NATIVE PLANT SOCIETY OF NEW MEXICO
NEWSLETTER

November/December 1995 Volume XX Number 6

Southwestern Soils:

Considerations for Native Plant Landscapes

by T. McKimmie

Rainfall in southwest deserts is always sparse but soil types may vary from one landscape to another. In New Mexico, for example, much of the population is centered around the Rio Grande, Pecos, Mimbres, or other river valleys. In these valleys soils may range from heavy clays to nearly pure sands or gravels, with gradations in between. Assumptions may be made, often incorrectly, about what conditions exist or what plants may grow under those conditions. For example, newcomers may assume that desert soils are sandy. Others may assume that native plants will not grow in the heavy clay soils that occur in some areas of our river valleys. As a consequence to the second assumption, the homeowner may choose to grow "exotics" and develop a landscape that appears out of place to the native plant enthusiast. The good news is that it is possible to grow native plants on any type of soil occurring in the southwest.

SOIL CONDITION AND FERTILITY

As goes the health of the soil, so follows the health of it's plants. Soil condition is perhaps the most important factor in the success of our plantings. Soils provide water, oxygen, nutrients, microorganisms, space for roots to explore, seed banks, and structural stability.

In the southwest practically all of our soils will benefit from the addition of organic matter. Organic materials provide nutrients, increase water retention (sandy soils), and improve drainage. Organic materials appear to improve soil condition regardless of the type of soil amended (eg., sandy, clay, etc.) generally improving soil workability. Composts are probably the best type of amendment. Animal manures may also be appropriate but beware of salts and be prepared to leach them out.

The use of mulches such as bark, grass or plant clippings, or other organic materials will help conserve moisture and make a cooler soil surface. The many benefits of mulches also include: protection of surface soil aggregates and reduced erosion; better rain infiltration and reduced runoff; improved surface aeration and action of microorganisms; reduction of weeds; reduced soil compaction, such as along foot paths. Compaction, by the way, is one of the leading causes of tree failure. Mulches also provide some nutrients as a result of their decomposition. Hay or straw is available from feed stores and chipped or shredded materials may be available at little or no cost from local tree pruning services. Stones may also provide effective mulches in some cases. Selection of mulching materials will depend on factors such as the space, desired appearance, and weathering characteristics. By the way, natural litter such as leaves, twigs, etc. should not be discarded but either left in place or used elsewhere as a mulch. While this may seem obvious, it is surprising how many homeowners go overboard on tidyness.

The purist may want to forego the addition of organic matter and leave the landscape in it's natural plant density and natural rainfall. This landscape will of necessity be more sparse than that desired by many homeowners. Those desiring more dense plantings and a more lush look will find organic amendments helpful. Water requirements will also increase proportionately.

cont'd. p. 2

Inside...

Calendar and Chapter Reports 4-5
Directory of Native Plant Societies 6
Pollinators 7
NM Plant Species Index 8

Southwestern Soils cont'd.

SOIL TEXTURE AND STRUCTURE: ACCEPT IT OR CHANGE IT?

Soil texture refers to the proportion of sand, silt, clay, and organic matter in a soil. Soil structure refers to the way these particles form larger units called aggregates. A good soil structure is crumbly and friable and drainage is neither too fast nor too slow.

If your landscape is in a natural state you may want to leave it that way. Be prepared, however, to accept a lower plant density than many urban landscapes enjoy. Many properties, however, have had extensive soil movement during construction excavation and may no longer have native "top soil" in place. In cases where the less fertile subsoils have been brought to the surface, amendment may be desirable. This usually involves bringing in soils from offsite.

Those with heavy clay soils may wish to amend at least part of their landscape in order to make the soil easier to work and to improve drainage. Heavy clay soils may be amended by addition of sand. Sand may be available locally, and sold by the yard. In some cases sand may be available in a local wash, although a permit may be necessary. A yard (3 feet square) of sand would be a fair load for a small pickup truck. A yard of river sand added to 100 square feet of a heavy clay soil and thoroughly mixed should improve soil structure and drainage.

While sandy soils could be amended with clays, there are probably better "solutions". First, you might count your blessings since you probably have a wider range of native plants to grow in sandy soils. Organic amendments will often improve both fertility and water holding capacity. It takes a lot of organic matter to make much difference in soil structure so it may be best to work on one area at a

The Newsletter is published six times per year by the Native Plant Society of New Mexico. The Society is composed of professional and amateur botanists and others with an interest in the flora of New Mexico.

Articles from the Newsletter may be reprinted if fully cited to author and attributed to the Newsletter.

Membership in the Native Plant Society of New Mexico is open to anyone supporting our goals. We are dedicated to promoting a greater appreciation of native plants and their environment, and to the preservation of endangered species. Members benefit from chapter meetings, field trips, publications, plant and seed exchanges, and educational forums. A wide selection of books is available at discount. The society has also produced two New Mexico wildflower posters by artist Niki Threlkeld. Contact our Poster Chair or Book Sales representative for more information. Call chapter contacts for further info.

We encourage the use of suitable native plants in landscaping to preserve the state's unique character and as a water conservation measure.

Advertising Schedule
Approved advertisements will cost $40 per year.

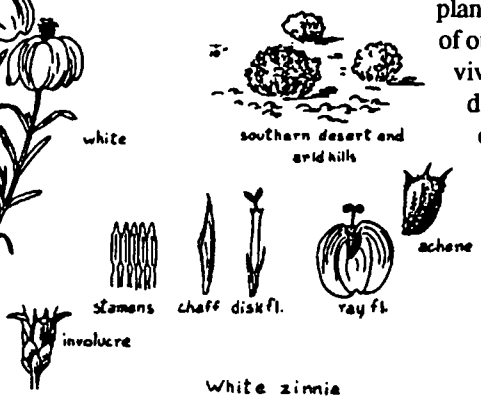
Schedule of Membership Fees
Dues are $10.00 annually for individuals or families. "Friends of the Society" include organizations, businesses, and individuals, whose dues of $25.00 or more provide support for long range goals. To join us, send your dues to Membership Secretary, 10800 Griffith Park Drive, Albuquerque, NM 87122

Newsletter Contributions
Please direct all contributions for the newsletter to Tim McKimmie, editor. See address below or email to tmckimmi@lib.nmsu.edu
Deadline for the next newsletter is Dec. 1.

Southwestern Soils cont'd.

time. Soil improvement may be a long term project or it may be a one time effort, for example, in transplanting.

The best strategy is to work with what you have. Major changes may not be necessary. In nature, many species can compete only on rocky slopes, or alkaline sites, or other sites of poor fertility and might disappear were we to change the soils on these sites. If we want to preserve such species in our landscapes we can either leave things in a more or less natural state or "pamper" the plants by reducing competion from weeds and other competitors. Remember, weeds are simply plants out of place, whether native or not. Some homeowners may want to have zones where more or less water, fertilizer, etc. are applied to develop somewhat differing habitats that harbor different plants. Here, small areas of the landscape may be amended with different purposes in mind.



PLANTINGS

Well what about the plants? The good news is that southwestern native plants are quite adaptable to a wide variety of soils. Our soil pH may make growing acid loving plants unrealistic, but our native plants are tolerant of our high pH soils. Scanning through native plant landscaping books you'll notice that many species will grow on several soils or that they prefer sand but will grow on other soils, etc.. One factor in common, however, is that nearly all require a well drained soil.

Sometimes finding suitable plants is simply a matter of trial and error. There is very little literature available that discusses the role of soil in landscaping with native plants. So in a sense, you are the researcher. Talk to others and see what experience they have. On your walks in the desert, pay close attention to what is growing where. Find areas that have types of soils similar to yours and see what's growing there. Plants adapted to local conditions of soil and climate will of course have an advantage over others. This accounts for the genetic differences that can occur in the same species of shrub, for example, that has been growing in the southern or northern part of its range.

Many plants will show increased vigor under improved soil conditions despite the fact that they are found under poorer conditions/ or sites in nature. The key factor at work here is "competition". In our landscapes we have essentially eliminated competition for our favored plantings. Otherwise many of our plants would not survive our created habitats due to natural selection or succession or competition. When we "weed" we are favoring selected plants.

Another factor to consider is transplanting. When we transplant from a pot with one type of soil into the ground with another type we can end up with a plant that is "rootbound" in place due to the differences in soil types. When transplanting break away some of the soil to roughen the edges of the root ball and provide better contact with the backfill soil. The bottom of the root ball can also be spread somewhat to increase surface area. Often potted plants have enjoyed an organic mix and plenty of fertilizer and water. So consider the soil type where you're placing a transplant. Since it's not feasible to dig up a plant every few years to add organic matter to the soil, the plant is limited very much by the soil type to begin with. To give a plant a healthy start and provide a transition zone from the potting soil to the landscape soil, you can dig a hole twice as deep and three times as wide and mix organic matter with the onsite soil. This will allow the plant to grow rather quickly while allowing some residual nutrients to remain in the soil for the following year. Eventually the plant will be left to the "local" nutrient bank and this may be beneficial in keeping our plants from becoming overgrown. If our shrub gets too much favoritism and special conditions, it may begin to get too big for our site, crowd desirable plants, and need trimming. Some plants may even look out of place such as the giant ocotillo in the frontyard. Be sure to water and tamp the soil to prevent settling. Do not plant too deep. If settling is expected, leave the plant a bit high.

While the condition of our soil may be the most important factor determining the health of our plants, other factors are at work as well. You should consider, for example, aspect or where the plant is located in relation to the sun's motion across the sky? How about shade, competition from nearby plants, proximity to dwellings, foot traffic, or animals. If you are fortunate enough to have a sloping landscape, you will be able to enjoy the benefits and pleasure of water harvesting. All of these factors and some trial and error and luck will interplay and determine the success of your plantings.

CALENDAR

OTERO

Nov. 4 Potluck, and annual business meeting. Plan 1996 schedule. Shirley Tresize' house. noon.

ALBUQUERQUE

Nov. 2 "City Plantings and Water Use" by Tom Ellis. 7:30 pm Albuquerque Garden Center, 10120 Lomas

Dec. 2 Christmas Potluck and Authors night. 6:30 Albuquerque Garden Center. Bill Dunmire will speak and he, and authors Ivey, Phillips, Lynn, Pilz, and Hodoba will autograph books.

LAS CRUCES

Nov. 8 Potluck. St James Church, Main and University, SE corner. 6:00 pm.

Dec. 6 Annual Planning meeting (for 1996). 7:30 Southwest Environmental Center, 1494 S. Solano

GILA

Nov. 17 "Name that Plant" program 7 pm. WNMU Harlan Hall.

Dec. 6 GNPS Board Meeting 7 pm.

Dec. 16 Holiday Pot luck.

TREE CONFERENCE

"Think Trees" is a two-day conference designed to enrich the expertise of people in tree care and related industries. The conference will be at the Albuquerque Convention Center Jan. 18-19, 1996.

Speakers are:
Sharon Lilly, Columbus, Ohio will lecture on arborist certification, tree structure, and tree pruning.
Donald Dahlsten, Center for Biological Control, UC Berkeley, will speak on using predators to control pests.
Gary Watson, Lisle, Ill., will lecture on how the natural patterns of root growth are determined by genetics, soil and competition, and on the delicate balance between the crown and root system and how to control those.
Gary Smith, Albuquerque, University of New Mexico Environmental Services, will speak on insect and disease problems.
John Mexal, professor at New Mexico State University involved in forestry research.
Judith Phillips, Veguita, owner of an arid-land nursery and author of desert gardening books.

Think trees was started in 1986 with about 100 tree service people in attendance. The program has grown to an attendance of about 400 from all over the state and from neighboring states as well. Speakers with international reputations have lectured here.
The sessions also provide education credits for commercial pesticide applicators. These are required for applicators to maintain their licenses.
Cost of the conference is $90. For registration information, send a self-addressed stamped envelope to Think Trees, c/o Cooperative Extension Service, 1510 Menaul NW, Albuquerque, NM 87107.

Many thanks to Robert Dewitt Ivey for permission to use his wonderful drawings from *Flowering Plants of New Mexico*, second edition, in our *Newsletter*.

CHAPTER REPORTS

Las Cruces-Paul & Betty Shelford

At our August 9th meeting, we had a discussion of environmental issues. Of particular interest was an article on Easter Island by Jared Diamond, brought by Alice Anderson. The article described the extinction of the natives of that island after they had used up all the trees for the transportation and erection of the giant statues. Without trees, the tropical rains washed most of the vegetation into the sea. The animals died, the birds died, and the people died.

On August 13th, there was a field trip on the White Sands Missile Range arranged by Jennifer Atchley. Dave Anderson, staff biologist for the Range, led a group of ten members up into several canyons in the San Andres Mountains. They examined the salt-tolerant plants among the gypsum crystals near Lake Lucero. They were shown a colony of pin cushion cactus indigenous to the missile range. Throughout this trip into the otherwise restricted missile range they saw many of the exotic oryx which have adapted very well to this environment.

The meeting of September 13th featured Kelly Allred, Professor of Agronomy at NMSU. In 1993, Dr. Allred retraced the famous 1904 trip of NMSU Professor E. O. Wooton who traveled more than 1200 miles up through western New Mexico to Durango, Colorado and back down through central New Mexico. Professor Wooten collected and pressed more than 500 plant species and well over 1500 specimens, many of which are still located in the NMSU Herbarium. Wooton's journal of that trip deplored the erosion of the range lands due to the overgrazing practices of the open range. He stated that if the lands were leased to individual ranchers and fenced in as their responsibility, then much of the misuse would cease. As Dr. Allred followed the journal and surveyed the same range lands, he found that Wooton was right. Regardless of the misuse by some ranchers today, the condition of the lands are greatly improved from their open range conditions at the turn of the century.

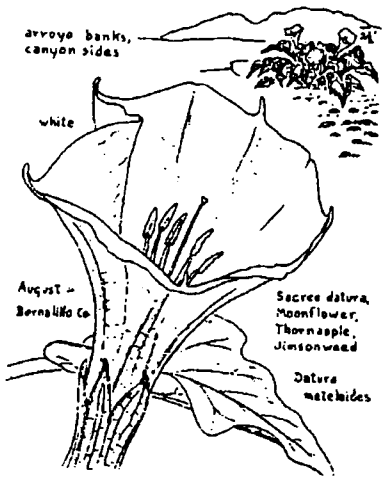
On September 17th, Greg McGee led five other members on a field trip to Emory Pass in the Gila Wilderness. They hiked north along the Crest Trail and saw many wildflowers, including Indian Pinks, Indian Paintbrush, Southwestern Penstemon, Pine-needle Penstemon, Sweet Four O'Clock, Ribbon Four O'Clock, Geranium, Skyrocket, Yarrow, Locoweed, Purple Aster, and Catchfly. In addition to Douglas Fir and Ponderosa Pine trees, they also saw Silverleaf Oak and Snowberry trees.

Otero-Jean Dodd

Otero had to postpone its trip to Chupadera Mesa a week because of continuous,wonderful,gentle rainfall the planned weekend. So on the 23rd of September we went to the turnoff to Gran Quivera and started to explore the many many roadside flowers. Main colors were yellow to gold mixed with purple,mainly from the asters. Some of the composites were False Bonset, *Gaillardia pulchella*, Horsebrush, Blackfoot Daisy,Gumweed, Zinnias, Greenthread,*Artemesia frigida*, and several of the different groundsels. Buckwheats in the fall are always beautiful to see. Lots of the mustard spectacle pod which we are used to seeing in the spring. Some of them were quite short which seemed unusual.An unplanned stop at Gran Quivera for lunch reminded us of what a beautiful place it is. If you have never been there, it makes a nice trip. There is a selfguided tour around the remains of the historic structures,a film tells you the history of the area, and there is nice bookstore On the drive through the Chupadera Mesa, the most often heard comment was about the beauty of the scenery. The mallows were in bloom following the rain. One bush was covered with pink flowers from top to bottom.

Albuquerque - Lu Bennett

At our September 7th meeting, Dr. Richard Lee was called away suddenly so Karen Lightfoot stepped in to show his slides and lecture on the weeds that can be declared noxious in New Mexico.



At our October 5th meeting, Carroll Curb presented beautiful slides of wildflowers of New Mexico and Texas. Susan Horner reported that the plant sale in August grossed around $5000 and netted the chapter over $1200. The chapter shared a booth at the State Fair with the Xeriscape Council and the reaction was very positive from the public. Thanks are extended to Virginia Burris, Bev Grady, Paul Shaw and Jean Heflin for helping with the planting of native plants at the Petroglyph National Monument. Members are invited to participate in the November 9th planning meeting to be held at Jean Heflin's home.

Native Plant Societies
of the United States

Alabama Wildflower Society
Route 2, Box 115. Northport, AL 35476

Alaska Native Plant Society
PO. Box 14163. Anchorage. AK 99514

Arizona Native Plant Society
POB 41206 Sun Station Tucson. AZ 85717

Arkansas Native Plant Society
Route 1. Box 282 Mena. AR 71953

California Native Plant Society
1722 JadeStreet #17 Sacramento, CA95814

Colorado Native Plant Society
Box 200, Fort Collins. CO 80522

Botanical Society of Washington
Department of Biology—NHB/166
Smithsonian Inst., Washington, DC 20560

El Paso Native Plant Society
7760 Maya Ave. El Paso, TX 79912

Florida Native Plant Society
PO Box 680008. Orlando, FL 32868

Georgia Botanical Society
1676 Andover Court Doraville, GA 30360

Idaho Native Plant Society
USDA—Forest Service, I. F. & R. E.S.,
316 East Myrtle Street Boise, ID 83706

Illinois Native Plant Society
Forest Glen Reserve. RR #1. Box 495A
Westville, IL 61883

Indiana Native Plant Society
6106 Kingsley Dr. Indianapolis, IN 46220

Kansas Wildflower Society
Mulvane Art Center. Washburn University
17th & Jewell Street, Topeka, KA 66621

Louisiana Native Plant Society
Route 1. Box 151. Salie. LA 71070

Josselyn Botanical Society
Deering Hall. University of Maine,
Orono, ME 04469

Maryland Native Plant Society
14720 Claude Ln, Silver Spring, MD 20904

New England Wild Flower Society, Inc.
Garden in the Woods. 180 Hemenway Road
Framingham. MA 01701

Michigan Botanical Club
c/o Herbarium, North University Building
Univ. of Mich., Ann Arbor, MI 48109-1057

Wildflower Association of Michigan
6011 W. St Joseph. Suite 403
PO. Box 80527. Lansing, MI 48908-0527

Minnesota Native Plant Society
220 BioSci Center, University of Minnesota
1445 Gorter Avenue, St. Paul, MN 55108

Mississippi Native Plant Society
202 N. Andrews Ave. Cleveland, MS 38732

Missouri Native Plant Society
Box 20073 St. Louis, MO 63144-0073

Northern Nevada Native Plant Society
Box 8965, Reno, NV 89507

Mojave Native Plant Society
8180 Placid Dr.
Las Vegas, NV 89123

New Jersey Native Plant Society
c/o Frelinghuysen Arboretum
Box 1295R, Morristown, NJ 07960

Native Plant Society of New Mexico
PO. Box 5917, Santa Fe. NM 87502

Niagara Frontier Botanical Society
Buffalo Museum of Science. 1020
Humboldt Parkway. Buffalo NY 14211

New York Flora Association
New York State Museum
3132 CEC. Albany. NY 12230

North Carolina Wildflower Preservation Society
c/o N. C. Botanical Garden UNC-CH
Totten Cemer 457-A Chapel Hill, NC27514

Ohio Native Plant Society
6 Louise Drive, Chagrin Falls, OH 44022

Oklahoma Native Plant Society
2435 S. Peoria Tulsa OK 74114

Native Plant Society of Oregon
POB 902 Eugene,OR 97440

Pennsylvania Native Plant Society
1806 Commonwealth Building
316 Fourth Avenue. Pittsburgh. PA 15222

Southern Appalachian Botanical Society
c/o Charles Horn, Newberry College
2100 College St. Newberry, SC 29108

Tennessee Native Plant Society
c/o Department of Botany U. of Tennessee.
Knoxville. TN 37916

Native Plant Society of Texas
PO. Box 891. Georgetown. TX 78627

Utah Native Plant Society POB 520041
Salt Lake City, UT 84152

Virginia Native Plant Society
PO. Box 844. Annandale. VA 22003

Washington Native Plant Society
2214 Camas Ave.
Richland, WA 99352

Wild Ones - Natural Landscapers
625 Orchard, West Bend. WI 53095

West Virginia Native Plant Society
PO. Box 2755, Elkins, WV 26241

Wyoming Native Plant Society
1604 Grand Ave. Laramie WY 82070

<u>Other Societies</u>

American Penstemon Society
1569 South Holland Court
Lakewood, CO 80226

Canadian Wildflower Society
4981 HWY7 East, Unit 12A #228
Markham, ONT. Canada L3R 1N1

Chihuahuan Desert Reserarch Institute
POB 1334 Alpine TX 79831

National Wildflower Research Center
4801 LaCrosse Ave
Austin, TX 78739

National Council of State Garden Clubs
POB 860 Pocasset, MA 02559

Eastern Native Plant Alliance
P.O. Box 6101. McLean, VA 22106

A Mutual Attraction

by Jonathan Hanson
reprinted from *Desert Skies*, Fall 1995

The yucca flower waits in the darkness of a warm May night, its waxy, creamy-white petals unfolded, one of several hundred such blooms filling the stalk that rises sixfeet above the parent plant. Within the flower the stigma— the opening to the ovary and its repository of ovules, the unfertilized seeds—protrudes above the stamens, delicate filaments capped with sticky heads of pollen, the sperm of the plant.

Suddenly a small white moth lands on one of the petals. Deliberately she clambers into the interior of the flower and, using a pair of highly specialized appendages, gathers pollen from the stamens, rolling it into a tight ball which she holds under her head. The moth then clambers out of the flower and departs.

Still the flower waits patiently. Soon another moth alights—but this one is already carrying a ball of pollen, gathered from flowers on other yuccas. This moth ignores the stamens; instead she crawls to the stigma, tears off part of her ball of pollen and carefully stuffs it into the narrow slits that head the passage to the ovary. Readjusting her position, she uses the pointed ovipositor on the tip of her abdomen to pierce the base of the ovary and deposit one of her own ferrtilized eggs among the ovules. Mission complete, she climbs out and flies away, leaving her developing egg—and a pollinated flower.

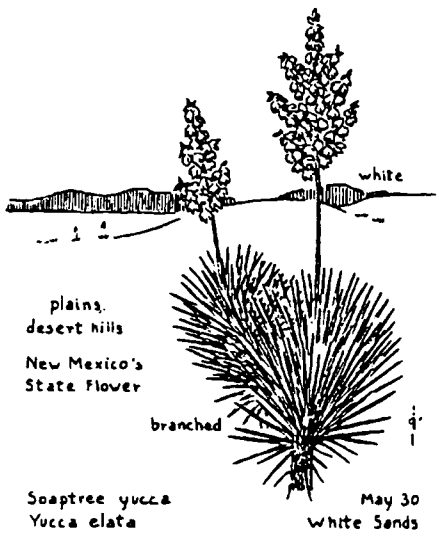
The yucca (*Yucca elata* and other species) and yucca moths of the genus *Tegeticula* illustrate a classic example of mutualism, a symbiotic relabonship between two species from which both participants benefit. The pollen deposited by the moth fertilizes the seeds of the yucca, and they begin developing within the ovary—the fruit—of the plant. Meanwhile the moth's egg hatches and the larva begins boring its way through the fruit, eating the seeds. But not all of them. Enough are left to ensure descendents for the yucca.

Mutualism is an ancient and vital strategy for most plants. A flowering plant that offers nectar as food for insects or birds is repaid when its pollen sticks to the heads or bills of the animal and pollinates another flower of its species, or when other pollen is deposited in its own ovary (this exchange between plants is called cross-pollination; it ensures a healthy mix of genes). What is unusual about the yucca/yucca moth relationship is that it requires deliberate action on the part of the moth—in fact, the yucca cannot be accidentally pollinated by bees or birds because of the configuration of the flower.

White flowers, such as those borne by the yucca, are often a trait of plants whose pollination is carried out at night by moths or nectar-feeding bats (white is more visible at night than colors). The timing of these blooms offers another clue. For example, the flowers of cardon and organ pipe cactuses open after dusk and close soon after sunrise; their pollination is carried out almost exclusively by bats. Saguaro flowers are white as well and open after dark—but they stay open through the next aftemoon. Researchers have determined that saguaros are pollinated by both bats, at night, and by birds, mostly doves, during daylight hours.

Many species of agave are adapted to bat pollination. Certain bats, such as the lesser long-nosed (*Leptonicteris curasoac*) are physiologically adapted to feed on nectar, pollen and ripe fruit rather than insects. These bats migrate north from Mexico in the spring, following the blooming cycle of columnar cactuses into Arizona. In late summer and early fall they return south, feeding on agave blooms. One such agave, the maguey (*Agave palmeri*), is found throughout Pima County between 3,000 and 8,000 feet in elevation. The magueys in our area have white flowers that open at night. However, north of the Catalina Mountains, beyond the migration range of the nectar-feeding bats, is another species, *Agave chrysantha*, which is indistinguishable from *A. palmeri*— except that its flowers are bright orange-yellow, bloom during the day, and are pollinated by hummingbirds.

Another, much harder to find, night bloomer is the Sonoran queen-of-the-night (*Peniocereus striatus*), a nightblooming cereus of the west deserts. The multiple stems of the queen-of-the-night are less than half an inch thick, and the cactus grows to only a couple of feet tall under desert plants such as ironwood and creosote. *Peniocereus* only blooms for a few nights each summer during the rainy season, and it is pollinated by moths such as the hawkmoth. The floral tubes of the blossom are exactly the right length for the long, nectarsipping proboscides of the moths, and the anthers are positioned to thoroughly coat the foraging insect with pollen. When one sees a field of thousands of blooming llowers on a spring morning, it's easy to forget that all those flowers are fiercely competing to attract bees or other pollinators, to ensure their own fertilization. By evolving to attract noctumal flyers, plants like the cardon and agave were able to exploit a new niche—and, of course, since the moths and bats had to evolve at the same time, they were exploiting new niches as well, reducing competition and increasing the diversity of life.



Unfortunately, there is a growing threat to this ancient relationship. Insecticide spraying of agricultural fields and rabies control programs in Mexico, where many of the important pollinators for Sonoran Desert succulents spend a great deal of their life cycles, have seriously affected the reproductive rates of those succulents. Researchers Steve Buchmann and Gary Nabhan found in a national park along the U.S./Mexico border that insecticide spraying across from the park reduced sphingid moth numbers enough in one season that the subsequent cactus fruit set was alarmingly low. They have termed the process "chemically-induced habitat fragmentation" and have found that several succulent species are suffering low rates of reproduction due to pollinator elimination. Scientists working in the Sierra Madre feared that a rabies outbreak in 1994 might spell disaster for nectar-feeding bats that winter in Mexico; often, whole bat colonies, regardless of their ability to carry the rabies virus, are exterminated. In the U.S. the lesser long-nosed bat, formerly called Sanborne's, is already listed as an endangered species. Its mutually evolved food plants may one day follow the lesser long-nosed into oblivion. Look for a campaign soon, led by Buchmann, Nabhan, and Paul Mirocha, on "The Forgotten Pollinators."

A Working Index of New Mexico Vascular Plant Names

The "Working Index of New Mexico Vascular Plant Names" is a preliminary, up-datable report of all names reported for the New Mexico flora. It contains, in both classificatory and index format, the names of the 3906 total taxa currently known for New Mexico, including 148 families, 922 genera, 3433 species, and all pertinent synonyms. Its 246 pages also include more than 300 references verifying the more than 1000 corrections to the flora since the most recent account of 1981. Cost: $5.00

Order Form for the Working Index

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Kelly Allred
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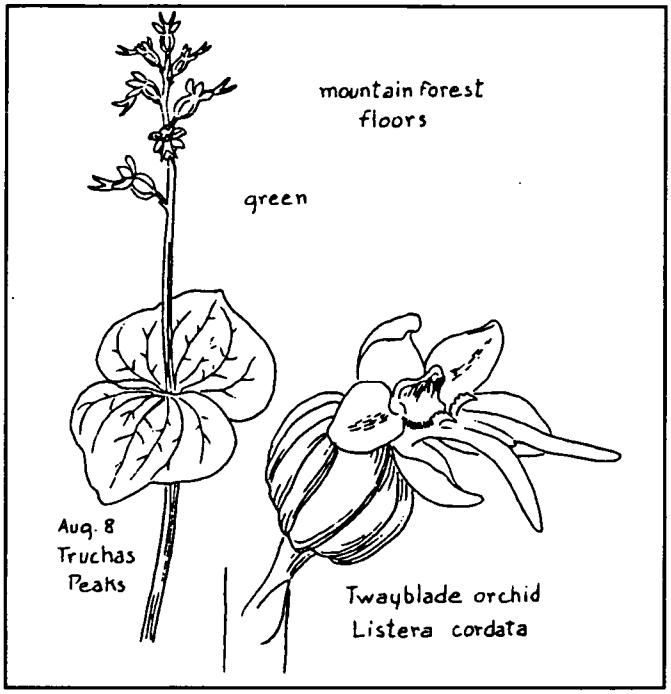
Las Cruces, NM 88003



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