

Observations from LeRoy Brady — President of the Society

The Native Plant Society, through the chapter programs, has made significant advances in terms of programs educating ourselves as members and the public on native drought tolerant plants. Our field trips have helped us to expand our knowledge of our native flora and fauna.

Look around as you drive down a major arterial street (the traffic allows ample time) and note that on occasion you will see a development with an appropriate landscape using low water requiring trees, shrubs and ground covers. These landscapes are tastefully done. They are not barren, but exemplify the use of water conserving plants to create welcome shade, provide interest through their contrasting texture and form, and please the eye with color.

However, we have a great deal of educating and selling to do because these landscapes are but a minority. How many new developments have we seen that show almost an abhorrence of any character or planting that looks like it is part of, adapted for or belongs in our desert climate? Look closely at the trends and character of our landscapes. How many are going in that look like they belong in a climate with 42 inches annual precipitation, or alongside a beautiful lake in upstate New York or Minnesota?

Realistically, our rainfall is less than a quarter of that, and the natural lake is clear water which comes from the earth hundreds of feet down and is rapidly getting deeper.

The pressure for the green California look we are told, is based on salability. Then, after the sale is done and the money spent on image, think how long it will be before those who bought are going to be willing to spend more money to redo so that water use will fall within the required mandates.

Our geographical location and climate are not variables. Our attitude toward the desert and environment is the variable and can be changed by educating and increasing our awareness.

It is my opinion that we are at a crossroads now, today, this year. Look at the growth. The natural desert flora in Scottsdale that was there yesterday, is gone today. In its place are lakes, roads, houses, and condos. In Tucson the beautiful mesquites that line US-89 are gone for a wider highway and a new industrial development. What was once beautiful desert adjacent to I-10 at Picacho Peak State Park has been flattened and terraced. These are just a few locations out of hundreds.

Sharing the common interest of protecting and perpetuating the use of native plants and the need for your participation in furthering the goals of the ANPS has never been greater.

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The
Arizona
Native
Plant
Society

Flagstaff
Phoenix
Prescott
South Central
Tucson
Yuma



The
Plant
Press

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Mountain lover, manzanita and more at the Transition Zone Horticultural Institute

Nestled in the ponderosa pines outside of Flagstaff, with Woody Mountain to the southwest and the San Francisco Peaks looming in the North is the Transition Zone Horticultural Institute. The site of the Institute was formerly the home of Francis McAllister, built in 1967 on land purchased by her husband John V. McAllister in 1935. The McAllister's had a longstanding interest in the natural environment. Two hundred acres have been dedicated to researching techniques that will enable people to garden more successfully in the dry, mountainous areas of the west and to better understand the natural environment. Research will focus on plants that are native to the Colorado Plateau, at least during the early years.

Some exciting developments have occurred since the establishment of the Institute in 1981. The Board of Directors, with staff assistance have developed written policies on collections, research, and education. Site inventory and analysis of the 200 acres is presently underway, just one phase of a comprehensive master planning effort that will be carried out over the next few years. A horticultural complex and lath house have been constructed and have facilitated the propagation and production of about 200 species of native plants.

Over 15 species of plants are being tested for use as groundcovers; pussytoes, prostrate beardtongue, mountain lover and fringed sagebrush to name a few. Tucked away in the lath house, many shrubs such as manzanita, fernbush, roundleaf buffalo berry and red elderberry are being held over winter. Wildflowers for use in a rock garden or a planting to attract hummingbirds are scattered in various holding beds on the grounds.

Perhaps most important is a commitment we share with other botanical gardens in the state and around the country toward the conservation of endangered, rare or

threatened species. To this end, we are beginning work with the Center for Plant Conservation at the Arnold Arboretum, to grow *Pediocactus knowltonii* and will continue to conserve other plants that are in danger.

Summertime is the best time to visit the arboretum. It is located seven miles southwest of Flagstaff on Woody Mountain Road (F.S. Rd. 232). Please call ahead for an appointment. For more information call or write to Transition Zone Horticultural Institute, P.O. Box 670, Flagstaff, AZ 86001, (602) 774-1441.

Jeanette Milne
Botanist

Transition Zone Horticultural Institute

Observations *from front page*

The society has established many committees to provide information and help extend the goals of our organizations efforts. The following is a listing of the committees and their chairpersons. Search out those areas that are most interesting to you and contact the chairperson. Expand your knowledge and our awareness of our environment by becoming a member of one of these committees: Landscape and Plant Materials, Warren Jones, Tucson Chapter, 621-7149; Water Conservation, Dr. Charles Sacamano, Tucson; Education, Dr. Paul Bessey, 621-5586; Rare and Endangered Plants, Mary Butterwick, Phoenix Chapter, 581-1996; Publications, Marc Mittleman, w-562-3838 or h-265-0670; Membership, Vice President, Bill Kennison, 836-8243.

Welcome New Members

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Joanne Oellers

TUCSON

Joanne Gallaher
S. Lee Benson
Susan Fleming
Lane Johnson
Mort Womack

FLAGSTAFF

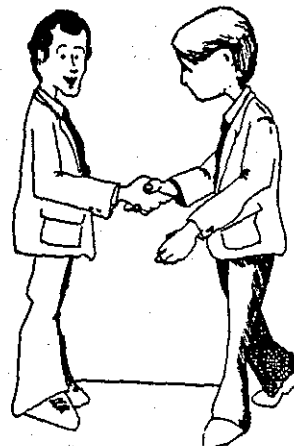
Brad & Elizabeth Blake

UNAFFILIATED

Neal Holmgren
New York Botanical Garden
Bronx, New York

SOUTH CENTRAL

Thelma Beach
Ralph & Betty Boldin
Winifred Fossen
Duane & Alice Porter
Charles & Margaret Ross
Shirley Weik



Research increases on nitrogen fixation

Nitrogen makes up 78% of the earth's atmosphere. Despite the abundance of this element, nitrogen is frequently a limiting factor in plant growth. This is due to the inability of most organisms to utilize atmospheric nitrogen (N_2) in the synthesis of amino acids and other nitrogen containing compounds. Consequently most plants must depend upon nitrogen contained in soil minerals, organic material in the soil or on artificially produced fertilizers.

Manufacture of nitrogen fertilizers, their storage, distribution and application consume more fuel than any other single aspect of American crop production. It takes about 30 cubic feet of natural gas to industrially

"Manufacture of nitrogen fertilizers, their storage, distribution and application consume more fuel than any other single aspect of American crop production."

produce one pound of plant-usable nitrogen. This has prompted an increase in basic research on biological nitrogen fixation.

Strictly speaking plants do not fix nitrogen, rather microorganisms which form symbiosis with them fix nitrogen via a multi-step enzyme-catalyzed process which converts atmospheric nitrogen to ammonium (NH_4^+). The host plant supplies the microorganism with nutrients and in return the microorganism supplies the plant with a usable form of nitrogen.

Rhizobia are nitrogen-fixing Gram (-) bacteria which form a symbiosis with members of the pea family (Leguminosae) such as alfalfa, soybean and peanut. This association has been intensively studied and a great deal is now known about the process of infection, root nodule formation, and other complex interactions which occur between the plant and bacteria.

Less well known is the symbiotic association of a filamentous nitrogen-fixing bacterium of the genus *Frankia*, with non-leguminous plants such as members of the rose (Rosaceae), buck thorn (Rhamnaceae), birch (Betulaceae), and oleaster (Elaeagnaceae) families. Arizona species include *Cowania*, cliff rose (Rosaceae), and *Ceanothus* (Rhamnaceae).

Some members of the rose family, such as apple (*Malus*) and raspberry (*Rubus*), are economically important; however these plants do not normally form symbiotic associations with nitrogen-fixing bacteria.

Researchers have suggested the possibility of transferring the nitrogen fixation genes from these microorganisms to the plants thus bypassing the symbiosis and thereby enabling plants such as apple to fix nitrogen. However since multiple genes are involved the likelihood of success is difficult to assess.

Another strategy being investigated involves the expansion of the host range of the bacterium *Frankia*. Root nodules of cliff rose have been collected, and the

filamentous bacteria have been isolated. At Arizona State University, both cliff rose and its non-nitrogen fixing relative apache plume (*Fallugia*) have been grown in test tubes using tissue culture techniques. Researchers there have "micro-grafted" shoots of apache plume onto root-stocks of cliff rose. It is hoped that the nitrogen-fixing bacteria will "recognize" the cliff rose roots, successfully infect them and the normally non-fixing apache plume will reap the benefits.

Margaret L. Gallagher
Botanist

Department of Botany and Microbiology
Arizona State University

Show Us Your Photos!

Do you have an interesting photograph of an Arizona native plant that the members would enjoy? We would love to display your talents in the Plant Press newsletter and who knows, it could be the first step towards national recognition!

Please send your favorite PRINT (not negative) and a descriptive paragraph. Also include a brief biography about yourself and the type of camera used. It is important to include your address and phone number so you can be contacted about contests!

You may send photos to:

Rosalind Bentley
Graphic Designer/Plant Press Newsletter
c/o PHOENIX MAGAZINE
4707 N. 12th St.
Phoenix, AZ 85014
602/248-8900

Members have opportunity to review Environmental Impact Statements

The Bureau of Land Management (BLM) draft environmental impact statements (EIS) will be available for comment in late January or February. They are the Draft Wilderness EIS for Phoenix Wilderness Areas, the Draft Resource Management Plan - EIS for Lower Gila South, and the Draft Resource Management Plan - EIS for the Yuma District. Members interested in receiving copies of the first two documents may write the District Manager at:

Bureau of Land Management
Phoenix District Office
2015 West Deer Valley Road
Phoenix, AZ 85027

For copies of the Yuma EIS members may write the District Manager at:

Bureau of Land Management
Yuma District Office
P.O. Box 5680, 2450 Fourth Ave.
Yuma, AZ 85364

Members need to contact BLM soon in order to be assured of receiving copies of these documents.

BLM will be coming out with the Draft Eastern Arizona Grazing EIS in June. Public meetings in regard to this EIS are scheduled sometime in July. This EIS will address grazing allotments in the Phoenix Resource Area and in the Safford District. Members may write the Phoenix District Office for copies of the EIS.

Land management plans and EISs are usually massive documents that can be difficult to evaluate. In order for the Society to effectively comment on these documents a review committee needs to be organized. Committee members will learn how to analyze planning documents and EISs and to determine whether or not botanical concerns are being adequately addressed. Land managers for these federal agencies need to be made aware that an interested public *does* exist. Letters from the Society and from individuals *can* make a difference. Members interested in participating on the Review Committee please contact Mary Butterwick during the day at 863-4464 or in the evening at 897-8053.

Also:

1985 Land Use Planning Schedule for Forest Service and Bureau of Land Management

The U.S. Forest Service will be coming out with several draft Land Management Plans either in late Summer or early Fall. These planning documents will then be available for a 90-day public comment period. It is important that Society members take this opportunity to learn how the Forest Service proposes to manage its land and to make sure that rare plant habitats, unique plant communities, and Research Natural Areas are adequately addressed in these documents.

Members interested in getting on the mailing list to receive land management plans, environmental assessments for projects affecting rare plants, or new Research Natural Area proposals should write to the Forest Supervisor of each forest.

Coconino National Forest
2323 E. Greenlaw Lane
Flagstaff, AZ 86001

Coronado National Forest
301 W. Congress
Tucson, AZ 85702

Apache-Sitgreaves National Forest
P.O. Box 640
Springville, AZ 85938

Kaibab National Forest
800 S. 6th St.
Williams, AZ 86046

Tonto National Forest
102 S. 28th St., P.O. Box 29070
Phoenix, AZ 85038

Prescott National Forest
344 S. Cortez
P.O. Box 2549
Prescott, AZ 86301

Mary Butterwick
Botanist
Bureau of Land Management
Phoenix District Office

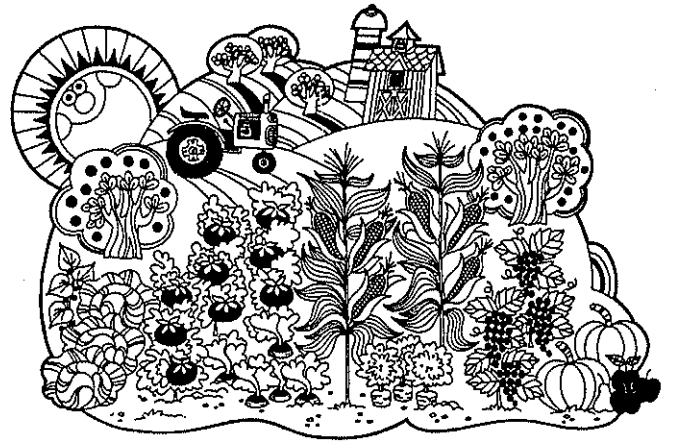
Annual Cactus Show and Sale

Feb. 16-24

Desert Botanical Garden

1201 N. Galvin Pkwy.

This annual event includes display and sale of many cacti varieties. Free with Garden admission. 941-1225



BOYCE R. FOERMAN'S

Annual Gardening Summary

JANUARY's mild, sunny days can be interrupted by freezing nights in southern Arizona, so gardeners should be alert to frost warnings and be prepared to protect freeze-tender plants. Cold nights also slow the growth of garden vegetables, flowers and winter lawns, and response to fertilization will be slow. Foliage can be expected to dull with prolonged exposure to desert winters. Don't anticipate much recovery before warming spring weather arrives.

Water cautiously during this season. Maintain good soil moisture, but needless watering further cools the ground and increases chances of fungus diseases.

It's the season for bare-root planting of deciduous trees, shrubs and roses. January through early February is also best for pruning deciduous trees, shrubs, grape vines and roses, as well as any corrective thinning and shaping that may be needed by evergreens.

Overseeded winter lawns and vegetable and flower gardens may need a light fertilization by the end of the month. And it is time to get the soil prepared for spring gardens.

FEBRUARY brings longer, warmer days and the danger of freezing nights normally diminishes by the middle of the month. It's the threshold of spring, so expect deciduous fruit trees to burst forth with bloom this month. And, remember, Arbor Day falls on the first Friday of February in the milder, lower elevations of Arizona.

Citrus trees should be pruned and fertilized during the beginning of February. Fertilize other trees, shrubs and roses now, too.

With warming weather, expect aphids to infest tender foliage. Be prompt with controls and attentive to reinfestations. Watch for worms in vegetable and flower gardens. Weeds can be expected to emerge in increasing numbers, especially following rainy weather. If contact herbicides are used, apply them while weeds are young and growing rapidly. Midday applications seem more effective during cooler seasons.

Spring vegetable gardens are best planted from mid-February through mid-March.

MARCH ushers in the spring season. Weather is beautiful and the delightful fragrance of citrus blossoms permeates the atmosphere. By now, deciduous fruit trees have set their new crop of fruit and are filling their twigs with new leaves. Noticeable shed of older, winter-stressed leaves from citrus trees and some other broad-leaf evergreens is most evident about now, as new foliage starts.

It's a good time to prune back, thin and restore proper shape to hedges.

Expect nitidulids and thrips to be attracted to cut flowers and rose and citrus blooms. Continue to be alert to aphid and worm infestations on vegetables and flowers.

By late March, seed heads begin to appear on winter weeds. Allowing them to mature is asking for even more weeds next year. Mowing them before they mature is usually the most practical control this late, but don't expect one mowing to do the job. Chemical weed killers have decreasing effect as weeds mature.

Gradually increase watering frequencies as the weather warms.

APRIL weather continues to be great for gardening; however, daytime temperatures may approach 100 degrees later in the month.

It's an appropriate time to plant citrus trees, other freeze-tender landscape plants and summer-blooming flowers. Bermuda and hybrid Bermuda lawns should be dethatched later in the month. Those lawns overseeded with winter grass are best converted back to the underlying summer grass at this time by the same dethatching process. After dethatching, water thoroughly but do not fertilize until the Bermuda grass growth has recovered.

Spider mites spread by spring winds can be expected. Discourage them by weekly rinsing susceptible plants with a fine spray of water.

As the onset of warming weather dries up winter vegetation, nuisance migrations of various insects may become annoying to residents of nearby landscapes, particularly those adjacent to native desert areas.

MAY is the prelude to summer. Little or no rain normally is expected; occasional winds can be anticipated.

This drying season, with temperature often exceeding 100 degrees later in the month, usually provokes excessive drop of newly set citrus fruits. Tender, new foliage of ash and other trees may suffer so-called wind burn. Expect noticeable leaf drop from bottle trees, sumacs, carobs and pines as weather gets hot. Shallow-watered and moisture-stressed trees are first affected. Replenishing the deeper rooting zones of more mature trees with a prolonged watering now would be beneficial, for they can ill-afford a setback at the onset of summer.

Lawn fertilization followed by a good, deep watering, is recommended now. All watering frequencies should approach summer schedules by the end of the month.

New Bermuda grass lawns can be planted from late April through July. Lawn insects may become troublesome during this season, so an insecticide application may be in order.

Expect population buildups of roaches, darkling beetles, black widow spiders, scorpions, sowbugs and other nuisance pests during warm seasons. Some may venture indoors if not controlled.

Spring flower and vegetable gardens phase out with late May's hot, dry weather. If it is not already done, it's

time to get sunburn protection applied to the tender bark of trees. Organic mulches applied under roses now will help prevent excessive heat buildup in their root zones during the long, hot summer ahead.

JUNE introduces the summer season, according to the calendar, but weatherwise, it comes to Phoenix in May. It's the hottest, driest month and the most stressful to local landscape plantings. Due to the persistent 100 to 110 degree temperatures of the next two months, they'll get little opportunity to recover until September.

Desiccation and sunburn of foliage can be expected, particularly on marginally adapted plants. We should attentively water to maintain near optimum root-zone moisture during this season, but avoid over-wet soils.

It is an appropriate time to give citrus trees their second fertilization. Lawns and flower beds would also benefit from a fertility boost about now.

Insect activity is somewhat suppressed by June's hot, dry weather; however, expect spider mites and lawn pests to persist. And cicadas, erroneously called locusts, can be expected to make their seasonal debut.

Deciduous fruits, such as peaches, apricots, plums and grapes, ripen this month. Expect birds to compete for the harvest.

WATERING GUIDE

Established Plants	Season	Frequency		Duration	Penetration Depth
		In grass lawns	In desert landscaping		
Trees	Summer Spring and fall Winter	14-21 days 21-30 days 30-60 days	10-14 days 14-21 days 21-30 days	5-10 hrs. 5-10 hrs. 5-10 hrs.	3-5 ft.
Shrubs, hedges and vines	Summer Spring and fall Winter	7-14 days 10-20 days 20-30 days	5-10 days 10-14 days 14-21 days	1-2 hrs. 1-2 hrs. 1-2 hrs.	1½-2 ft.
Desert trees and shrubs	April-Nov.	20-30 days	10-20 days	3-5 hrs.	3 ft.
Cactus	May-Oct.	6-8 weeks, or when wilt is obvious		½-1 hour	10-15 in.
Vegetables	Summer Spring and fall Winter	2-5 days 5-10 days 7-14 days		½-¾ hour ½-1 hour ¼-½ hour	15-20 in.
Flowers	Summer Spring and fall Winter	2-5 days 5-10 days 7-14 days		¼-½ hour ¼-½ hour ¼-½ hour	12-15 in.
New Plantings	Season	Frequency		Duration	Penetration Depth
Seeds	Summer Spring and fall Winter	Often enough to keep surface moist		Long enough to wet 1-2 in. deep	3-5 in.
Transplants	Summer Spring and fall Winter	Often enough to minimize wilt		Long enough to reach root zone	Thoroughly moisten rooting zones

Chapter Events

Tucson

JANUARY 27. Jack Kaiser will lead a trip to Corral Nueva on the West side of the Atascosa Mountains in Western Santa Cruz County. This trip will afford an opportunity to see new and unusual plants, being guided by the world authority on the botany of Santa Cruz County. The road to Corral Nueva takes off from the Ruby-Nogales Road at a point about 2 miles NW of the turn off to Sycamore Canyon (It is also about 2 miles SE of Ruby on the same road.) We will meet and car-pool at Denney's, St. Mary's Road and I-10 at 8:00 a.m.

FEBRUARY (date to be determined). Stephanie Meyer is organizing a trip to Palm Canyon in the Kofa Mountains, jointly with the Yuma Chapter. This site is located about 53 miles north of Yuma, of which 44 miles is on paved US-95 and the last 9 miles are on a gravel road to the mouth of Palm Canyon. The latter is said to be well maintained. The trip is expected to extend over 3 days, starting from Tucson on a Friday and returning the following Sunday. Overnight camping is planned at the canyon on Saturday night.

APRIL. Plans are being made for a 4 day trip to the South rim of the Grand Canyon in mid or late APRIL. Plans are also underway for another Grand Canyon trip in either September or October, this time to the North rim. Those interested in either trip should get in touch with Meg Quinn at 624-7331H or 883-1380W or call Jane Evans at 624-7389H or 623-9485W.

Chapter meets on the second Wednesday of the month at 7:30 p.m. at the Tucson Botanical Garden.

Flagstaff

FEBRUARY 16. 'Propagation of Native Plants'. A workshop will be held at the Transition Zone Horticultural Institute to be led by Jeanette Milne. Learn a few secrets about growing wildflowers, trees and shrubs from seed. Meet at the Adult Center to carpool at 10 a.m.

MARCH 14. Vicki France, a local landscape architect will present a program on 'Landscape Design Using Native Plants'. Get tips from an expert on landscaping with our local flora. Program will be at the Adult Center at 7:30 p.m.

APRIL 17. Spring wildflower walk! Location and time to be announced.

Chapter meets on third Thursday of the month at Flagstaff Adult Center, 7:30 p.m. For information call Susan Husband 774-7924.

South Central

JANUARY 19. Field trip to Desert Botanical Garden to view progress of Native Flora Trail.

FEBRUARY 2. Plant Fair in cooperation with City of Casa Grande.

FEBRUARY 16. Field trip to Coke Ovens near Gila River, Pinal County.

Chapter meets the first Saturday of the month at 10:00 a.m. at the Central Arizona College. For more information contact Bill Kinnison 836-8562 or 836-8243.

Yuma

JANUARY 17. Joint meeting with ANPS and the Westerners. Westerners. Dinner meeting featuring speaker Tom Van Devender, research botanist at the Arizona Sonoran Desert Museum. Topic is "20,000 Years of Climate, Flora and Fauna Along the Colorado River. Dinner at 6:30 p.m. at Tom Tate's.

JANUARY 19. Sonoran Desert Critical Habitat near San Luis, AZ. Half day. Meet at Yuma Mesa Shopping Center.

Chapter meets on the second Monday, 7:30 p.m. at the Yuma Extension Service Office. For information call 783-8338.

Phoenix

JANUARY 25. The Nature Conservancy's role is presented in the film "Garden of Eden." A beautiful masterpiece. Limited seating, call Marc Mittleman, 265-0670, for reservations.

FEBRUARY 2. Field trip to Peralta Canyon Superstition Mts.

FEBRUARY 16. Field trip to Maricopa Mountains, wilderness study area.

MARCH 16. Field trip to Mountain States Wholesale Nursery. Ron Gass leads tour and teaches propagation.

APRIL 13, 14. PLANT FAIR! Marc Mittleman organizes this impressive annual event. Please let Marc know what you can do to help. Call him at 265-0670.

APRIL 27. Field trip to Boyce Thompson Arboretum.

MAY 11. Field trip to Camp Creek. Quickie trip of little known biological area, 30 miles north of Phoenix.

MAY 13. LeRoy Brady, is the principal landscape architect for Arizona Highways Dept. and state president of ANPS. He will present a program on water resources.

MAY 18. Field trip to West Fork of Oak Creek Canyon to see the spring wildflowers. By popular request.

Chapter meets the second Monday of the month at Desert Botanical Garden at 7:30 p.m. For more information about field trips contact Peg Gallagher 894-0994 or Marc Mittleman 265-0670.

AGAVE SYMPOSIUM

sponsored by the Desert Botanical Garden for the Arizona State University Centennial Celebration. March 7-9. Desert Botanical Garden.

1985

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October 23, 1984

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