



# NATIONAL WILDFLOWER RESEARCH CENTER

# wildflower

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## Pollination: The Butterflies and the Bees

Long before the arrival of insects, prehistoric plants relied on the wind for their pollination. As a result, pollination often was a hit or miss proposition. Sometimes compatible pollen made it to the appropriate plant, sometimes it didn't. If the pollen did make it to the right plant, chances were still pretty slim that a particular pollen grain would actually land on a receptive stigma. All in all, an inefficient method of reproduction.

The arrival of insects had a dramatic effect on the evolution of flowering plants. Pretty flowers, attractive scents, and tasty nectar and food bodies, a waste of energy and material for wind pollinated species, became a definite advantage. And pollen hitching a ride on insects had a much better chance meeting the appropriate flower and a receptive stigma than their wind-borne counterparts.

As we look at the evolutionary history of flowering plants, it is obvious pollinators have co-evolved with their

plants. In fact, the relationship between some pollinators and their plants has become very specialized. Bees and butterflies are excellent examples of this, and certain flowers have evolved to maximize their chances of being pollinated by these insects.

Both male and female bees live on nectar, and the females collect pollen to feed their larvae. Adult bees have mouthparts that form a sucking tube containing a tongue. Body hairs on the legs and abdomen act as brushes that pick up pollen. Bristles on the third pair of legs form a comb that collects pollen from the abdomen and the brushes, forcing it into pollen baskets on the upper segment of the same pair of legs.

Bees can see color, although in a different spectrum than ours. Bee-pollinated flowers are generally showy and brightly colored, usually in shades of blue or yellow. Bees will overlook flowers in shades of red because the color

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### BIG BUGS Are Here!

After a cross-country odyssey, David Rogers' **BIG BUGS** garden exhibit is at the Wildflower Center. The much (*much*) larger-than-life dragonfly, spider, praying mantis, grasshopper, and ants (three of 'em) can be seen in the Center's gardens and on the grounds through the end of November. The exhibit is yours to enjoy free with admission, and each month will feature special "buggy" activities for all ages. Don't miss this truly unique exhibit!

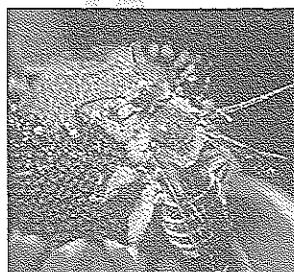
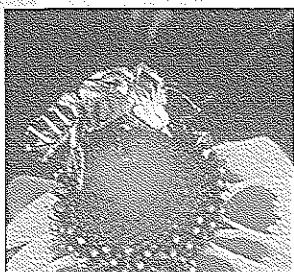
## A Taste of Honey

*Kim Lehman, President  
Capitol Area Honey Bee Stewards, Austin, TX*

Honey is a natural product made by combining the hard work of the honey bee with the nectar of flowers. To make just one pound of honey, bees have to visit about two million flowers!

Unfiltered, uncooked honey consists of 181 identified substances, including enzymes,

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*Photos by John L. Neff*

## Director's Report: A Walk on the *Wild Side*



By the time you read this Director's Report, I will be nearing the end of my tenure as Interim Executive Director. My time at the National Wildflower Research Center has coincided with the most glorious spring in several years. Enhanced by the beauty of our surroundings, the Center enjoyed the most successful spring in our history. Each of our special events exceeded financial and attendance expectations. It was a very good time to be among the wildflowers.

The focus of my work at the Wildflower Center was to strengthen and diversify the development program, expand education and national services, support the staff, and encourage the establishment of an endowment

program. There is clear evidence of progress in each of these areas. At the half-way point in the fiscal year there is renewed commitment of the Board of Directors, volunteers, and staff, and the Center is sound in both finances and programs. All areas of membership revenue are above projected mid-year goals. New foundation and corporate grant proposals have begun to strengthen funding for education programs and operating expenses.

Our commitment to expand our presence at the national level was launched at a symposium for governors' wives of four Southeastern states at Callaway Gardens in Georgia in April. The Wildflower Center will convene a national conference in 1998 for gover-

nors' spouses of all states, Department of Transportation officials, and representatives of allied organizations. The purpose will be to educate and unify all 50 states in the use of regionally native plants along our nation's highways and byways. The Wildflower Center's consultation program is providing initial planning services and connecting clients with a network of local experts for the creation of native landscapes. Currently, we are working with the Glynwood Conference Center in

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*Martha Farmer is the Interim Executive Director of the National Wildflower Research 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.*

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## Honor a Loved One with a Commemorative Bench

The Wildflower Center has a limited number of on-site commemorative benches available to honor or remember a loved one. Each bench can be marked with a small brass plaque naming the honoree and those who have given the bench in their honor (space permitting).



*Patsy Conway*

Existing benches may be dedicated, or new benches may be dedicated and placed according to the Center's landscape design plan.

Three styles of benches are available: a rustic limestone and cedar bench for the nature trails (\$3,000), or two styles of formal, plantation teak benches by Smith & Hawken (\$3,000 or \$5,000). Commemorative benches are dedicated for the life of the bench (about 20 years), and will not only ensure long recognition, but provide a welcome resting place for visitors.

For more information about the commemorative bench program, call the Development Office at (512) 292-4200.

## Pollination

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red appears black to them. Many bee-pollinated flowers also have special markings, called honey or nectar guides. While humans are unable to see these guides, bees, who can see in the ultraviolet light spectrum, have no problem following the guides straight to the goodies. Nectar guides are associated with landing platforms which provide a place for bees to sit.

Some of the more advanced bee-pollinated flowers have spring-loaded traps or complex passageways that force the bee to follow a particular route, which ensures the bee will come in contact with the anthers (picking up pollen) and stigma (depositing pollen). For example, the



Big jumping grasshoppers are waiting for you at the Wildflower Center.

anthers of penstemon (*Penstemon* spp.) are arranged so they tap the bee's back as it moves into the flower in search of nectar.

Other common bee-pollinated flowers include sages (*Salvia* spp.), violets (*Viola* spp.), milkweeds (*Asclepias* spp.), and lupine (*Lupinus* spp.).

Like bees, butterflies are attracted to flowers by a combination of sight and smell. Unlike bees, however, butterflies can see the color red, and visit red, blue, and yellow flowers. In fact, while some butterflies seem to prefer certain colors, most have no color preference and will visit any flower providing the tasty and nutritious nectar they seek.

Dainty, yet rather lazy, butterflies

# F From the F E L D

## New England

**Framingham, MA:** *Propagating Wildflowers in Summer, August 10, Contact:* New England Wild Flower Society, Garden in the Woods, 180 Hemenway Rd., Framingham, MA 01701, (617) 237-4924.

## Mid-Atlantic

**New Hope, PA:** *Wetland Plant Identification, July 26, Summer Wildflower Walk, August 23, Contact:* Bowman's Hill Wildflower Preserve, Washington Crossing Historic Park, Box 685, New Hope, PA 18938, (215) 862-2924.

**Stevenson, MD:** *Sixth Annual Native Plant Seminar, August 23, Contact:* Irvine Natural Science Center, 8400 Greenspring Ave., Stevenson, MD 21153, (410) 484-2413.

## Southeast

**Athens, GA:** *Piedmont Meadow Workshop, August 21, Contact:* The State Botanical Garden of Georgia, 2450 S. Milledge Ave., Athens, GA 30605, (706) 542-6156.

## North Central/Midwest

**Chanhassen, MN:** *Guided Tours of the Restored Prairie, July 6, 13, 20, 27, Contact:* Minnesota Landscape Arboretum, 3675 Arboretum Dr., Box 39, Chanhassen, MN 55317, (612) 443-2460.

**Madison, WI:** *Midwest Oak-Savanna & Woodland Conference, July 30-August 2, Contact:* Nancy Braker, The Nature Conservancy, 633 W. Main St., Madison, WI 53703, (608) 251-8140.

## Rocky Mountains

**Crested Butte, CO:** *Introduction to Grasses, July 9, Contact:* Gay Austin, USDA Forest Service, 216 N. Colorado, Gunnison, CO 81230, (970) 641-0471.

**Crested Butte, CO:** *Wildflower Tour, August 2, Contact:* Vinnie Rossignol, Box 861, Crested Butte, CO 81224, (970) 349-5682.

**Crested Butte, CO:** *Native Plant/Revegetation Workshop, August 26-28, Contact:* CSU Cooperative Extension, 275 S. Spruce, Gunnison, CO 81230, (970) 641-1260.

## Southwest

**Flagstaff, AZ:** *Wildflower Walk of the Upper West Fork, August 23, Contact:* The Arboretum at Flagstaff, S. Woody Mountain Rd., Box 670, Flagstaff, AZ 86002, (520) 774-1442.

## California

**Berkeley, CA:** *Jepson Herbarium Weekend Classes, July 11-13 (Carex spp.), July 18-20 (Eriogonum spp.), July 25-27 (Wetlands), August 1-3 (Chenopodiaceae), August 8-10 (Alpine Flora), Contact:* Susan D'Alcama, Jepson Herbarium, 1001 Valley Life Sciences Bldg., #2465, U. of California, Berkeley, CA 94720, (510) 643-7008.

## Northwest

**Portland, OR:** *24th Annual Natural Areas Association Conference & Exotic Pest Plant Council Conference, August 27-30, Contact:* Natural Areas Association, 320 S. Third St., Rockford, IL 61104, (815) 964-6666.

For more native plant-themed events, check out the Wildflower Center's web site at [www.wildflower.org](http://www.wildflower.org).

like to sit while they sip their nectar, and tend to prefer flowers that offer a sturdy landing platform. Nectar guides or mechanical tongue grooves on the flower petals guide their long tongues to the rich nectar located at the base of long slender floral tubes.

Butterfly-pollinated flowers include milkweeds (*Asclepias* spp.), lantana

(*Lantana* spp.), and phlox (*Phlox* spp.).

Butterflies and bees are not the only insects that are important in the garden. Beetles, moths, and even flies perform important pollination duties.

So, the next time you're tempted to apply the bug spray, stop and think! You might be eliminating a good friend.

## Honey

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minerals, and amino acids, and the flavor and color of honey depends both on the nectar sources visited by the bees and the time of year the bees visit them.

Goldenrod (*Solidago* spp.), common throughout the United States, is one of the most important nectar sources in New England, and yields an amber honey described as having a fair to good flavor. Nectar from tupelo trees (*Nyssa* spp.) from the swamps of the Southeastern United States is pale golden and very aromatic, while honey made by bees feeding on salvia (*Salvia* spp.) plants (particularly in California) is water-white with a heavy body and a delightful flavor.

Central Texas has three main nectar sources – mesquite (*Prosopis* spp.), horsemint (*Monarda citriodora*), and Indian blanket (*Gaillardia pulchella*). Mesquite, one of the first sources in the spring, produces a light, mild flavored honey. Horsemint and Indian blanket honey is clear amber; however, horsemint honey usually has a minty flavor while Indian blanket honey has a stronger, more distinct taste.

The time of year also affects

the look and taste of honey. Spring honey is generally lighter in color, while honey made from fall-blooming species is darker and heavier.

The next time you take a taste of honey, be sure to thank the honey bees and the flowers for their great teamwork.

### We Need Your Help!

Please send us the names, addresses, and phone numbers of your favorite *native plant* nurseries, growers, and landscapers so we may continue to improve our Clearinghouse databases. Without your help, we might miss giving deserving businesses proper credit in our effort to serve our members and other native plant enthusiasts.

### Talking about Native Plants

"The solution is native plants. They give insect pollinators floral McDonald's along their highways of life."

– Stephen Buchmann, Co-Director  
*The Forgotten Pollinators Campaign*  
Speech at the Wildflower Center

## A Walk on the Wild Side

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Hudson River, New York, and at Sendero Ranch near San Antonio, Texas. Preliminary talks also are underway with Chubu Electric in Japan to develop landscapes at their Japanese headquarters using regionally native Japanese species. Finally, a major Endowment Campaign was inaugurated at the Board of Directors meeting in May with a significant financial commitment from Mrs. Lyndon B. Johnson.

Although I will no longer be a daily presence at the Wildflower Center, I will remain connected with the organization as a consultant to the development program and director of the Endowment Campaign. All is in readiness for a new leader, and it is anticipated the work of the Search Committee will be completed by summer's end. As the Wildflower Center moves from strength to strength and prepares to welcome a new Executive Director, your continued support is encouraged. It has been a glorious experience to serve as the Wildflower Center's Interim Executive Director – thank you for a joyous WALK ON THE WILD SIDE!



NATIONAL WILDFLOWER RESEARCH CENTER  
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