



NATIONAL WILDFLOWER RESEARCH CENTER

wildflower

September/October 1996

Volume 13, Number 5

SECRET FRIENDS OF THE CACTI

c Martin D. Tuttle
Bat Conservation International



Plants are masters at hiding their secrets, particularly desert plants that open their blossoms under the cover of night. These secrets include the close relationships they have with other desert animals – especially bats. Many people don't know that nectar from cactus blossoms is an important food source for certain bat species. Bats, in return, ensure pollination and seed dispersal for the cacti.

Cardon (*Cerus pringlei*), saguaro (*Carnegiea gigantea*), and organ pipe (*Lemaireocereus thurberi*) cacti are three North American species that rely on bats for pollination. Bats also frequent agave plants, which, while not cacti, include more than 130 species in North America and provide an alternate food source. The above species are all residents of the Sonoran Desert, which stretches from Mexico's Central Valley to southern Arizona

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Autumn Leaves

Wondering where and when the fall color will be best? The following states maintain fall foliage hotlines, highlighting the best drives and places to see Mother Nature at her finest.

ARKANSAS:
(800) NATURAL
ALABAMA:
(800) ALABAMA

CONNECTICUT:
(800) 282-6863
DELAWARE:
(800) 441-8846
IDAHO:
(800) VISITID
ILLINOIS:
(800) 223-0121
INDIANA:
(317) 232-4002
IOWA:
(515) 233-4110
KANSAS:
(913) 296-2009

KENTUCKY:
(800) 225-8747
MAINE:
(800) 533-9595
MASSACHUSETTS:
(800) 227-MASS
MINNESOTA:
(800) 657-3700
MISSOURI:
(800) 898-8895
MONTANA:
(800) VISITMT

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FALL FOLIAGE fun

With a little time and patience, you can bring the colors of fall into your home, office, or classroom. Here's how to create beautiful leaf prints on everything from T-shirts to trick-or-treat bags. You will need:

- Leaves of various shapes and sizes
- Acrylic paints for painting on paper
- Textile paints for painting on cloth
- Paint brushes (various sizes)
- Paper or cloth items to be printed
- Newspaper to cover work surface
- Paper towels

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Fall Seeding For Spring Wildflowers

It's planning time and will soon be planting time! Seed planting time, that is. Early fall is the best time for seeding wildflowers in most parts of North America.

Wildflowers usually bloom from spring through early fall and set seed soon after flowering. For many species, it is important that their seed be in the soil this time of year for one of two reasons: some species – especially spring annuals – germinate in the fall and establish root systems and a low rosette of leaves before becoming dormant for the winter. This gives them a running start on growing, flowering, and setting seed the follow-

ing spring as warm weather and spring rains chase away winter.

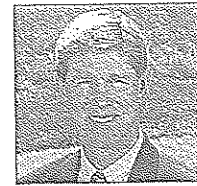
Other species need a period of winter cold to break seed germination barriers and allow for spring germination, growth, flowering, and seed set. Of course, many perennials do not flower until the second year (or even subsequent years), so have realistic expectations for spring flowering.

Which brings up the question of what to plant. We recommend selecting species native to your region that provide the color, height, and bloom season you desire. If you are trying to establish a wildflower meadow, don't forget to include regionally native

grasses, too.

If you are tempted to go the "add water and stir for instant success" route of a pre-packaged wildflower mix for your part of North America, compare the list of "wildflowers" in the mix with a list of plants native to and recommended for your region (such as the lists available through the Center's Clearinghouse). If you find non-native species listed, be aware

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David K. Northington, Ph.D., is Executive Director of the Wildflower Center

The National Wildflower Research Center is a nonprofit research and educational organization committed to the preservation and reestablishment of native wildflowers, grasses, shrubs, trees, and vines in planned landscapes.

Founder
Lady Bird Johnson

Executive Director
David K. Northington, Ph.D.

Editor
Joshua Blumenfeld

Designer
Elaine Brown

Copy Editors
Dyanne Cortez, Joseph Hammer,
F. M. Oxley

Contributing Authors
Hope Vanderberg

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NEWS! WILDFLOWER CENTER NEWS!

The radio public service announcements produced for the Center by Tocquigny Design of Austin won Best of Show in the 1996 regional Addy Awards given by the advertising industry. Other components of this radio and television campaign took gold, silver, and bronze awards.

If you're in the Austin area September 22, stop by the Wildflower Center to celebrate the Autumnal Equinox. September is Fall Planting Month, and there will be lectures, demonstrations, and special children's activities. Plus, the gallery, cafe, and gift store will remain open until 5:00 p.m.

Also September 22, meet authors Geyata Ajilvsgi (*Wildflowers of Texas*) and Brother Daniel Lynch (*Native and Naturalized Woody Plants of Austin and the Hill Country*) during their booksignings in *Wild Ideas: The Store*.

The Center hosts the American Association of Botanical Gardens and Arboreta Southeast / Southwest Regional Meeting September 27 - 29. The theme is "Beyond Collections: How to Plan, Interpret, Market, Fund, and Bring Your Garden to Life for Your Visitors." Garden professionals from Florida to California will journey to the Center for this event.

CNN anchor Judy Woodruff and White House correspondent Helen Thomas interviewed Mrs. Johnson at the Wildflower Center for a CNN special report: "The Presidents." Look for it to air in September.

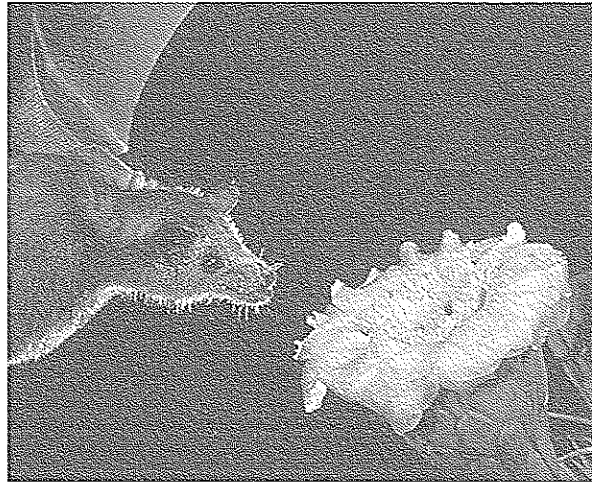
The Center has become *the* wedding spot in the Austin area, with more than 60 couples having their weddings and receptions in the Courtyard, Gallery, Auditorium, Library, or Oak Grove.

and extreme southeastern California. Three species of nectar-feeding bats call this desert home: the Mexican long-tongued bat (*Choeronycteris mexicana*), the greater long-nosed bat (*Leptonycteris nivalis*), and the lesser long-nosed bat (*Leptonycteris curasoae*).

The bat and cactus relationship is a textbook example of co-evolution. The cacti produce fragrant, highly visible, night-opening blossoms that are shaped to accommodate a bat's head – a unique arrangement designed to discourage other pollinators. The bats' elongated tongues and muzzles are perfectly suited for feeding on cacti such as the saguaro, organ pipe, and cardon. As bats gather nectar, their heads become covered in pollen, which is transferred to new flowers as they forage.

Different blooming times allow plants to "choose" their visitors. The organ pipe and cardon cacti open at dusk and close by mid-morning, making bats their primary pollinators. The saguaro, however, hedges its bets by making use of additional pollinators such as birds and bees. It can accommodate these pollinators by opening its blossoms well after sundown and remaining open through much of the next day. This flexibility helps the saguaro survive in its environment, which is less predictable than that of the organ pipe and the cardon.

Pollination is not the only way bats help cacti; they also promote new growth by spreading cactus seeds. In addition to eating the nectar of cacti, bats also eat the fruit and drop or pass the seeds as



*A lesser long-nosed bat approaches a saguaro flower (*Carnegiea gigantea*) in search of nectar.*
c Merlin D. Tuttle / Bat Conservation International

they fly. Also, during foraging, bats sometimes stop to rest in a shrub or tree. They often deposit seeds under these trees, called "nurse plants." Nurse plants provide a protective canopy that greatly increases the chances of young cactus plants surviving. Since bats may cover 40 km or more in one evening of feeding, this represents



a greater distribution than can be achieved by other seed dispersers. Just as the cacti rely on the bats, so do the bats rely on the cacti – it's a strategy for mutual survival. And there is reason to be concerned for

both. In some areas, cardon are not producing as much fruit as they could. The shortfall is apparently due to the displacement of many bats, chased out of their roosts by villagers along the bats' migration route who may mistake them for vampire bats. The agave, too, faces decline, though for a different reason: tequila. It is a favorite target of bootleggers who harvest the

plant to make the drink.

Many desert animals besides bats rely on cacti for much-needed food, moisture, and shelter in the harsh desert environment. The loss of these majestic plants would significantly impact all desert life, and it is essential we understand and protect the relationships (and secrets) that sustain these beautiful ecosystems.

Guest author Joan Ivy is Publications Editor for Bat Conservation International, a nonprofit organization dedicated to public education, conservation, and protection of threatened and endangered bats. For more information, contact: Bat Conservation International Box 162603, Austin, Texas 78716 (800) 538-BATS (2287)

*A cross-section of a cardon flower (*Cerus pringlei*) reveals the "lock and key" relationship between bats and the cacti on which they feed.*

c Merlin D. Tuttle / Bat Conservation International

Wildflower

NOTEBOOK

Night Pollinated Species

Botanical Name: *Lemaireocereus thurberi*
(= *Cereus thurberi*)

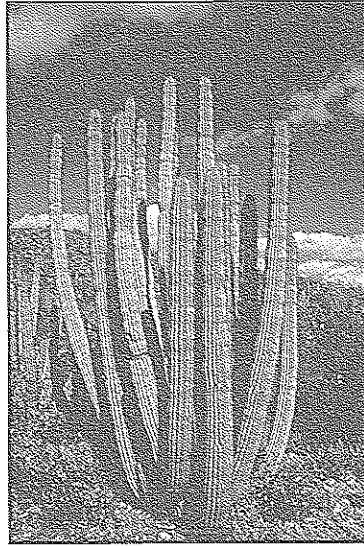
Pronunciation: La-mair-ree-o-KAY-ree-us THUR-ba-ree

Common Name: Organ pipe cactus

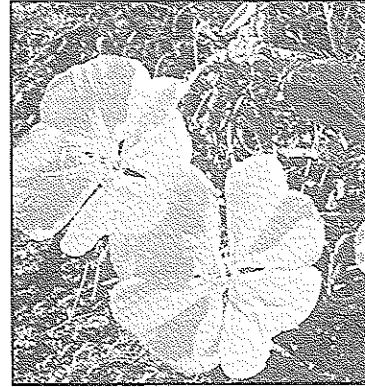
Family: Cactaceae (Cactus)

Pollinator: Moths, bats

Blooming May through June, the organ pipe cactus often grows with saguaros and chollas, forming "cactus forests" on the desert landscape.



William Bransford



William Bransford

Botanical Name: *Agave lecheguilla*

Pronunciation: A-GAH-vee le-che-GEE-ya

Common Name: Lecheguilla

Family: Amaryllidaceae (Amaryllis)

Pollinator: Bees, bats

Fibers from the leaves of lecheguilla were collected by Native Americans and woven into cloth.



William Bransford

Botanical Name: *Oenothera deltoides*

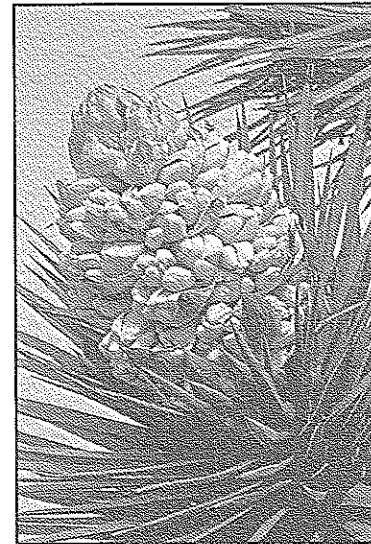
Pronunciation: Ee-no-THEE-ra del-TOY-dees

Common Name: Birdcage evening primrose

Family: Onagraceae (Evening Primrose)

Pollinator: Moths

Following periods of abundant rainfall, the blossoms of the birdcage evening primrose form a carpet of "tissue paper" on the desert floor.



Doug Sherman

Botanical Name: *Datura wrightii*

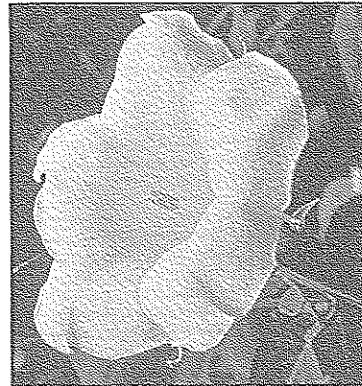
Pronunciation: Da-TEWR-a RIGHT-ee-i

Common Name: Jimsonweed, Southwest thorn apple

Family: Solanaceae (Nightshade)

Pollinator: Moths

Although all parts of the plant are poisonous, the narcotic properties of jimsonweed played an integral part in religious ceremonies of Southwest Native Americans.



Kimberly Kline

Botanical Name: *Yucca brevifolia*

Pronunciation: YOO-ka bre-vi-FOL-ee-a

Common Name: Joshua tree

Family: Liliaceae (Lily)

Pollinator: Moths

The largest of the yuccas, the Joshua tree was named by Mormons because they thought it resembled a person praying with uplifted arms.

HOTLINES

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F *From the* F E L D

NEW JERSEY:

(800) JERSEY7

NEW YORK:

(800) CALLNYS

NORTH CAROLINA:

(800) VISITNC

OHIO:

(800) BUCKEYE

OKLAHOMA:

(800) 652-6552

RHODE ISLAND:

(800) 326-6030

SOUTH CAROLINA:

(800) 849-4766

TENNESSEE:

(800) 697-4200

TEXAS:

(800) 452-9292

VERMONT:

(802) 828-3239

VIRGINIA:

Skyline Drive & Shenandoah National Park:

(540) 999-3500

Blue Ridge Parkway:

(704) 298-0398

WEST VIRGINIA:

(800) 225-5982

WISCONSIN:

(800) 372-2737

In addition, the National Forest Service runs the National Fall Foliage Hotline, which may be reached at (800) 354-4595. Have a great season!

NORTHEAST

Buffalo, NY: *Niagara Frontier Botanical Society General Meeting, September 10, Contact:* Niagara Frontier Botanical Society, Buffalo Museum of Science, 1020 Humboldt Parkway, Buffalo, NY 14211.

Washington Crossing, PA: *Explore Wildflowers: Quakertown Swamp, September 18, Knowing Native Plants: Asters and Goldenrods, September 28, Contact:* Bowman's Hill Wildflower Preserve, Box 103, Washington Crossing, PA 18977, (215) 862-2924.

ATLANTIC COAST

Richmond, VA: *The Perennial Symposium, September 13 - 14, Contact:* Lewis Ginter Botanical Garden, 1800 Lakeside Ave., Richmond, VA 23228, (804) 262-9887.

SOUTHEAST

Atlanta, GA: *Propagation of Flowering Herbaceous Plants, September 10, Contact:* Georgia Native Plant Society, Box 422085, Atlanta, GA 30342, (770) 392-9650.

Athens, GA: *Mushroom Trek, September 28, Contact:* The State Botanical Garden of Georgia, 2450 S. Milledge Ave., Athens, GA 30605, (706) 542-1244.

St. Francisville, LA: *Southern Garden Symposium & Workshops, October 11 - 12, Contact:* The Southern Garden Symposium, Box 2075, St. Francisville, LA 70775, (504) 635-4220.

OKLAHOMA/TEXAS

Austin, TX: *Wild Basin Walk, September 15, 21 & 28, Contact:* Wild Basin Wilderness, 805 N. Capital of Texas Hwy., Austin, TX 78746, (512) 327-7622.

El Paso, TX: *Flora of the Chihuahuan Desert and its Many Ecosystems, October 18 - 20, Contact:* Native Plant Society of Texas, Box 891, Georgetown, TX 78627, (512) 863-9685.

Houston, TX: *Coastal Prairie and Native Grass Symposium, October 24, Contact:* Evelyn Merz, 7095 Santa Fe Dr., Houston, TX 77061, (713) 644-8228.

MIDWEST

Gray Summit, MO: *Native Plant Conference: Biodiversity Begins at Home, September 6 - 7, Contact:* Scott Woodbury, Shaw Arboretum, Box 38, Gray Summit, MO 63039, (314) 451-3512.

St. Louis, MO: *Wildflower Identification and Ecology, September 28, Contact:* Missouri Botanical Garden, Kemper Center, Box 299, St. Louis, MO 63166, (314) 577-9441.

St. Charles, IL: *15th North American Prairie Conference, October 23 - 26, Contact:* Karl Becker, (217) 785-8774.

CANADA

Toronto, ON: *Groundworks '96: From Naturalization to Restoration, October 4 - 5, Contact:* The Evergreen Foundation, 355 Adelaide St. West, Toronto, ON M5V 1S2, CANADA, (416) 596-1495.



Foliage Fun

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Place a leaf vein-side up on the newspaper. Brush the leaf evenly with a light coat of paint (make sure the paint is right for your material).

Carefully pick the leaf up and place the painted side down on the material to be printed. Place a clean paper towel over the leaf and gently rub, printing the image of the leaf on the material. Try multiple colors

on one leaf, varied printing patterns, or printing on a variety of materials. For an extra touch, paint the names of the trees on your finished product!

Helpful Hints:

- Soft, pliable leaves work best
- Collect leaves as they fall for printing later (leaves collected before they dry out work better)
- Store your leaves in the refrigerator inside an air-tight bag with a damp paper towel – they will keep for weeks

that 1) they may germinate the first year and provide color, but because they are not native to your area (nor even to North America, in many cases), they might not return subsequent years, 2) they may not come up the first year at all, and/or 3) they might be species that are aggressively invasive and damage natural plant populations.

If your goal is a wildflower area that attracts pollinators, returns year after year as a mini-community of native biodiversity, and provides color

and seasonal beauty with minimal care, then a variety of regionally native plants is what you want.

Once you've selected your native plants, don't forget basic gardening guidelines! Site selection, soil, weed control, good seed/soil contact, and moisture must all be part of your planning, seeding, and management process. Just as with a nutritious, tasty, and well presented meal, "add water and stir" is not enough.

For information about ordering lists of regionally recommended native species, seed companies and nurseries offering native plants, and "how to" planting guidelines, write: *Clearinghouse, National Wildflower Research Center, 4801 La Crosse Avenue, Austin, Texas 78739.*
Have fun with your fall planning and planting, and enjoy a colorful wildflower spring!

Member's Notebook

One look at the Texas bluebonnets and Indian paintbrush and you know Frances and Ross Elliott are Wildflower Center members from Texas. Breckenridge, Texas, to be exact.



Frances Elliott

The two acres around their house are filled with native plants adapted to the

hot summers and severe weather of this town west of Fort Worth.

WILDFLOWER SERENADE

Sunday, October 13, is the Center's final Wildflower Serenade of the year, and features Don Walser and the Pure Texas Band. Enjoy a great night under the stars sponsored by Del Webb's Sun City Georgetown and KVET/KASE radio. For more information, call the Center's Special Events Office at (512) 292-4200.



NATIONAL WILDFLOWER RESEARCH CENTER
4801 LA CROSSE AVENUE, AUSTIN, TEXAS 78739

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- ✿ Membership Information, call (512) 292-4200
- ✿ *Wild Ideas: The Store*, call (512) 292-4300
- ✿ General Information, call (512) 292-4100

The August 11 Wildflower Serenade has been rescheduled for Sunday, September 15. For tickets, call 499-TIXS. For more information, call 292-4200.

Grow Native!
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