philosophies of practice—combine art and horticulture in the landscape to create memorable places.

www.oasisdsgn.com
410-732-1910
It is amazing how much technology has transformed our lives in just the last twenty-five years. Nearly anything we could ever want or need is just a click away, and yet, public gardens continue to be places where we interact with nature in a setting that is generally free from the technological trappings that are so common in our everyday lives. This raises an important question for gardens. With future generations being brought up with technology as an integral part of the way they see the world, how can public gardens create an experience that integrates the technological expectations of young people, while also maintaining the important interaction between people and nature that exists in public gardens?

This issue of Public Garden explores ways in which today’s gardens have adopted new technologies to enhance the visitor experience, engage new audiences, build and manage collections, and increase educational opportunities. Similarly associations like APGA are finding themselves looking for ways to embrace emerging technology as a strategy to provide value to their members through enhanced networking opportunities, educational experiences, and information sharing.

At APGA, we have begun a process of looking at new technologies and their applicability to our membership. This year, we offered our first-ever webinars, and a live video stream of the Grounds Management Symposium’s keynote address. We developed an online newsletter, and used Facebook as a tool to raise awareness of National Public Gardens Day. However, we believe there are even more ways we can leverage emerging technologies to provide value to you, our members. Over the next year, we will be taking a comprehensive look at how we can better enhance your membership experience through the use of technology.

In addition to using technology as a tool to run your association better, we also think it is extremely important to provide you with information on how you can leverage technology to improve your own operations. This issue of Public Garden is but a first step in that direction. It contains lots of good information about how gardens are using technology to reach the public, and future issues of Public Garden will contain a department dedicated to the use of technology. The APGA will host an education symposium on February 5-6, in Orlando, Florida. This symposium will include sessions on how to use technology as an interpretive tool at your garden. Visit the APGA web site for more information.

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Sketch: Compass design for the Toledo Botanical Garden

How a cemetery revived a community

Once Upon a Time...
A CEMETERY STORY
by Jane Baber White

"the old cemetery restored as a garden, sustained by its neighborhood, with its roses, its chapel, and its cats that mourn"

—Vincent Scully

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1-877-447-1944
www.visualopathy.com
Like many cultural heritage institutions, Longwood Gardens maintains image and audio-visual collections used internally for everything from marketing to presentations, publications, and archival documentation. In 2007, we launched an institution-wide visual resource management project to determine how best to manage those resources in an electronic environment. What follows is an overview of our technology selection process, future directions, and a couple of lessons learned.

**Lesson One: Stakeholder needs define the project goals. Project goals define the technology.**

Given the importance of visual communication in landscape architecture and horticulture, and given we have many thousands of images in varying formats, in varying locations, and in varying degrees of accessibility, it was logical for Longwood to devote a project to improving access to its images. A twelve-person cross-departmental team was created to conduct a needs analysis and define functional requirements for the selection of a Digital Asset Management (DAM) system designed for image management. For the needs analysis, we used an ideation tool called an Affinity Diagram to generate and collect ideas around the question: *What does the institution need to effectively manage, enable use of, and preserve image-based materials?* Five general questions for each team member followed:

- What images do you currently have?
- How do you use these images?
- How do you manage these images?
- What can you currently do with these images?
- What would you like to be able to do with these images?

The answers the group composed to those questions in a three-hour time span first became our project goals, and then the functional requirements of our Request for Proposals (RFP). We then repurposed our functional requirements, using them to develop yes/no criteria for evaluating systems. DAM systems all tend to offer similar basic functions. Core functions include adding images to the system, doing data entry, and then searching and retrieving those same images. The real question for software selection then becomes: *How well does this system serve its intended purpose?* To narrow the selection pool, we therefore returned to our project goals, noted a strong need for a system that everyone could easily use, and thus chose to distinguish the systems based on their usability and flexibility in meeting our unique needs. Jakob Nielsen (2005) offers a basic set of usability heuristics that can be invaluable when used in a group for “quick and dirty” (and effective) interface usability evaluations.
Lesson Two: Ease of use promotes a blend of centralized and decentralized system management.

Longwood staff recognized the benefits of an easy-to-use system, and also recognized an opportunity to develop collaborative potential through shared data entry. Sharing data-entry efforts across organizational staff is one of our project goals, and is a way to achieve shared ownership while maximizing staff expertise. And there are risks to a more open, collaborative approach. A system with a good set of permissions controls can, however, allay many of the risks and challenges of decentralized management. For instance, if a centralized system management team is the only group able to delete images from the system, much risk is avoided. Most of all, it is important to understand the power and value of accurate data in image retrieval and use, as well as the time and skill required to create it. A collaborative blended approach can help to achieve data creation as well as data accuracy.

Finding a DAM system that will support this collaborative management approach is another matter, especially across a diverse user group of subject specialists (e.g. designers, horticulturists, performing arts staff, graphic designers), in addition to the librarians and photographers toward whom most DAM systems are geared. After reviewing eight leading DAM systems in our collections niche, we decided on Asset Bank from Bright Interactive, a UK-based company. We needed a system flexible enough to meet the needs of a decentralized management group of staff doing specialized data entry and image uploads, while still supporting centralized management for general tasks including setting security and rights permissions, managing users, performing software updates, and general administration. Asset Bank has met that need, and with a surprisingly straightforward and deceptively simple interface – it has allowed us to successfully train nearly thirty non-library staff to do image uploads, data entry, and more.

Future directions

The future of Longwood’s digital image management project is bright. Through efforts to clearly identify and meet the institution’s image management needs, our team was also able to identify ways to improve workflows, expand the potential for outreach, and increase the capacity for collaboration both internally and with other institutions. As we move forward with a visual resource specialist, scanning technology, the Asset Bank DAM system, and an established project plan, the true success of the project is beginning to emerge: beyond being on time and on budget, the project is generating enthusiasm and anticipation across the Gardens, as evidenced by the number of new initiatives growing out of the original project scope. Building largely on the technological foundations now established, we look forward to addressing those new initiatives and taking this project in new directions.

References


Venice Bayrd is the information services coordinator at Longwood Gardens in Kennett Square, Pennsylvania. For more information on visual resource management, you can contact Venice at vbayrd@longwoodgardens.org.
Since the establishment of the world’s first botanical gardens in the sixteenth century, maps have played an important role in the documentation of the living plant collections at these scientific institutions. Originally used as a tool for curators to track and manage their collections, botanical garden maps have evolved into a comprehensive tool for information management and decision-making that can be used at all levels of institutional operation. Today’s enterprise mapping systems can integrate information from plant records databases, asset management systems, image archives, and many other information sources to create a seamless environment for fund raising, planning, management, and education.

The digital mapping systems employed by today’s botanical gardens fall into two major categories: computer-aided drafting systems (CAD) and geographic information systems (GIS). CAD-based systems such as Autodesk’s AutoCAD software and BG-Map provide specialized graphics tools for the creation and manipulation of electronic drawings. These digital drawings can have multiple layers (e.g. roads, irrigation systems, plants) that can easily be displayed or hidden, as needed. Sometimes linked to external databases, like Access or BG-Base, CAD systems can produce accurate digital collection maps that are easier to edit and keep up to date than paper-based maps. GIS software such as ESRI’s ArcGIS and open source solutions (e.g. Quantum GIS) take the concept of the digital map a step further by integrating each graphically rich map layer with the information storage and querying capabilities of a database.

Both approaches, when tied to rich data sets, result in “smart maps” that can contain a wealth of information about plants and other site features. Unlike CAD, GIS maps can also be used to perform complex analyses such as determining the best location to site a new microclimate-sensitive exhibit or the most efficient emergency evacuation plan. Finally, “internet mapping,” a relative newcomer to the digital-mapping scene, is emerging as a useful device, as illustrated by the new tool, PlantMapper. This technology uses the free online aerial photographs and maps supplied by Google Maps as a base map. Curators place digital points or tags, which can be labeled and linked to data sets on the maps to highlight the location of key specimens or site features. What this technology lacks in the accuracy of CAD and the information storage and analysis capabilities of GIS, it makes up for in simplicity and cost-efficiency.

At botanical gardens, digital mapping tools are mostly used to produce simple collection maps. These maps typically include only the locations of living plant specimens, along with major landscape features such as buildings and pathways. However, an enterprise mapping system is the future of digital mapping. It extends the value of maps across the organization, as multiple garden departments incorporate all records into one integrated system. For example, educators might map exhibits and tour routes, plus note educational information about specific plants and exhibits in the linked database. In the same system, facilities managers
might map utilities, roadways, and critical infrastructure, and link work orders, purchase orders, and digital instruction manuals to mapped features (e.g. irrigation control boxes); curators can link PDFs of scientific papers or herbarium images to mapped specimens, and the base map itself might integrate complex site data, often available for free from national data sources, about soil, water, and topography. Some nonprofits even use GIS to analyze the demographics and addresses of their membership list and then design targeted fundraising drives to reach likely new supporters. The limits of the information an enterprise mapping system can contain are constrained only by the availability of existing data or the resources to capture and integrate any needed new data.

Most botanical gardens do not have the funding, time, and trained staff to develop a full-fledged enterprise mapping system; however, there are a number of resources available to get started. Grants are a great way to fund the launch of your mapping project. Organizations like the Institute of Museum and Library Services (IMLS) fund mapping projects if you demonstrate the benefits of the end product to the larger community. If you choose GIS as your mapping system, ESRI, the world leader in GIS software, has partnered with the American Public Gardens Association (APGA) to provide free software and training grants to public gardens that maintain APGA institutional memberships. If you have a committed staff person to serve as a leader, student internships and volunteers are a great way to cut the costs of mapping the garden and the collection; digital mapping skills are highly marketable skills, so recruitment is easy. Get to know the GIS professors at your local community college or university, and explore the idea of a formal internship program with them— you supply the real-world problem, and they and their students provide the solution. If you need additional training in digital mapping, the APGA periodically offers workshops at their annual conference that provide hands-on experience with various mapping systems and data-capture methods. The Alliance for Public Gardens GIS (APGG) is a nationwide group of zoo and botanical garden staff that is working together to develop the ArcGIS Botanical Garden & Zoological Park Data Model, a free and open source template for launching an enterprise mapping system. The APGG also hosts a Google Groups user community for zoo and botanical garden staff to share information and questions about digital mapping with their peers. To learn more about each of these resources, refer to the web sites listed below.

**Resources**

Institute of Museum and Library Services (IMLS)  
http://www.imls.gov

Alliance for Public Gardens GIS  
http://www.apgg.org

Autodesk  
http://www.autodesk.com

BG-Map  
http://www.bg-map.com

Environmental Systems Research Institute (ESRI)  
http://www.esri.com

ESRI-APGA Software Donation Program  
To receive more information about this program, please send a blank e-mail to apga@esri.com.

PlantMapper  
http://www.plantmapper.com/

Quantum GIS  
http://www.qgis.org

Mary Burke is the director of planning and collections at the UC Davis Arboretum.  
Brian Morgan is the GIS manager at the UC Davis Arboretum and a lead member of the Alliance for Public Gardens GIS (APGG).
The New York Botanical Garden recently implemented a new technology called cell blogging as part of its exhibition, "The Edible Garden." Without it, a woman from Rochester would not have been able to share an emotional moment from her childhood: "I grew up in an Italian-American family, and when I was a little girl, my grandpa and I used to go out in the fields and dig up cardoons. We would bring them home, boil them, and peel them, and then my mom would fry them up. It is delightful to see something so beautifully displayed in your garden and to evoke such a beautiful memory of my grandpa."

Cell blogging—created by the California-based company Guide by Cell—offers the Garden a chance to hear stories like this one directly from its visitors, and for visitors to hear stories from each other; consequently, it is changing the way that patrons communicate with the Garden. This is how it works: after calling the audio tour number and listening to a prompt, visitors are asked either to leave a comment—simply by pressing a key and speaking—or to listen to other visitor comments. Administrators can then incorporate the most compelling and relevant ones into the audio tour. The New York Botanical Garden is the first public garden in the country to use this form of visitor communication.

What’s great about cell blogging is that there is virtually no cost to the visitor, except for cell phone minutes, and no equipment to take care of since visitors use their own phones. The cost for cell blogging is cheap, just twenty-five dollars a month in addition to whatever you pay for your cell phone tour. Staff commitments are also minimal. It takes just one dedicated staff person a few minutes each day to listen to and approve tour comments through the Guide by Cell administration web page.

Cell blogging is a networking tool which demonstrates that the lives of visitors overlap—with each other and with the collective life of the garden. It also helps to facilitate dialogue, giving people a chance to participate in directed discussions on related topics. During "The Edible Garden"—an exhibit that celebrates the diversity of edible plants and the benefits of growing great food—visitors may use cell blogging to share stories and traditions about edible plants (like corn, cardoons, and sage) or about their own families’ gardening traditions. They then have the opportunity to listen to stories on the same topic from others.

In this way, patrons get to be teachers—to share family wisdom and valuable cultural knowledge. This process expands the educational knowledge the garden has at its disposal by tapping into a previously untapped resource: its guests. Hence, the institution is not only providing facts and educational messages; with cell blogging, "The Edible Garden" is open for discussion. To join the conversation, call our audio tour number: 718-362-9561.

Jessica Blohm is the interpretive specialist at The New York Botanical Garden.
Podcasts are audio files available on the Internet for downloading. Podcasts are an easy inexpensive way to provide interesting content to a wider audience, even for a small institution. By being creative about how podcasts are produced, institutions can expand the impact of programs, exhibits, and interpretive materials.

How much time does it take and what’s inexpensive? Our experience as a relatively small institution with a number of part-time staff serves as a good example.

Time

Save time and resources by looking at what your institution is already doing. Shiloh Museum of Ozark History has a monthly lecture series, but not everyone can come to every lecture. Podcasting these programs allows us to reach a much wider audience. These programs are not time-consuming, since they are recorded in one take during the presentation, and little post-production editing is needed. We also post PDF versions of our newsletters and annual reports on our podcast feed, allowing content we’ve already spent time and money producing to pull double duty.

Our podcast is also a great way to share news and activities that might not be appropriate for public events. For instance, when Caddo Indian representatives came to reclaim remains from us in accordance with Native American Graves Protection and Repatriation Act (NAGPRA), they were gracious enough to agree to an interview. Although their visit was not appropriate as a public event, podcasting made it accessible to our patrons, and it became a great opportunity for the public to learn about NAGPRA. We have also used our podcast as another outlet for Public Service Announcements (PSAs) and other special announcements.

In addition to traditional exhibit audio tours, podcasts can provide supplements for temporary exhibits. When you have more information than can be included in an exhibit, why not use the extra material for a podcast? For example, we have used excerpts from our oral history interviews as first-person accounts to supplement exhibits.

We also examine our education programs for potential podcast content. For some schools, especially in rural areas, the cost, time, and logistics of physical visits can be prohibitive, so podcasting can provide a way to reach those students. We did an eight-minute video tour of a new exhibit to provide access to those who could not come, and to pique the interest of those who could.

Podcasting is a team effort. We have thirteen staff members, five of whom (including me) are part-time. Many of our lecturers are guest speakers, which saves us time in research and writing. We ask our volunteers to read through our interview transcripts looking for specific topics for us. Everyone comes up with content ideas. Our Outreach Coordinator creates the artwork, writes the descriptions, and uploads the episodes to our web site. I edit all the episodes, and can usually listen to them while cataloging artifacts (my main responsibility). Sharing the workload helps prevent burn-out and stress, but it also lets everyone participate in an exciting program.

Be realistic. Set definite goals and stick to them. There is a learning curve, so allow plenty of extra time at first. Our initial goal was to produce a new episode a month, which we felt was realistic for us. In two years, we have become more proficient and have been able to produce content on a weekly or bi-weekly basis.
Whatever goals you set, be sure to let the public know what to expect. We were open with our community when we started podcasting by discussing the project on our website and in our newsletter. We asked the public to be patient with us as we learned, and they were. They even sent encouraging letters about this new technology we were exploring.

Cost

Know what equipment you already have. All you need is a good-quality microphone, a computer with the ability to record, and an application to do the editing and transformation to an MP3 file. When we started, we plugged our PA system directly into our laptop, then recorded and edited the presentation with a free program called Audacity. Mac users can use GarageBand to do the same thing.

Staff time. This can be an expense in podcasting, but does not have to be. Volunteers can help. Also, since there is a learning curve, your efficiency will improve over time. Most experts estimate that it takes several minutes of editing for every minute of audio recorded.

Look for free services. We use a free blogging service (Blogger.com) and a free feed-formatting/statistic-tracking service (Feedburner.com) to publish our podcast as well as providing links on our institution’s website. The city of Springdale provides server space, necessary for podcasting. If you do not have server space available, there are reliable free providers.

Invest in equipment that can multi-task. After we had been podcasting for about six months, we decided to record two symposia at the museum. Recording five one-hour lectures back-to-back proved difficult with our laptop, so we decided to invest in a stand-alone digital recorder for around six hundred dollars. This has been the biggest purchase for our podcasting program, but we also use it to record oral history interviews in the field. USB microphones can also be added.

Results

Since we started podcasting, we get inquiries from people unable to attend lectures asking if these events will be podcasted. At least once a month, we have visitors who specifically mention they are avid listeners who decided to visit because of the podcast! Often these new patrons are college-aged or young professionals—demographics we often miss. One of our college-aged listeners even became a volunteer.

Even on days with few visitors, we always have downloads, and our daily average is around thirty.

We also receive e-mails from around the state and country regarding our podcasts. A few of these e-mails are from people who have moved out of the area for whom the podcasts are a way to reconnect to their roots. The best compliment we have received was from a listener who said, “When I listen to your podcast, I don’t feel so homesick anymore.”

Conclusion

Podcasting can be an excellent way for museums, libraries, and gardens to attract new visitors, make programs available to visitors at their convenience, accommodate different learning styles, and reach wider audiences geographically. For further information on equipment suggestions and ways to budget, please visit http://hmbwells.googlepages.com/.

Heather Marie Wells is the collections assistant/podcast producer at the Shiloh Museum of Ozark History, a small to mid-sized regional history museum located in Springdale, Arkansas. The Museum launched its podcast program in 2006 (the first museum podcast in the state of Arkansas), and has since won the Arkansas Museum Association 2006 Adult & Family Educational Program of the Year and the American Association of Museums Media & Technology Committee 2008 Bronze MUSE Award. Wells was named the 2008 Emerging Museum Professional of the Year by the Southeastern Museums Conference.

Examples of current garden podcast programs

San Francisco Botanical Garden’s Botanical Bzzz podcast offers insight into their events and exhibits, and they use episodes to highlight their volunteers and supporters.

Brooklyn Botanic Garden has two exhibit tours on their podcast feed; their content works well even outside of the exhibit.

Missouri Botanical Garden offers at least seven different podcast feeds ranging from specific exhibit tours to their annual orchid show and an index of what plants are in bloom.

Royal Botanic Gardens Cranbourne in Victoria, Australia, covers everything in their podcasts. Listeners learn about the research taking place, how the garden is governed, what to expect when they visit, activities available, the history of the garden, and more.
How We Did It

CAROL CAPOBIANCO

How We Did It: Our First Year Producing a Blog

The New York Botanical Garden’s blog, Plant Talk, reached its first anniversary this past summer. I use the word “reached” because publishing original content five days a week without a staff dedicated to that purpose is indeed an accomplishment.

The key to our achievement—and to the blog’s continuation—has been in our approach and our commitment to making it a success. Today, we have the respect and following of Garden staff, who use the blog as a way to learn what’s going on elsewhere at the Garden; we’re getting pickup from other blogs and websites; and we’re promoting the blog through daily tweets (via Twitter) and occasional blasts to targeted media.

Whereas in the beginning days we were scrambling to find writers, depending heavily on two summer interns for copy, now, with a clearer understanding of what we want to achieve, we have a steady flow of contributions. As of this writing, a few weeks into our second year, we had posted blogs by more than eighty different people, including staff from around the Garden, students and instructors in our Continuing Education program, featured event speakers, and even our president, Gregory Long.

How We Went About It

When a year of talk about producing a blog gave way to a few weeks’ worth of trial blog entries, reality set in. We quickly realized that since Plant Talk (the name was tossed about for a while before settled upon) was an institutional blog, not a personal blog, it needed to reflect the high standards of the Botanical Garden and be written by more than one voice.

The entries would need to be edited (some people were aghast at this thought, but it’s necessary for accuracy, grammar, and clarity), topped by clever headlines, and examined for appropriate content. A story schedule and writers would be needed to continually feed the blog. Photos would be needed to illustrate the stories. Clearly, running a blog would be a job for staff with experience in producing content. The questions of who, what, when, and how needed to be answered. And so a team
comprised of staff from Editorial, Public Relations, Creative Services, and Public Education was appointed to direct the content of the blog.

The team immediately drafted a mission statement, institutional goals, and writer’s guidelines that set the tone and direction of the blog. The mission keeps us on target: We aim to promote the Garden and its work but without a “hard sell” and to offer fun, interesting stories that before had no venue. We decided to tap into all our resources at the Garden and provide inside stories on a broad range of topics from a large field of contributors.

We urge our bloggers to write three hundred to four hundred words from a personal point of view and in language understandable to the layperson. Each entry is accompanied by a headshot of the writer and a brief byline telling who they are, what they do, and any other pertinent information; this personalizes the stories even more. What’s nice about using many different contributors is that they each introduce a new group of readers—their own personal fans—to the blog. The bloggers cross-pollinate on their own Web sites or blogs, which increases readership of Plant Talk. For instance, the Continuing Education registration pages link to appropriate blog entries so that when a potential student goes to sign up for a class in that discipline, she can click and read about a related experience.

Other benefits of the blog have been to reach out to a potentially younger audience; to showcase the people, plants, programs, and scientific research of the Garden; to promote further media coverage of the Garden; to draw traffic through online search engines; and to create a dialog with visitors through comments and other reader interaction. (e.g., we’ve asked readers to vote for their favorite type of orchid using a widget function.)

Besides written entries that are usually accompanied by a still photo, periodically we post vlogs—video blogs—which are always popular. Topics have included seasonal segments on what’s in bloom at the Garden, how-to information such as caring for orchids, and a tour of the Henry Moore sculpture by a knowledgeable guide. When time doesn’t allow for a video, we post slide shows of several still photos, such as we have done for some fundraisers or special exhibitions. And each week we have a regular feature: a gardening tip of the week from our Gardener for Public Education.

In many ways a blog is like running an online newsletter. The biggest challenge is finding writers to provide content. For those times when a story doesn’t come through as planned, we try to have “evergreen” pieces on hand such as a profile of a plant in our collections or current exhibition with text from interpretive signage.

In terms of staff resources, I estimate that the administration (scheduling, meeting, editing, finding photos, reviewing, uploading) of the blog adds up to about forty to fifty hours a week. Add to that the amount of time each contributor takes to write an entry and resolve any editorial questions, and you have the total time required.

We are continually looking for ways to further streamline and simplify the process, to promote our rich content, and to attract new visitors. As we get settled into our second year, I’m confident we’ll reach those goals and continue to grow.

To check out Plant Talk go to http://www.nybg.org/wordpress

Carol Capobianco is editorial content manager for The New York Botanical Garden. She heads up the team responsible for the institution’s blog, Plant Talk.

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Some other APGA member institutions that have blogs

**Denver Botanic Gardens**
http://www.botanicgardensblog.com/

**University of British Columbia Botanical Garden**
http://www.ubcbotanicalgarden.org/gardenblog/

**Daniel Stowe Botanical Garden**
http://danielstowebotanicalgardenblog.blogspot.com/

**Cleveland Botanical Garden**
http://www.cbgarden.org/blog/

**Lewis Ginter Botanical Garden**
http://lewisginter.wordpress.com/

**Fairchild Tropical Botanic Garden**
http://www.fairchildgarden.org/livingcollections/blogs/
Blog: A Web-based online journal that is easy to update, requires no programming, and allows readers to add their own comments.

Blogosphere: All blogs, or the blogging community.

Blogroll: A list within a blog, usually in a vertical menu along the side, that links to other blogs.

CGM: Consumer-generated media (CGM) describes word-of-mouth behavior that exists on the Internet in the form of blogs, video, audio, or social networking content created by consumers and the general public rather than by media professionals, businesses, or marketers.

Digital: A digital signal is a language of 1s and 0s that can be processed by mathematics, available in electronic form; readable and manipulatable by computer.

Digital Assets: Any form of content and/or media that has been formatted into a binary source which includes the right to use it.

Feed: Also known as Web feeds or blog feeds, a feed is a widget that contains content items, often summaries of stories or blog posts that include Web links to longer versions. Feeds are subscribed to directly by users with aggregators (or feed readers that combine the contents of multiple Web feeds for display on a single screen or series of screens).

Hits: Measurable interaction with each element of a Web site (graphics, text, links, interactive content, etc.).

Home Page: The main point of entry or the main page of a Web site.

Page Views: Also called Page Impressions, measuring how many times a Web page is seen by a user.

Podcast: Audio (and sometimes video) content that can be downloaded to iPods or other MP3 players, or accessed online.

Podcasting: The method of distributing multimedia files, such as audio or video programs, over the Internet using syndication feeds.

RSS: Really Simple Syndication. A form of programming that allows end-users to subscribe to Web sites or blogs and have updates fed to their Newsreader automatically. The content can be anything from small bits of information to press releases or entire blogs.

Social Media: A common term used to encompass the current Web trends, online tools, and available platforms that allow users to share information, opinions, and experiences with other users (e.g. Facebook, Flickr).

Social Networking: Services that allow members to connect with each other for sharing, collaborating, and networking.

Tag Cloud: A visual depiction of content tags used on a Web site. Selecting a single tag within a tag cloud will generally lead to a collection of items that are associated with that tag.

Tags: Tags are basically used as categories or subjects in Web logs. Tagging makes it easier for people – and blog search engines – to organize and look for information in the right places.

Thread: A series of posts on a single topic.

Trackback: A piece of programming that shows bloggers who is linking to their blogs and delivers snippets of what was said.

Vblog or Vlog: Video blog. A blog that uses video as its primary content. The video is linked to a post and is usually accompanied by supporting text, images, and additional metadata to provide context.

Visits: Commonly referred to as a User Session, it is all the activity performed by one user on a Web site.

Widget: A third-party item that can be embedded in a Web page and executed within any separate Web page without requiring additional compilation. A widget can be compared to a plug-in desktop operation.

Wi-Fi: The abbreviated form of Wireless Fidelity — the technology that allows laptop computers to wirelessly connect to the Internet, among other capabilities.

Nick Leshi is the associate director of public relations and electronic media at the New York Botanical Garden. He compiled, edited, and wrote the above list using the following Internet resources: Dictionary.com, OgilvyPR.com, Centric.com, NetLingo.com, Wikipedia.org, and YourSocialMediaScore.com.
Harnessing the Power of Social Networking

SABINA CARR

You hear about it all the time – social networking. How can we use it to best impact our garden’s visibility and bottom line? Today, thanks to the power of the Internet, social networking has expanded beyond schools, clubs, sports and similar organizations and exploded onto thousands of Web sites. It’s become an important new tool by which we can market our institutions in exciting and creative ways to reach out to new audiences.

According to one blogger, “…social media sites have become ubiquitous, and it’s impossible to ignore their power to help users of all sorts communicate frequently and in real time with fellow users or members.” Once an online obsession for teens and Gen Ys, social networking has now attracted older generations. With hundreds of millions viewing sites like Facebook, Flickr, Twitter, LinkedIn, and YouTube, and reading and/or writing blogs every day, it was only natural for these networks to expand to include organizations and individuals looking for networking and marketing opportunities.

The biggest challenge for any professional wanting to use these sites may be in figuring out how best to do so. As a marketing tool, social networking is still relatively new. There are no ground rules or even loose guidelines for successfully connecting your organization—or yourself—with your target audience through online social media. The Atlanta Botanical Garden wanted to build this marketing tool over time and measure results to track our success. We knew this could be a great way to build new communities that love our organization and want ways to express it. For a small investment in money and a bigger one in time, our goals were to harness its power to impact our organization with improved exposure, increased visitation, and a greater return on investment that measures its success.

**YouTube**

At the Atlanta Botanical Garden, we began our own relationship with social networking when we launched our first YouTube channel last year. YouTube is the most popular Web site devoted to sharing videos created by anyone and everyone. Forbes.com writes that the young founders of YouTube soon discovered it “wasn’t just a video-sharing Web site—it was a portal, an addictive time-sink, a monumental marketing platform, and a public commons, all rolled into one attention-deficit-disorder-friendly format.”

We launched our channel during the "Sculpture in Motion" exhibition in May 2008 as a way to show the beautiful kinetic sculptures being swayed, undulated and moved by the natural elements of wind, solar, and water. We created links from the garden’s exhibition page directly to YouTube so people could experience the captivating nature of kinetic sculpture, something we couldn’t afford to do with traditional television advertising. Later that fall, we added the burning of our native bog gardens on the channel which attracted much viewer interest.

All it took to get started was a web-savvy staff member investigating the YouTube site’s information on how to create a channel. It’s free; you just have to have some great video ready to post.
Facebook

The Atlanta Botanical Garden created its first Facebook page in summer 2008. With over 250 million users, Facebook is currently a primary social networking site. We started the page with only seven fans, and now, just twelve months later, we have over 2,000 garden fans. Although Facebook is free, we were fortunate to receive the pro-bono marketing services of a terrific interactive public relations agency to help guide us through setup and maintenance. But if you have a media-savvy person on your staff, they could easily manage these steps.

We grew the fan base by creating a Facebook Photo Contest to help launch a new Atlanta Botanical Garden exhibit, “Moore in America, the Monumental Sculptures of Henry Moore.” To enter the contest, people first had to become fans of the Garden’s Facebook page. Then they could submit their best photos of “Moore in America.” In just three short months, we had over eighty entries with more than 250 comments (i.e. “votes”) made. In return, the Garden now has the right to use these beautiful new photographs in perpetuity. This relieved our marketing budget of at least three thousand dollars towards photography for the show and increased our fan base by almost 50 percent from when the contest began in May 2009. To help drive visitation and revenue, we plan to offer special discounts exclusively to our Facebook fans in the near future. We have also just started “virtual scavenger hunts” on our page that invite our fans to learn more about the Garden in return for prizes, thus engaging them at a deeper level.

Blogging

In early 2009, we entered the world of blogging via “Moore in America” as a way to give people a behind-the-scenes look at what it takes to bring an exhibition of that caliber to Atlanta. We hoped to create dialogue and chatter among exhibit fans so that they in turn encourage others to come see it in person. To start our blog, we used a simple blogging tool called BlogSpot.com and focused on everything “Moore.” With a narrow focus we were able to easily fine-tune the blog in response to our readers. We found it successful to “blog” (write) once a week on different subjects including the installation, the artist and those who knew him, the curators, and more. People not only found the blog, but they started to pull photos from it to use on their own blogs or media outlets. Blogs are a great way to get out information about your site and to elicit public commentary. Just remember to adjust your blog settings to allow you to moderate those comments.

In some ways, social media is a bit of a “jungle” that takes time and skills to navigate but with enough effort can be tamed to your advantage! We plan to expand our presence in the world of social media over the years and will carefully track results in terms of increased visitation, participation, and perhaps even donations. For now we’re focused on it being a means by which people can have a conversation about our brand and feel connected with us. We highly recommend you harness the power of this interactive world – its easy, fun, and (mostly) free.

Sabina Carr is the director of marketing & communications at Atlanta Botanical Garden. She can be reached at scarr@atlantabotanicalgarden.org

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Sabina Carr is the director of marketing & communications at Atlanta Botanical Garden. She can be reached at scarr@atlantabotanicalgarden.org
Michelle Provaznik: Web sites are a critical first step to establishing a digital marketing program. Our web site, www.fcgov.com/gardens, is often the first impression made on a potential visitor. We strive to update the site at least once per week with new content about classes, events, and garden expansion. In addition, the Friends of the Gardens on Spring Creek recently launched their own web site that links to The Gardens’ home page. The primary purpose of their web site is membership and fundraising. For approximately two thousand dollars, a professional-looking web site was developed using a template with pages, outlines, and color schemes that can be adapted to any organization’s needs. This was a much more cost-effective alternative to hiring a web designer and starting from scratch. Feedback from supporters on the Friends’ new site has been extremely positive.

Our Garden’s web site is a portal to all of the other ways we connect with visitors and supporters. For example, we invite people to sign up for our e-newsletter to help build our database and will have a link to our Facebook page.

Sarah King: I agree that good web sites are fundamental! Bgozarks.org has a “join our eBulletin” link at the top of the navigation bar, and this alone drives several
A Conversation about Two Small Gardens’ Adventures in Digital Marketing

design and management. Our eBulletin is distributed within our web-based donor database program. In the days following an eBulletin’s release, I see spikes in traffic to our website and in online ticket purchases and membership renewals. A volunteer recently introduced me to MailChimp (www.mailchimp.com), which is more economical than the system I currently use. It also has more powerful analytical tools, is easier to use, and will allow people to sign up for the eBulletin directly from the website. I’m planning to switch to that program when my current e-mail contract ends. I was surprised when eBulletin content started appearing in newspapers—it seems that reporters and photographers like the fun-to-read, pretty format just as much as everybody else!

**MP:** That’s fabulous. I will make sure that I include our local media on our distribution list! We are now investigating the various social media forums. Don’t you have a Facebook page?

**SK:** Two years ago, we introduced a monthly HTML newsletter, produced and distributed within our web-based donor database program. In the days following an eBulletin’s release, I see spikes in traffic to our website and in online ticket purchases and membership renewals. A volunteer recently introduced me to MailChimp (www.mailchimp.com), which is more economical than the system I currently use. It also has more powerful analytical tools, is easier to use, and will allow people to sign up for the eBulletin directly from the website. I’m planning to switch to that program when my current e-mail contract ends. I was surprised when eBulletin content started appearing in newspapers—it seems that reporters and photographers like the fun-to-read, pretty format just as much as everybody else!

**MP:** That’s fabulous. I will make sure that I include our local media on our distribution list! We are now investigating the various social media forums. Don’t you have a Facebook page?

**SK:** We started using Facebook in March to promote events, recognize volunteers, and educate users about plants in bloom. It was very quick and easy to set up. At first, the page functioned only as a placeholder and gateway to our website. One benefactor who is an avid Facebook user encouraged us to have more of a Facebook presence. We approached her by offering a challenge—she donated one dollar for each new fan, up to one thousand fans. This quickly gave us a critical mass of local fans. As of early August 2009, fourteen hundred Facebook users follow our updates as “fans” of the Garden. One great advantage of Facebook is that “fans” are active participants—not just consumers of our messages, but producers as well. Facebook allows people who love the Garden to give first-hand testimonials to their friends—that elusive “word of mouth” has become “word of mouse” visible to a wide audience. In particular, the Fayetteville mayor has been a very supportive fan, helping with our drive for fans and re-posting Garden events to his network of four thousand friends. Maintenance of the Garden’s Facebook profile does require frequent tending, but it is not burdensome, and it’s fun! Part of the appeal is the immediacy of the response from fans.

**MP and SK:** Our adventures in digital marketing have proven to be effective communication tools for our emerging gardens. In conjunction with traditional marketing methods, they help spread the word about our gardens and the value we bring to our communities.
The first Seeds of Success collection was made on the sandy foothills of sagebrush steppe in the northern Great Basin in 2000. Since that day, Seeds of Success (SOS) has seen a dramatic growth in the number of collections. Currently, the National Collection includes 9,000 collections (of over 2,200 taxa). Specialized software linked to a national data management system has made managing these collections much more efficient and accurate.

In light of climate change, coordinated native seed banking efforts are increasingly important for maintaining and restoring native plant communities that are essential to the ecological services that humans and wildlife depend on. Wildland seed collection programs, such as SOS, are conserving plant diversity in seed banks for native plant materials development, research, and habitat restoration before it is lost.

SOS is the national native seed collection program, led by the Bureau of Land Management (BLM) under the umbrella of the congressionally mandated Native Plant Materials Development Program (NPMDP). The mission of SOS is to collect wildland native seed for the development of genetically appropriate native plant materials for restoration, as the current market does not supply the diversity and quantity of native plant materials needed. SOS is a partnership of federal government agencies and non-federal organizations working together to collect, conserve, and develop native seed. A high level of coordination and collaboration among partners is necessary for this program to be successful.

Piloting Electronic Field Notes
The efforts of sixty-five collecting teams across the US, based at numerous BLM offices and participating botanic gardens, are the foundation of SOS. Each collecting team follows the SOS Technical Protocol and uses standardized SOS field data forms. Collectors record and capture detailed collection site information associated with each collection in the SOS National Collection. In 2007, SOS and BG-BASE, Inc. developed the SOS Electronic Field Notes Pilot Project to reduce the amount of duplicative data entry occurring. The Project’s goal was to evaluate the possibility of SOS collecting teams entering their collection data into their own copy of BG-BASE and then electronically transferring the data to the SOS National Coordinating Office for evaluation and incorporation into the national database.
The project began with an evaluation of collection data being captured by SOS collecting teams. From this evaluation BG-BASE, Inc. developed specialized SOS Collectors’ Software, which allows SOS collecting teams to capture all associated collection data electronically and e-mail it to the SOS National Coordinating Office in Washington, DC.

In early 2007, customized field laptops were loaded with the specialized SOS Collectors’ Software developed by BG-BASE, Inc. and a training class was held at Desert Botanical Garden. Seven SOS collecting team leaders from across the country learned how to enter collection information into their laptops and export data for transfer to the SOS National Coordinating Office. One of the SOS collecting teams that participated in the pilot training course was the BLM’s Colorado State Office in Denver, Colorado.

The BLM Colorado State Office has coordinated over five hundred wildland native seed collections from very diverse habitats, ranging from sub-alpine forests and sand dunes to shale cliffs. A large amount of data including location, associated species, population size, number of plants sampled, and taxonomic details is recorded for each collection and is then integrated into the SOS National Database. The SOS Collectors’ BG-BASE technology has greatly reduced the amount of duplicative data entry.

The field laptops give collecting teams flexibility to enter this collection information and carry a comprehensive inventory of past collection records with them in the field. Current research suggests that to develop genetically diverse native plant materials from wildland native seed collections, at least twenty populations from across the range of a species need to be sampled. Having previous collections’ data helps teams target the needed number of collections.

The SOS-coordinated multiple population sampling approach has been put to use in the collection of over 3,200 taxa, including Sandberg’s bluegrass (Poa secunda), which has been a focus of Colorado’s collecting efforts on the Uncompahgre Plateau in western Colorado. As part of NPMDP, a partnership formed between BLM and the Uncompahgre Plateau Project, which resulted in an estimated nine thousand pounds of Sandberg’s bluegrass seed that will be available for purchase in late 2009. The source seed for this project was collected on the Uncompahgre Plateau by the SOS collecting team and will supply agencies with genetically appropriate seed for use in restoration.

As the 2009 collecting season comes to a close, SOS is gearing up for even more activity in 2010. Next up: ten thousand collections and a new mapping system!

For more information about Seeds of Success contact:
Mary Byrne is the SOS National Collection Curator, and can be reached at Mary_Byrne@blm.gov or 202-912-7233.
Peter Gordon is a botanist for Colorado BLM and can be reached at Peter_Gordon@blm.gov or 303-239-3715.

Need for Seed

In Colorado the need for native plant materials was highlighted by the results of a survey run by the Uncompahgre Plateau Project: 75 percent of those surveyed cited availability as the main limiting factor to purchasing native seed for landscape restoration projects.
Are your garden’s guests and students asking for access to your instructors’ slides or PowerPoint presentations, course reserve readings, videos, journals or indexes, assessment/study tools, and more? Longwood Gardens surveyed its guests and students to answer some of these questions. The Zoomerang-delivered survey posed statements about online learning to which respondents rated their agreement via a Likert scale. See Figure 1 showing how important electronic access is to our respondents.

How can you ensure that your garden’s and instructors’ intellectual property is protected and only students enrolled in courses or only guests paying for lectures/seminars have access to your course content? Learning Management Systems (LMSs), a.k.a. Course Management Systems (CMSs), are robust software that manage access to course content. There are many LMS vendors, and WCET EduTools (http://www.edutools.info/) provides a tool for comparing the relative strengths and weaknesses of each. However, we recommend a custom-developed rubric specific to your garden’s needs.

Online learning can be accomplished as either hybrid learning (a.k.a. blended learning) or immersive learning (a.k.a. fully online learning). Hybrid courses supplement classroom instruction, whereas immersive courses replace classroom instruction with wholly online teaching and learning. See Figure 2 for the results of our survey about online classes.

Online courses promote student-centered learning, and hybrid courses are ideal for maximizing in-person instruction. Introductory materials and reading materials can be posted online, thus freeing the instructor to use valuable classroom time for discussion. Instructors can post supplemental and review material for students to study and assign group projects, which can include online collaboration and discussion; assignments can then be submitted online for grading. Hybrid courses can include student self-assessments, quizzes and exams, and students can monitor their own progress and grades throughout the course.

Immersive courses expand learning opportunities worldwide. People who want to learn about gardening and horticulture, for example, can participate from anywhere as long as they have a
computer with Internet access. This type of course requires creativity to ensure that the learning experience is applicable regardless of geography.

Whether developing a hybrid or immersive course, instructors need to re-purpose their content for online delivery. For example, a presentation shown in class should be modified for viewing and printing online, and digital images should be optimized for displaying on screen to reduce file size and download time. Importantly, interface and content must be organized in a way that students and instructors can easily navigate and process the information. Longwood Gardens employs an instructional designer to administer its LMS and guide instructors in the transition from traditional classroom instruction to online learning. The instructional designer plays a critical role in deployment of the LMS by managing online courses and users, training faculty and students in use of the LMS, providing pedagogical and technical support for instructors, and promoting best practices for online learning.

Longwood Gardens launched LongwoodLIVE (http://longwoodlive.org) in summer 2009 as its hosted system provided by Desire2Learn, Inc. (http://www.desire2learn.com/) via the vendor’s Learning Environment LMS. We offer our Professional Gardener courses and select Continuing Education courses as hybrid learning. The Professional Gardener online courses include PowerPoint presentations and handouts, discussion forums, assignment dropboxes, quizzes, exams, grade book, glossary, videos, and more. Less formal Continuing Education courses focus on improving the guest experience through strategic selection and use of the components that improve accessibility to resources and encourage social interaction among the guests enrolled in the course. Both students and instructors are praising the accessibility and flexibility that online learning has brought to Longwood Gardens’ courses, and we look forward to engaging new audiences through additional hybrid and immersive courses in 2010.

Dr. Doug Needham is head of the Education Department at Longwood Gardens in Kennett Square, Pennsylvania. He can be contacted at dneedham@longwoodgardens.org. Susan Caldwell is the instructional designer at Longwood Gardens. To contact Susan, e-mail her at scaldwell@longwoodgardens.org.
The Cycad Collection of Montgomery Botanical Center

MICHAEL CALONJE, CHAD HUSBY, AND PATRICK GRIFFITH

Introduction

Montgomery Botanical Center (MBC) in Coral Gables, Florida, stewards a botanical treasure — the largest cycad collection in the Western Hemisphere. This collection is the fulfillment of Colonel Robert H. Montgomery’s dream of growing a wide diversity of cycads and palms at his estate. MBC now has two thirds of extant species, with 3,191 plants on the grounds, and about twice that many in the nursery. Ongoing fieldwork is steadily increasing these numbers and contributing new discoveries.

Cycads

Cycads are exceptional among living plants, surviving for nearly 300 million years since the Paleozoic. The world’s oldest seed plants, predating the dinosaurs, they peaked in abundance and diversity in the Mesozoic. Although cycads have cones, they are not closely related to conifers and ginkgoes. Whereas today only one Ginkgo species remains, there are around three hundred known cycad species, with more being described. Cycads mostly have restricted ranges today. Although cycads have persisted, slow growth rates and long reproductive cycles limit their ability to regenerate. Thus, cycads are in great need
of conservation efforts to survive human impacts (Donaldson et al., 2003).

In terms of antiquity and uniqueness, cycads have been likened to the Rosetta Stone, demonstrating “connections between the early origins of seed plants and their present-day counterparts (Norstog, 2003).” Cycads share many primitive features with Ginkgo, ferns, and lycopsids, in aspects of gametes, branching, anatomy, vernation, and symbioses, so they are of great interest for science, conservation, and appreciation. For these reasons, MBC continues its tradition of developing the cycad collection as a world resource.

**History**

Cycads at MBC date to the founding of the Coconut Grove Palmetum (CGP) in 1932 by Colonel Montgomery. That year began an intense procurement effort focused on large specimens. One 1932 collection that remains of great importance is Microcycas calocoma (Figure 1). This plant, brought from Cuba in 1915, was purchased in October 1932 from industrialist James Deering’s nearby estate, Villa Vizcaya. Through decades of care and propagation, this individual plant is either the father or grandfather of many Microcycas in cultivation (Calonje, 2007). July 1936 saw the addition of Macrozamia moorei, Dioon spinulosum, Cycas media, Encephalartos altsteinii, E. lehmanii, and E. longifolius, and also more Microcycas. Mr. Adolph Jordahn, the Colonel’s superintendent, reported that planting the *Macrozamia moorei* required three men, and estimated that it was fifteen hundred years old.

When the land and collection transferred to the Montgomery Foundation in 1959, thirty cycad species were represented. The majority of accessions date from 1990 forward, a period of high investment in collections development. During this period, MBC found that their collections philosophy and goals were very much aligned with those of the North American Plant Collections Consortium (NAPCC). The MBC Cycad Collection was reviewed and recognized by the NAPCC in December 2007.

**Scope**

Montgomery cycad collections represent a majority of the world’s diversity (Table 1); MBC holds 214 species and 39 subspecific taxa. Currently, 303 species of cycad are recognized (Hill et al., 2007), but MBC’s work has discovered additional species (Calonje, 2009; Calonje et al., 2009). Breadth of species provides a quick diversity measure, but given the tentative nature of cycad systematics, a population-based approach provides greater depth of utility. One example is in the case of Panamanian plants which were long considered to be *Z. fairchildiana* until they were described as *Z. elegantissima*. Exact provenance ensures long-term utility for research and increases the conservation value.

Geographic scope includes all the world regions where cycads live, but with concentration in New World cycads, especially Central America and the Caribbean Basin (Figure 2). Practical considerations influenced past and current collections strategies; stated simply, South Florida provides excellent habitat for Caribbean collections, and MBC collecting logistics in the New World produce more outcomes for less investment. However, when opportunities warrant travel elsewhere, MBC commits the needed resources. This has resulted in MBC having the largest collection of *Cycas* (an Old World genus) in the Western Hemisphere. Conservation efforts detailed below provide an important example.

**Conservation**

*Cycas micronesica* is critically endangered and limited to several Pacific islands. Introduction of an exotic insect (*Aulacaspis yasumatsui*) in 2003 greatly reduced native populations. On Guam, less than 20 percent of the original population survives, and seedling recruitment is near zero, despite efforts to control the insect. This provides a straightforward example of how *ex situ* botanic garden collections are crucial for conservation efforts.

Montgomery collected *C. micronesica* in 1997 and 1998. Although these collections were important, they were of

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<th>MBC CYCAD COLLECTIONS</th>
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<td>Species in MBC collections</td>
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<td>Wild collected species</td>
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narrow provenance. In response to the increasing threat, MBC obtained further collections from Guam (and nearby Rota Island) in 2007, with support from the Association of Zoological Horticulture and the University of Guam. Collaboration between MBC, University of Guam, and The New York Botanical Garden (Cibrian et al., 2008) focused on broad population assessment and collecting. The resulting collection has maximum geographic breadth and genetic diversity and represents the largest single-species cycad planting in our living collection.

Reproductive success is already occurring in the 1997 and 1998 collections. Since 2007, 282 seeds have been distributed through ongoing hand-pollination efforts. Growing these living treasures widely helps ensure against extinction.

**Seeds**

Cycads were long assumed to be wind-pollinated, like other ancient plants. Researchers recently discovered that insects are primary pollinators. Outside native ranges, cycads must be hand pollinated, unless their pollinator is present. Montgomery produces seeds of known parentage for all genera except Zamia, which are pollinated by weevils (Rhopalotria spp.), and the native Zamia floridana which are pollinated by a clavicorn beetle (Pharaxonotha zamiae).

Individual cycads produce either pollen or seed cones, but never both. Hand pollination requires seed cones to be receptive. Pollen cones and seed cones are often not mature at the same time, so pollen must be stored at freezing temperatures. Pollen stored in the MBC pollen bank is exchanged with other botanical institutions and distributed to researchers.

**Treasures**

As true living fossils, cycads attract intense research interest, require effective conservation, inspire devoted appreciation, and deserve special consideration. For all of these good reasons, Montgomery is committed to this collection of unique plants.

**References**


The extent to which collections are documented is a very good measure of how "botanic" a botanic garden really is. 2010 marks the twenty-fifth anniversary of BG-BASE, software designed specifically for the documentation of biological (primarily botanical) collections. On the fifteenth anniversary of BG-BASE, we also wrote an article for Public Garden. In reviewing that article it struck us that much of what was true back then regarding plant records is still very true today. Working with a wide range of institutions around the world over the last quarter century, we have found many more things that link our documentation needs and practices than things that separate them, despite the many disparate computer systems in use and despite the many different types of institutions using them.

Why plant records?

Documentation of botanic garden collections is critically important for a variety of reasons:

- Living collections (unlike collections found in art and natural history museums) are dynamic; although the change may seem slow, it is relentless, and those changes need to be documented as they occur before they are lost for all time;
- Public gardens attract an enormous and diverse visitorship, with a wide range of expectations and information needs; utilizing your plant records system in conjunction with your education and outreach activities can help fulfill the obligations your institution has towards these visitors;
- Many plants grown today will not be available in the future, either because of species extinction or because changes in horticultural taste mean that most cultivars have a shelf life that is far shorter than often imagined; if
we do not keep – and pass along – good records, those who follow us will be none the wiser about our activities and collections today.

However, despite these compelling arguments, we frequently hear statements concerning cost and time that undervalue or undermine the importance of an institution’s plant records.

**Successful vs. unsuccessful plant records**

Institutions with the most successful plant records systems are those in which documentation is considered an institutional (not merely departmental or personal) priority. Good record keeping requires an unwavering commitment by the institution, as well as an understanding by the staff of the central importance of this activity. Finding this balance might mean restructuring some staff, educating the director and/or the board, dealing with departmental walls and rivalries, and encouraging staff to share their knowledge and responsibilities, all of which not only helps documentation *per se* but also helps build a strong and healthy institution. In other words, plant records are not something that are done for themselves but because the institution as a whole needs—and benefits from—them.

The best way to not succeed? Give an individual the responsibility for maintaining information about the collections (either manually or electronically) but not give that individual adequate time, resources, or encouragement. If you really want to fail, make sure that person thinks he/she only has time to ‘do’ plant records when the weather is bad, or that other staff have no accountability to report changes in the collection, particularly when material is newly acquired, is moved to a new location, or has died. We would not find it acceptable for the person running payroll to do the job when there is time, so why do so many institutions accept this for plant records?

Another common inefficiency is to use a series of different systems to track information that is inherently linked – we frequently see institutions using one database for their living collections, another for their herbarium, a third for their images, etc. Our approach has been to integrate all of these into a single application, thereby reducing development, training, and support costs while maximizing the sharing of information across the institution. [Please refer to www.bg-base.com for further information about how this integration has been accomplished.]

**Twenty-Five Years of BG-BASE in the Botanic Garden Community**

As of August 2009 BG-BASE has been installed in 188 institutions in 30 countries. Even though the two authors of this paper are the ones actually programming BG-BASE, it has been developed by means of creative input from literally hundreds of users around the world. This community approach has meant that the system remains focused on meeting real-world requirements; it also means that the way in which the system works and in which it encourages its users to work represent a form of ‘best practice’ in our community.

From the outset the system was conceived as a tool for managing both large and small collections in multi-user and stand-alone computer environments. We purposely design the system with the high-end site in mind, making the maximum capabilities available to all institutions regardless of whether they are able to use all of these functions immediately. As a matter of course,
us share data outside the BG-BASE community with organizations such as The Nature Conservancy, the U.S. Department of Agriculture, the Secretariat of the Convention on international Trade of Endangered Species of Flora and Fauna (CITES), the US Bureau of Land Management, PlantCollections, Botanic Gardens Conservation International (BGCI) and the Global Biodiversity Information Facility (GBIF), among others.

Future directions

BG-BASE will never be “done.” Hardware and software continually change, and new versions of BG-BASE are released approximately every other year, while a few institutions receive smaller updates on an as-needed basis in the interim. With every institution we visit or at every conference we attend, we invariably bring back new ideas for potential inclusion in the software. Despite the enormous breadth of the existing system, there are still a great many things we wish to add to support the BG-BASE community.

Increased functionality in managing images (arguably the greatest documentation crisis facing most of us) as well as the desire by some institutions to link to ESRI GIS software are two examples of user requests that now form new components for the next upgrade. Not far behind is work already underway on a new online documentation system, new reporting tools, tree hazard assessments, tracking IPM activities, and a re-thinking of our multi-site search web site, http://rbg-web2.rbge.org.uk/multisite/multisite3.php.

As we undertake new projects and ongoing challenges, we would both like to take this opportunity to express our gratitude to the entire botanic garden community for the many suggestions and thought-provoking discussions over the years, which have helped enhance what by today’s standards was a relatively small system in 1985. We look forward to ongoing and continued collaboration in the future.

References:


www.bg-base.com

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Summary of the living collection at Royal Botanic Garden Edinburgh as generated from BG-BASE.

Tables associated with the NAMES table in BG-BASE.
It’s easy for us plant enthusiasts to be seduced by the idea of verdant rooftops. Aesthetically, living roofs are a major improvement over typical asphalt or tar roofs, which are about as hospitable to humans and most other life forms as Death Valley on a mid-summer day. But before falling head over heels for green roofs, it’s worth asking whether they really, as touted, help insulate buildings and thus save energy that would otherwise be consumed for heating or cooling, counteract the urban heat island effect, remove particulates from polluted air, detain and cleanse storm water, and more.

Green roofs certainly seemed too good to be true to Steve Windhager, director of landscape restoration at the Lady Bird Johnson Wildflower Center, and his colleagues, so they compared the performance of six extensive green roof systems from six different manufacturers to each other as well as to traditional non-reflective blacktop and somewhat cooler reflective white roofs. The study was conducted on hot-tub-sized mini roofs, each thirty square feet. Each of the test green roofs was planted with the same eighteen native plants chosen for their wide tolerance of both drought periods and saturation after rainstorms, and the plants were provided with the same amount of irrigation when necessary.

Steve and his colleagues were surprised to find that there was a wide variation in performance among the different green roofs. They were much better at preventing the temperature of the air below from spiking on warm days, compared to both the conventional and reflective roofs. But while some of the roofs were able to capture a lot of storm water, others weren’t significantly better in this respect than the white or blacktop roofs. And while some of the roofs had nearly no adverse effect on water quality, others were worse than the typical suburban lawn—the more fertilizer in the planting medium, the worse the water quality, although after the first growing season, water quality dramatically improved. In short, no one system excelled at providing all the benefits conventional wisdom says green roofs are supposed to provide.

The Wildflower Center’s research is important in part because, although a host of studies have been done on green roofs in temperate environments, Austin’s climate is significantly drier, hotter, and
more prone to flash flooding than other study locations. To what extent does the Center’s research apply to other regions and climates? “I think that the storm water retention numbers will be pretty uniform no matter where you go,” says Steve. He adds that the study of green roof performance in Austin’s subtropical climate is useful “particularly if we are seeing a warming trend in our more temperate climates.”

When asked what advice he can give other public gardens considering green roofs, based on the Wildflower Center’s research, Steve pointed out that it’s important to determine why you want a green roof, then make sure that a green roof is the most efficient way to achieve your goals. Once you have decided that you’re going to pursue a living roof, make sure the manufacturer you’re working with is aware of your goals. “Green roofs can certainly be designed to capture storm water, have clean runoff, provide energy savings, and provide valuable additional gardening space,” Steve says, “but these expectations need to be made explicit at the outset of the project, or it will have an unfortunately high chance of not achieving all of these goals.”

After sixteen and a half years at Brooklyn Botanic Garden, Janet Marinelli started her own planning, interpretation, and publishing company, Blue Crocus Consulting. She has written several books and numerous articles on sustainable buildings and landscapes; you can find many of them on her website, www.janetmarinelli.com. Send any questions you would like answered to Janet at jmarinelli@earthlink.net.