

arboretum.arizona.edu

SPRING 2012

Volume 8, Issue 1

CAMPUS ARBORETUM ADVISORY BOARD

Bob Baker (UA '68)
Caryl Clement (UA '79 and '00)
Sarah Davis (UA '80 and '95)
Chris Monrad
Alan Myklebust (UA '77)
Irene Ogata (UA '76 and '86)
Bob Preble (UA '54)
Judith Ratliff (UA '91)
Patsy Waterfall (UA '82)
Lori Woods (UA '79)

DIRECTOR

Dr. Tanya Quist

INSIDE THIS ISSUE

- Inspired by Nature.....2
- Helping Us Grow.....3
- From the Collection.....4
- Landscaping Tips6
- The Sage Arborist7



For the Love of Trees

By Dr. Tanya M. Quist

I love trees. In fact, I've been known to confess that "I love trees more than most people" (veiling, to some, the truth; that I love trees more than I love people some days!) However, while those close to me might think therapy is in order to remedy my obsession, I believe there is great wisdom in my affinity. Trees are among the largest organisms on the planet. In nature, they enjoy incredible longevity. They are models of sustainable growth, efficiency, resilience, adaptation, cooperation, and generosity. Trees are fundamental to all life on earth as they are essential to both our environmental and human health and well-being. (What's not to love, I ask?) As Henry David Thoreau expressed, however, "The greater part of the phenomena of Nature...are concealed from us all our lives. There is just as much beauty visible to us in the landscape as we are prepared to appreciate, and not a grain more...A man sees only what concerns him." So it seems, with trees, what is unknown to many is vital to our survival. Trees provide goods and service that support and enhance human life and these contributions can be measured and quantified so as to provide a means to communicate with other tree-obsessed people as well as "normal" people (who spend less time looking into canopies, above eye level).

Students working for the Campus Arboretum have been collecting data for each of the 7810 trees on campus this Spring. They are

using the i-Tree software, developed by the USFS, to calculate the economic and ecological contributions of these trees. Their work will guide future tree selection, help us plan for succession, understand the composition and distribution of tree species, assess biodiversity and gauge our progress toward sustainable landscape management. We aim to promote greater landscape sustainability, which means, we strive to maximize the benefits trees provide while minimizing the inputs of labor and resources required. Throughout this edition, you will notice the appearance of a new motif. This motif is an arboreal interpretation of the leafy logo used for UA Sustainability and communicates our desire to emphasize responsible landscape stewardship and development. Experimentation has always been a hallmark of this wonderful University. However, the great value in the experimentation came as a result of meticulous scrutiny of the existing data that allowed so many to successfully select, locate and nurture trees from every continent on earth on the U of A's campus. Experimentation must build on the wealth of previous data regarding adaptation. To grow sustainably, collections development must pivot on informed and responsible plant selection coupled with properly timed and appropriate landscape management practices for each species. I hope you'll visit and see that, with help from our friends, we are replacing the hundreds of trees damaged and lost last winter with promising native and arid-adapted selections. We look forward to sharing our success with educators, researchers and Campus Arboretum visitors who share our vision and see the fundamental importance of this living laboratory.



"The real voyage of discovery consists not of seeking new landscapes but in having new eyes."

– Marcel Proust



INSPIRED BY NATURE

The Campus Arboretum at the University of Arizona is currently in the process of making our wealth of resources and research more accessible to fellow scientists as well as members of the community. Over the coming months a new website will be launched with access to detailed plant taxonomy and a botanical image database for over 400 species of plants from the Campus Arboretum collection. Dan Stein, a student in the Plant Sciences department, is currently documenting the many species of plants all over campus for the project. The images included here are a small sample of Dan's personal work documenting trees and landscapes in various climates.

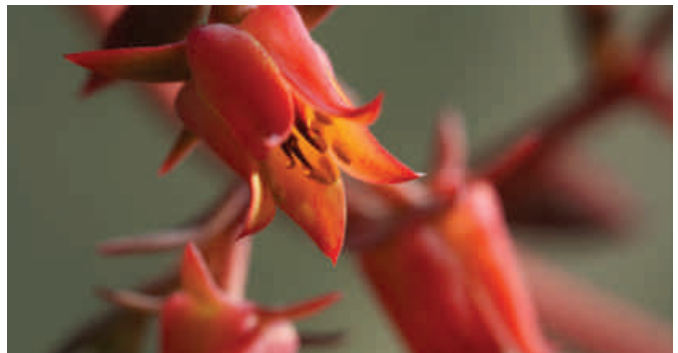
Dan became passionate about photography while growing up in the New York City area. On receiving a BFA in Photography + Imaging from New York University's Tisch School of the Arts, he took several years to create a



Thinking is more interesting than knowing, but not so interesting as looking.

– Johann Wolfgang Von Goethe

photo catalog of his travels around the globe, from Costa Rica to Chile and Australia. After returning to work in NYC studios for several years, Dan traded city life for the natural beauty of the American Southwest. Dan is currently double majoring in Plant Sciences and Agricultural+Biosystems Engineering here at the University of Arizona.





HELPING US GROW

Dr. Philip N. Knorr



Philip N. Knorr and Amy Jean Knorr, April 22, 2006. Olive Walk Benches Dedication.

Philip N. Knorr earned his Bachelor of Science degree with Honors from the University of California at Berkeley in 1938, a Master of Forestry from Duke University in 1940 and a Ph.D. in Forest Management from the University of Minnesota in 1963. He worked at the University of Minnesota and Oregon State University before joining the faculty at the University of Arizona in 1959 with the Department of Watershed Management and later, in the School of Renewable Natural Resources. While at the UA, he researched pine forest management practices, forest product

marketing and forest tree selection for arid lands. His proficiency and solid mentorship of students was manifest in his significant teaching responsibilities. He taught photogrammetry, forest management, forest economics, forest watershed field studies and forest and wild land policy. His involvement in many key initiatives in the Department of Watershed Management and the School of Renewable Natural Resources helped establish the reputation of the School within the University of Arizona and throughout the nation. He served as chairman of the Forest-Watershed Management Program and was a fellow of the American Association for



"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."

– Margaret Mead

the Advancement of Science. In addition to many other professional organizations, Dr. Knorr was a member of the Society of American Foresters for more than 70 years. His lifelong passion for trees is also reflected in his support for the Campus Arboretum. With great foresight, Philip and his wife, Amy Jean, were among the first and most dedicated supporters of the Campus Arboretum. They sponsored benches on the Olive Walk, established and generously supported an endowment in Philip's name, attended events and celebrations and provided encouragement and advice. In honor of his sustained commitment to research and teaching in the School of Renewable Natural Resources and for his support for the Campus Arboretum, Dr. Knorr was awarded a Lifetime Achievement Award from CALS in 2007. Words cannot express sufficient gratitude, admiration and respect for Dr. Knorr. He will be missed by many, though, the spirit of all he created lives on.



"A diverse ecosystem will also be resilient... the more complex the network is, the more complex its pattern of interconnections, the more resilient it will be."

– Fritjof Capra

RECENT TRENDS IN BIODIVERSITY/ GROWTH

- Total trees in the collection after 2010:7972
- Total trees in the collection after 2011:7810
 - Net loss:..162 trees.
- Total number of unique taxa in 2011:434
- Total number of unique taxa in 2012:422
 - Reduced biodiversity:..12 taxa.

Support the Campus Arboretum and help us rebuild



FROM THE COLLECTIONS

A New Native Golden Spined Barrel Cactus Finds a Home in the UA Campus Collections; *Ferocactus wislizeni* f. *flava*, golden fishhook barrel

By Chris Monrad, Monrad Engineering



Chris Monrad, a member of the UA Arboretum Advisory Board, has been a Tucson Cactus and Succulent Society (TCSS) member for nearly 20 years and was a co-founder of the TCSS Cactus Rescue program in 1999. During the numerous cactus rescues that he assisted with, he began noticing and marveling at the wide variety of spination patterns (black, brown, maroon, short, long, skinny, fat, nearly straight, highly recurved, etc.) present in our local barrel cactus, *Ferocactus wislizeni*. This fascination led to a special interest in and collection of plants in the genera *Ferocactus* and *Echinocactus*. His collection of these plants now includes several plants of nearly every species in each genus, for which, he is dedicated to pollinating and collecting seed.

During a 2001 cactus rescue project at Saddlebrooke near Catalina, AZ, Chris noticed a barrel cactus specimen with bright and pure yellow flowers as well as spines with a strong golden yellow cast. This plant was the first of only five such specimens collected by Chris over the next five years of rescue projects, with sites ranging from Saddlebrooke Ranch north of Oracle Junction to a new school site in Corona de Tucson, over 45 miles away from Saddlebrooke. Chris estimates this yellow spined / yellow flowered form occurs in perhaps one in every 5,000 or 10,000 barrel cacti, based upon his numerous plant surveys and rescue activities. The selection is known to be extremely frost hardy and fast growing with far showier buds, flowers and fruit than the non-native 'Golden Barrel' (*Echinocactus grusonii*).



"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it does otherwise."

- Aldo Leopold, from A Sand County Almanac

It is hoped that the TCSS Golden Fishhook will become the golden-spined barrel cactus of choice in Tucson landscapes.

Soon after acquiring the first two specimens, Chris wondered about the possibility of performing selective pollination between those two plants to develop a purpose-bred *Ferocactus* cultivar and began to consult with other noted *Ferocacti* propagators in the area. Some of the results from the first propagation efforts have been encouraging and many new plants are emerging from these crosses. Of those propagated, approximately 200 of the original golden fishhook barrel grown to landscape sized specimens and held as stock for use by the local landscape design community for upcoming landscape projects of significance. With Chris' suggestion, the new *US Green Building Council LEED Platinum Certified* Likins Hall student housing complex at Sixth Street and Highland was designated by Caryl Clement of Wheat Scharf Associates to receive over 100 of these plants in two gallon sizes as part of a pedagogical landscape display. A smaller cadre of these cacti was also located at the *US Green Building Council LEED Platinum Certified* Arbol del Vida residence hall complex at Sixth Street and Tyndall. Many of these plants flowered in the summer of 2011, just as the housing projects were being occupied and provided an excellent show of vivid yellow buds, leading into yellow blossoms and ultimately, the familiar yellow fruit of our notorious *Ferocactus wislizenii*. These specimens are now proudly contained within the collection of the UA Arboretum and will provide many years of beauty, student research opportunities and visual interest along the Sixth Street frontage. Other locations at which these specimens can be viewed include the Pima County Superior Court and Pima County Courthouse landscapes, the Jewish Community Center Sculpture Garden, Colonel Smith Middle School in Fort Huachuca and the new Pima Prickly Park.



FROM THE COLLECTIONS

Native Mesoriparian Tree Plantings at Arbol de la Vida and Likins Residence Halls

By Caryl Clement, Landscape Designer with Wheat Scharf Associates

Two of the UA's newest residence halls, Arbol de la Vida and Likins Hall are getting some international attention as the first residence halls in the state to earn a *US Green Building Council LEED Platinum* certification. The recently constructed campus residence halls, aim to promote sustainability of both the student community and of the surrounding environment. The outdoor areas were designed to blend the indoor and outdoor functions, create 'green gateways', sustainable sites and landscape systems, and use native Sonoran Desert plant species.

Native Trees

Of particular interest for the Campus Arboretum, was the inclusion of native mesoriparian trees into the planting palette. The unique building arrangements, designed by NAC Architecture, create enclosed, shaded, canyon-like courtyards and extensive water harvesting opportunities. The design team recognized these features as appropriate microclimates for the mesoriparian tree species; Arizona Sycamore (*Platanus wrightii*), Arizona Ash (*Fraxinus velutina*) and Arizona Walnut (*Juglans major*)

Soils, Irrigation and Water Harvesting

The planting soils were analyzed and amended according to recommendations provided specifically for the mesoriparian trees. In areas where the trees were surrounded by pavement, Structural Soil™ (with amendments) was incorporated around the perimeter of the planter opening, varying in width and 5 feet deep. In order to improve water delivery and reduce water consumption, Irrigation Consultant Carl Kominsky specified separate valves for the mesoriparian trees and Deep Drip stakes to be used in combination with drip emitters. Soil moisture sensors were located throughout the planting areas at depths of 8" and 24" providing soil moisture information to the irrigation controller to prevent both under and over-watering. In support of sustainable practices, numerous passive water harvesting techniques—for both on and off site stormwater and A/C condensate sources were implemented. Traditional water harvesting practices such as micro-basins, swales, check-dams, and recessed grading were employed. A final innovation required, given the deep rooting characteristic of mesoriparian species, was to distribute harvested stormwater to sub-surface soil depths. The perforated pipe system collects stormwater and distributes water throughout the site to a soil depth of 3+ feet by way of a Deep Water Distribution System devised by Stantec Civil Engineers.



Native trees find a suitable home in the residence halls.



Water harvested from surface runoff pours into basins to support establishment of deep rooted, native trees.



"Humans need continuous and spontaneous affiliations with the biological world, and meaningful access to natural settings is as vital to the urban dweller as to any other."

- Dr. Stephen Kellert, Yale University



LANDSCAPING TIPS

The Most Important Warm Weather Landscape Maintenance Tip You Will Ever Get!

By Judith Ratliff, MLA, landscape designer.

When it's hot, plants need water. Some more. Some less, it's true. But plants need water. It follows that the most crucial maintenance to perform toward the beginning of every warm season, or whenever plants seem to be dry or failing to thrive, is to make sure your irrigation system is working properly. (I do this myself at least quarterly.)

Most people don't realize how prone to malfunction our drip irrigation systems are. But many things can go wrong with them – and generally do. They are made of inexpensive plastic parts, after all. That's what makes them affordable to install and explains why they have become the standard of the landscape industry. But poly lines become brittle and split; emitters get clogged with calcium, small rock or soil; diaphragms (the working part of the valves) harden up and fail to stop the flow of water when the water is turned off. Be aware that checking irrigation function is not always a routine task with landscape maintenance crews. You may need to specify what is expected.

If you're the independent type, you might take matters into your own hands and learn to operate and maintain your own irrigation systems. You can change the amount and frequency of watering as the seasons change. Start by looking at your irrigation timer/clock, find out what brand it is and see if you can download an operation manual online. If this fails, contact a local irrigation parts supplier and see if they can get you an operation manual. Or get a lesson from your maintenance worker, the original designer of the landscape or the landscape contractor who installed the system. You want to be in control of your irrigation system, you don't want it controlling you!

In the Spring, perform a routine check of your system: one by one, turn on each line of your irrigation system. Each is designated for a specific group of plants. Typically one might find a tree line, a shrub line, a groundcover line and a succulent line, each requiring different watering frequency and volume. As each line comes on, walk around your property and identify where wet spots appear. You will be able to trace the lines and identify plants are not getting water and thus, locate the spot needing repair. If this sounds tedious to you, hire someone to do it for you.

My strategy is to take regular walks in my garden. I note, up close, how each plant is doing. I observe the hummingbirds that are out there with me doing their thing. I keep an eye out for animal or insect damage that needs attention and notice any dead wood or yellowed leaves that could be removed or treated with chelated iron to improve the appearance of my plants.

Other irrigation issues to look for include, areas of water bubbling up from underground in a way that looks like a little spring. This is undoubtedly a split poly line. Large wet spots at the end of spaghetti lines where it's obviously been continuously wet for a while are probably caused by a valve that is stuck on. Lastly, irrigation lines in the desert, unprotected by landscape walls, are constant enticements for local wildlife. Check to make animals are not digging up your irrigation lines and breaking them or tugging off emitters. Leaks outside walls (and sometimes inside walls) that are not noticed for months are the source of those \$500 water bills you have heard people complaining about at parties.

NEW PLANTS GROWING AT DELEP

Propagation of new sustainable tree selections-

The Desert Legume Program (DELEP), the research arm of the Boyce Thompson Arboretum has begun growing seed for a variety of new Campus Arboretum introductions. These plant selections were vetted by our collections committee and conform to the standards defined by The Campus Arboretum Collections Policy for drought and heat stress. They were also specially chosen for their resistance to freeze injury. These plants fared well in trials at the DELEP test plots near the Rillito river; one of the coldest spots in Tucson. DELEP's fields also subject the plants grown there to poor soil and periodic flooding. We are excited to have identified plants that are nearly indestructible. Furthermore, they're beautiful! It will be a few years to achieve plants of sufficient size to plant on campus so stay tuned! In the meantime, here is a list of the future additions:

aromita	Acacia aroma	santa rita acacia	Acacia millefolia
chihuahuan white thorn	Acacia neovernicosa	retama	Bulnesia retama
giraffe thorn	Acacia erioloba	palo santo	Bulnesia sarmientoi
wright's catclaw	Acacia wrightii	smooth mesquite	Prosopis laevigata
silver leaf acacia	Acacia cana	leafless senna	Senna aphylla
black gidgee	Acacia pruinocarpa	Schott's stickpea	Zapoteca formosa ssp schottii
raspberry jam wattle	Acacia acuminata		



THE SAGE ARBORIST

A Few Hundred of My Favorite Trees – *Brahea armata*

By Dr. Tanya M. Quist

SPECIES DESCRIPTION-

Scientific name: *Brahea armata*

Family: Arecaceae

Synonym(s): *Brahea roezlii* Lind,
Erythera armata (S. Wats.) S. Wats.

Common Name(s): Mexican blue fan palm, blue hesper palm, sweet brahea and, in Spanish, palma azul, palma ceniz and palma blanca.

Range: Baja, California and Mexico. This species is the most widespread, endemic palm of the northern peninsula.

Associated plants: *Washingtonia filifera* or *Washingtonia robusta*

Collectors: 14 Jul 1963 Richard S. Felger & Dan Mulford,

Type specimen: Missouri Botanical Garden.

Native Habitat: Arid regions, like dry woodlands, on limestone soils.

CHARACTERISTICS-

Growth Habit: upright medium sized palm.

Growth rate: Slow growing.

Form: Single trunked fan palm.

Size: Up to 40' tall with fronds spreading to 12' wide.

Leaves: fan-shaped silvery-blue leaves grow 2-6' wide on 3' long petioles.

Petiole: Margins are armed with curved, dark thorns and a rough coat of wax at the base.

Seasonality: Evergreen. The stiff, waxy fronds persist and form a shag around the trunk.

Flowers: Multiple, branching, pendulous inflorescences extend beyond the crown and droop downward extending up to 15' long. The white, perfect, highly fragrant flowers bloom in Spring.

Fruit: 1/2" – 3/4" long, ovoid, reddish-brown drupes.

Stems/Trunks: 2' wide trunk flares slightly at the base and is smooth except for leaf scars.



CULTURAL REQUIREMENTS-

Light: Full sun to part shade. Tolerates reflected light and intense heat.

Water: Drought tolerant when established. Deep watering monthly during the summer months.

Soil: Prefers well-drained soils. Tolerates infertile soils of varied pH.

Propagation: Best sown from ripe, fresh seed at 24°C. Germination occurs after 3-4 months unless primed 24 hours in warm water. Grow the seedlings on in the greenhouse for at least their first three winters and plant outside after the risk of frost has passed.

Maintenance: Remove dead fronds and fertilize in the Spring.

Hardiness: Best for USDA Zone 9, but known to resist damage down to -10°C when mature.

Transplanting and Establishing: Tolerates transplanting and forms new roots readily when young. Plants should be staked and irrigated deeply until established.

NATURAL HISTORY-

Armata, the specific epithet in the latin binomial means "armed," and refers to petiole's dark thorns.

ETHNOBOTANY-

The leaves of this palm, as most palm species, can be used to make brooms and as thatch for roofing. The Cocopah, native people of Baja, California, ate the seeds after roasting them. Recent science reveals that the phenolic compounds extracted from *Brahea armata* have potential therapeutic benefit in treatment of prostate disease (Rittmaster 2008).

LANDSCAPE USE:

- An attractive, low maintenance and readily available nursery tree in the American southwest.
- Provides a tropical effect.
- Does well in lawns.
- Serves effectively as an accent, growing in groups and in containers (when young).
- Grows well as a street tree or in residential and commercial landscapes.
- Does best planted on a southern or western exposure.
- No known hazards or liabilities.

SOURCES:

McMillan-Browse. P. Palms for Cooler Climates.

<http://cals.arizona.edu/pima/gardening/aridplants>

<http://arboretum.arizona.edu/>

<http://eol.org/>

<http://swbiodiversity.org/seinet/>

<http://tropicos.org/>

Best Pract Res Clin Endocrinol Metab. 2008 Apr;22(2):389-402

*If you have a favorite tree you would like to have featured, contact me at infoarboretum@ag.arizona.edu.



College of Agriculture
and Life Sciences

Campus Arboretum is published semiannually by the College of Agriculture and Life Sciences at 1140 E. South Campus Drive, Tucson, AZ 85721-0036
Volume 8, Issue 1 April, 2012

NONPROFIT ORG
US POSTAGE PAID
TUCSON AZ
PERMIT NO.190

Campus Arboretum
P. O. Box 210036
Tucson, Arizona 85721-0036

The University of Arizona Campus Arboretum welcomes your support!

Become a member or donate to help provide needed resources for maintenance and preservation of existing tree collections, public educational and outreach activities and future expansion of collections and programs.

Donate online at: <http://arboretum.arizona.edu>

or

Send a check payable to UA Foundation/Campus Arboretum along with this form to:



Campus Arboretum
PO Box 210036
University of Arizona
Tucson, AZ 85721

Your contributions are tax deductible.

Please specify where you would like your contribution sent:

- This gift is for the Davison Friends of the Campus Arboretum Endowment.
- This gift is unrestricted and can be used for current projects.

Name: _____

Mailing address: _____

Phone: _____

Save the trees!

Subscribe to receive the electronic newsletter by emailing: infoarboretum@ag.arizona.edu