

WILDFLOWER

A nonprofit organization dedicated to researching and promoting wildflowers to further their economic, environmental, and aesthetic use.

Native Plants: Cold, Hard Facts

Scenes of winter in North America include the spectacle of *Symplocarpus foetidus*, or skunk cabbage, blooming in ice and snow. The feat illustrates the phenomenon of adaptation to the environment. *S. foetidus* and other plant species have developed complex mechanisms for weathering cold temperatures.

Skunk cabbage, a wetland wildflower which has a disagreeable odor when bruised, grows in areas of Canada southward to Georgia, Tennessee, Illinois and Iowa. The plant is able to tolerate cyanide internally and releases the substance in cellular respiration, melting surrounding snow and ice. The spathe of the plant works its way up through the softened soil to bloom from February to May. Henry David Thoreau noticed that skunk cabbage plants near his home in Concord, Mass., were already beginning to form spathes in early autumn. Thoreau wrote about them in his journal:

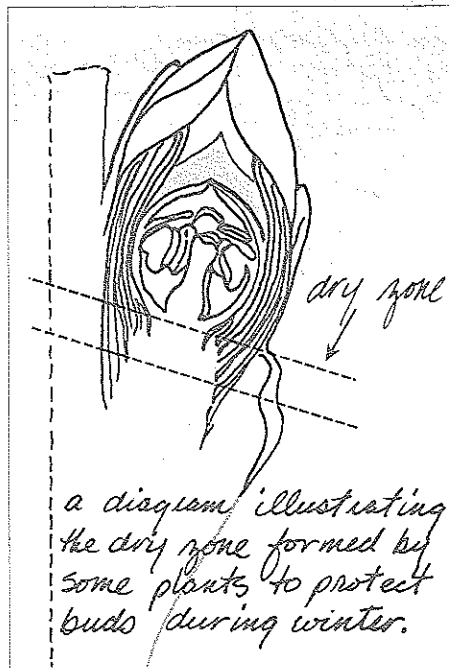
"They see over the brow
of Winter's hill.
They see
another Summer ahead."

Many plant species, such as *Cornus stolonifera*, or red-osier dogwood, undergo the physiological process of hardening off to prepare for freezing temperatures. *C. stolonifera* starts hardening off in response to decreasing hours of daylight in fall: pigment production shifts from green to red; the plant increases production of the hormone, abscisic acid; and leaf drop occurs. The plant goes into a state of dormancy by halting the process of

moving water through its tissue so that minimal water remains to freeze and rupture cell walls. Some species protect flower buds by forming a dry zone, which prevents water from entering the buds. Warm weather signals this barrier to dissolve. Buds are then vulnerable to a late freeze.

A number of evergreens overwinter by dropping their internal temperatures below freezing and allowing their tissue to freeze at a slow rate. Ice crystals actually form between cells, outside of the cell walls. But because freezing occurs at a controlled rate and not inside the cells, cell walls are not damaged.

The roots of most plants are susceptible to freezing because they rarely experience it. Soil temperature is higher than air temperature, so roots have not needed protective (Continued on page 4)



Winter Botany

Perusing seed catalogs offers some solace to wildflower admirers over winter. However, as strange as it seems at first thought, winter is a wonderful time to botanize outdoors.

Many grasses fruit in the fall, and their flowering stalks can be spectacular in the winter. Grasses that have been transformed to ice formations are a popular subject for photography. Trees and shrubs, of course, remain through the winter and, with a guidebook, can be identified by leaf scars, bark, and shape. Many are bearing or have remnants of fruit and seed.

Winter fruit and seed are an enormously important food source for resident birds. Seeds are often flashy and brightly colored; red is especially visible to birds. Many animals, in fact, are heavily dependent on fruit and seed for winter food. The dependence is reciprocal, since animals often carry seeds to new sites.

This phenomenon is so important that diverse adaptations to dispersal agents can be found in seeds. Some seeds have barbs, spines, or sticky hairs adapted to adhere to animal fur. Others have wings, tufts of hair, or plumes, and are light enough to be transported by wind. Cork-like seed coatings or buoyant fibers allow seeds to float on water. Winter is one of the best times to observe these adaptations.

John Averett, Ph.D.,
Research Director,
National Wildflower Research Center

Director's Report: Poster for Schoolchildren

We are delighted to report an excellent response to our appeal for help with a project that we feel has enormous national potential. You, our members, have responded to the need to produce an educational poster for schoolchildren, and we are now well under way in the development of design and content. We have selected Anne Ducote as illustrator, and Patty Alvey as designer and production artist for the poster, while one of our staff members, Beth Anderson, will coordinate the text.

Current plans call for the front side of the poster to be filled with beautiful, full-color seasonal illustrations of many of our nation's most representative wildflowers and native grasses, shrubs and trees. The flip side of the 17- by 22-inch poster will include fun and informative "Did You Know?" facts about wildflowers; a flower diagram to be labeled; illustrated learning activities such as matching games, a crossword puzzle, and fill-in-the-blank questions; suggestions for outdoor activities and projects;

and information on plant life cycle stages, and on fruit and seed dispersal mechanisms, flower pollination, and other interactions between plant and animal species.

Our intent is to include material that is both educational and fun to learn in a colorful and attractive framework. The front side of the poster will make an attractive display which can be framed once the educational materials on the back have served their purpose. The illustrations on the front will be accurately drawn and identified by both common and scientific names for long-term educational benefits.

Our first goal is to have the poster ready for limited distribution and evaluation this coming Spring, 1989. Those of you who have supported this project with donations, and have requested that copies be sent to you or to schools of your choice, will be invited to respond with comments so that we can consider suggestions for adjustments or changes before the final printing.

Our second goal is to identify national and regional corporations and

individuals able to sponsor the printing of thousands of copies of this poster, so that we can respond to requests for posters from schools and individuals across the country. We would very much prefer to distribute the posters free of cost, with an acknowledgment identifying the sponsor printed on each, rather than to resort to selling them in order to print quantities large enough for distribution.

So if you know of a potential sponsor, please let us know. From what we can tell at this stage of development, the poster will be both a beautiful and informative piece which will merit distribution nationwide. And, to those of you who have made this project possible through the first phase, thank you!

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



Wildflower

Founder: Lady Bird Johnson
Executive Director: David K. Northington, Ph.D.
Editor: Candace Kiene
Art Director: Patty Alvey
Copy Editors: Beth Anderson, Jim Hankins

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Wildflower Center News

This spring in the Houston metropolitan area, wildflowers will bloom in an experimental planting along a pathway in Bellaire's Russ Pitman Park. If rainfall is adequate the planting will demonstrate, as part of a project involving The Park People, Inc., of Houston, and the National Wildflower Research Center, that even in Houston's gumbo soil wildflowers will function as borders in landscapes.

The planting is one of six that The Park People, a nonprofit group working to improve Houston's parks and open spaces, organized around a planting seminar and demonstration presented by the Wildflower Center and The Park People last October in Houston. Satellite plantings were also
(Continued on page 4)



Magic Touch: "Wildflower Fairy" Eva Pressler adds the last touch of fairy dust to a bluebonnet she has face painted on a visitor to the Wildflower Center, during November's "Wildflower Days." (Photo by Sam Luna)



inside herbaria

Less than 50 years after the United States had become a nation, the country's first herbarium was established: the herbarium of the Academy of Natural Sciences in Philadelphia, founded in 1812. The academy also included a library and, as the country's most important early botanical institution, was where naturalists sent plant specimens during the early years of the republic.

The academy's herbarium now contains more than a million specimens. Other herbaria that have developed across the country have greatly expanded knowledge of North American flora.

An herbarium is a plant library which contains dried samples of plants instead of books. Samples (of whole plants if possible) are dried flat and mounted on acid-free paper with a label stating the plant's name, where it was found, the date it was collected and who collected it, and notes on soil and adjacent vegetation.

Botanists use herbarium specimens to distinguish and name plant species. Once plants have been classified they can be inventoried, and their presence or absence in different regions can be recorded. When researchers describe and name a new species, the range or distribution information recorded often comes directly from herbarium data.

If a uniform name is established for a plant species, botanists and horticulturists worldwide can communicate about its range and potential usefulness. On how many continents is *Nicotiana glauca* or tree tobacco found? (At least three.) Does it have value as a crop or landscape plant? (In some areas.) Researchers can also alert each other to the possible

extinction of a species. Herbaria can aid in the reconstruction of plant communities, as well. Many times a species collected from a site years ago has disappeared. By examining location data from labels, researchers can tell which species were once there — although not in what proportions they originally occurred.

The National Wildflower Research Center has established an herbarium to use both in identifying field material and in cataloging native plants with potential use in landscapes. Many wildflower species grown for the Center's seedling identification photography project have been mounted in the seedling stage. This feature makes the Center's small collection unique: most herbarium specimens are of adult plants only.

Small-scale herbaria have often developed into major resources. Dr. Willis Linn Jepson (1867-1946), who was the first student to obtain a Ph.D. in botany at the University of California at Berkeley, began a private herbarium to study California native plants. Jepson eventually collected some 70,000 specimens and willed the collection to the university, with funds for expansion. The Jepson Herbarium now contains over 85,000 specimens, and is the only herbarium in California that works solely on California native plants.

Larger herbaria that maintain worldwide plant material include the National Herbarium at the Smithsonian in Washington, D.C., and the herbaria at the Missouri Botanical Garden and the Field Museum of Natural History in Chicago.

*Katy Kramer McKinney,
Research Botanist,
National Wildflower Research Center*

From the Field

Society for Ecological Restoration and Management (SERM) First Annual Meeting Jan. 16-20, Oakland, Cal. Covers topics relevant to ecological restoration. **Contact:** SERM, University of Wisconsin-Arboretum, 1207 Seminole Highway, Madison, Wis. 53711.

American Seed Trade Association-Vegetable and Flower Seed Conference Jan. 17-21, Fairmont Hotel, Dallas, Texas Home Garden Division meets Wednesday morning, Jan. 18; conference is Thursday afternoon, Jan. 19. **Contact:** American Seed Trade Association, 1030 15th Street NW, Suite 964, Washington, D.C. 20005; (202) 223-4080.

Society for Range Management (SRM) Annual Meeting: "Rangelands Progress and Promise" Feb. 19-24, Billings, Mont. *Vegetative Rehabilitation and Equipment Workshop* is on Sunday, Feb. 19. *SRM Trade Show* is Monday through Wednesday, Feb. 20-22. **Contact:** For more information, call (303) 355-7070.

Transportation Research Board Annual Meeting Jan. 22-26, Washington, D.C. Committee meetings scheduled include: *Landscape and Environmental Design*, Monday, Jan. 23, 9 a.m. at the Sheraton Washington; and *Wetlands and Rest Areas*, Monday, Jan. 23, 2 p.m. at the Sheraton Washington. **Contact:** Transportation Research Board, 2101 Constitution Ave., Washington, D.C. 20418; (202) 334-2934.

Rhode Island Wild Plant Society (RIWP): "Meadow Gardening in New England" Jan. 14, 1 p.m., Smithfield, R.I. General meeting of RIWP, at Audubon Society of Rhode Island Headquarters, 12 Sanderson Rd., Smithfield, R.I. **Contact:** RIWP, (401) 949-0195.

News (cont. from page 2)

held at other Houston parks, arboreta, and public places. Some 30 organizations and businesses helped sponsor the series of events.

Over 300 people from 27 Texas towns and Louisiana attended the standing-room-only seminar at the Harris County Extension Service Building. Wildflower Center staff speaking at the seminar and follow-up demonstration planting in Cullen Park were David Northington, Executive Director; John Averett, Research Director; Elinor Crank, Research Horticulturist; and Katy McKinney, Research Botanist.

"The Park People did a tremendous job of getting a crowd out," notes Dr. Averett. "Most were managers of large-sized tracts, from parks to flood control districts to con-

servation areas. It was a large number of people who will have a public impact, a good combination."

The Park People worked with several Wildflower Center trustees and Houston friends of Lady Bird Johnson, founder of the Center, to organize the events as a 75th birthday gift to Mrs. Johnson. Wildflower Center Trustee Terry Hershey, chairperson of The Park People's advisory board, chaired the organization's steering committee for the seminar and plantings.

Carlton B. Lees, coauthor with Lady Bird Johnson of *Wildflowers Across America*, has provided an errata sheet for the book. For a copy of the sheet, send a self-addressed, stamped envelope to: *Wildflowers Across America* Errata, NWRC, 2600 FM 973 North, Austin, Texas 78725.

Winter Facts (cont. from page 1)

mechanisms. Following are some steps to take - now and next fall - to help plants overwinter:

- In warm climates, if the winter is unusually cold and dry, water the soil around plant roots to insulate them from freeze damage. In colder areas, snow provides natural insulation, which many plants rely on.

- In early fall, water and fertilize less to facilitate the drying down process and minimize new growth, which will be vulnerable to freezes. Mulch root bases during the fall to insulate roots and keep the soil temperature as high as possible.

Elinor Crank,
Research Horticulturist,
National Wildflower Research Center

Plan for Spring: Join the National Wildflower Research Center

Members of the National Wildflower Research Center support wildflower work across the nation. Benefits include *Wildflower*, the newsletter and *Wildflower*, the journal; 10% discount on unique Center products such as wildflower books, calendars, T-shirts and sculpture; special advance notice of and discounts to Center seminars; wildflower tours; a membership card and priority handling of requests to the Center's Clearinghouse of wildflower information.

- \$25 Supporting Member.** All benefits listed above.
- \$50 Sustaining Member.** All the above plus a set of specially commissioned wildflower note cards.
- \$100 Key Member.** All the above plus wildflower garden apron and invitations to special events.
- \$250 Center Sponsor.** All the above plus annual limited edition wildflower poster.
- \$500 Trust Member and \$1000 Benefactor.** All the above plus special privileges.

• Thank you! Your contribution is tax deductible to the extent permitted by applicable law.

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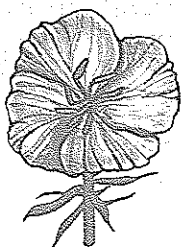
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(512) 292-4200