Native Plant Society of New Mexico

NATIVE PLANT SOCIETY OF NEW MEXICO NEWSLETTER

September/October 1995 Volume XX Number 5

NATIVE PLANTS AND SPACE

by Wade C. Sherbrooke, Southwestern Research Station, American Museum of Natural History, Portal AZ.
reprinted from the *Plant Press* 17(3):9, Summer, 1993

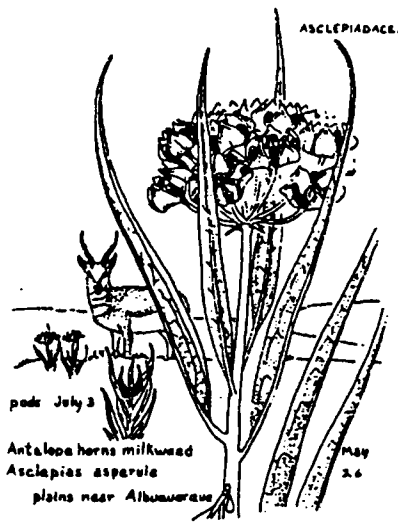
Every plant's roots penetrate soil and suck up the nutritive broth of the earth's mantle, where the remains of past geologic events mix with microscopic components of the experiment of life. Each rootlet weathers an environment as significant to the entire plant as are light, temperature, humidity, herbivores and pollinators to the vegetative and reproductive portions. Above ground and below ground, all these factors are unique components of a particular place that molds an individual plant.

Plants do not move far in a lifetime. They seem locked into a piece of geography, and indeed are parts of the landscape. The bonds holding them to earth are only briefly broken during flights of reproductive creativity, through pollination or seed dispersal. Otherwise their lives have been sculpted by the climatological, geomorphological, and biological realities of a particular place on planet earth.

Do native plants have different relations to their environments than non-natives? Do native plants offer us something that cannot be attained through non-native plants?

Native plants and non-native plants have different ecological relations and histories in terms of place on Earth. Native plants can serve us well if we are trying to establish an understanding of place for ourselves. Non-native plants are linked to accelerating cultural changes that began before the origins of agriculture. Non-native plants are products of disassociations of species from places to which they evolved.

Today, native species are where they evolved. Because of this they help to define the highly detailed landscapes of the natural world. By learning about the intricacies of the lives of native plants in a geographical area we build stores of knowledge about that piece of the globe. Familiarity is established, along with the feelings that result from it. Native plants are neighbors for those of us mentally and emotionally connected to our living environs. We meet them on morning walks, follow them through the seasons, watch their children grow, and record their deaths and decay. Native plants offer uncluttered connections to a sense of place in the biosphere.



Non-natives can connect us to diverse places and the unending, at least for each individual human brain, array of evolutionary possibilities that exist amongst plants. They stretch our minds to other places and a different set of events. But these transplants offer little to our understanding of the continuity and integrity of our biotic neighborhoods.

As our minds assimilate portions of the native and non-native vegetative world our viewpoints are molded by the nature of the dichotomy of these perspectives. By focusing on native plants we march a path towards greater identity with place. Willful contemplation of native plants can be a commitment to expand ones mind in the direction of familiarity with place and the intricacies of evolutionary process within the confines of a particular ecological system. Unconsciously surrounding oneself with non-natives blurs any biological interpretation of place and clouds one's view of an ecosystem evolved in situ. If mankind continues to value a sense of place, then mankind should value the significance of native plants.

Inside...

Report on Endangered Plants

The Santa Fe Reporter recently ran an article detailing the role of two of our members in protecting the state's native plant species. Bob Sivinski and Karen Lightfoot are responsible for the state's Endangered Plant Program, now in its eleventh year.

Only a few states can claim more species than the approximately 3,000 species native to New Mexico. Bob and Karen spend part of their time studying plant populations in the field. They also are involved in the listing of plants as threatened or endangered species and the development and implementation of recovery plans.

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 Oct. 1.

Report from the Board

The Board of Directors met at the Annual meeting in Silver City to conduct the business meeting for the society. Some of the items discussed were:

1. The 1996 meeting with the Texas NPS in El Paso.
2. The 1997 meeting. Perhaps in an "out of the way" place. Maybe in Alamogordo. If you have any suggestions call a board member.
3. The newsletter. It is editorial policy not to accept articles submitted to other sources except as reprints.
4. A committee was appointed to discuss the develoopment of the NPSNM slide collection..

Xeriscape Conference

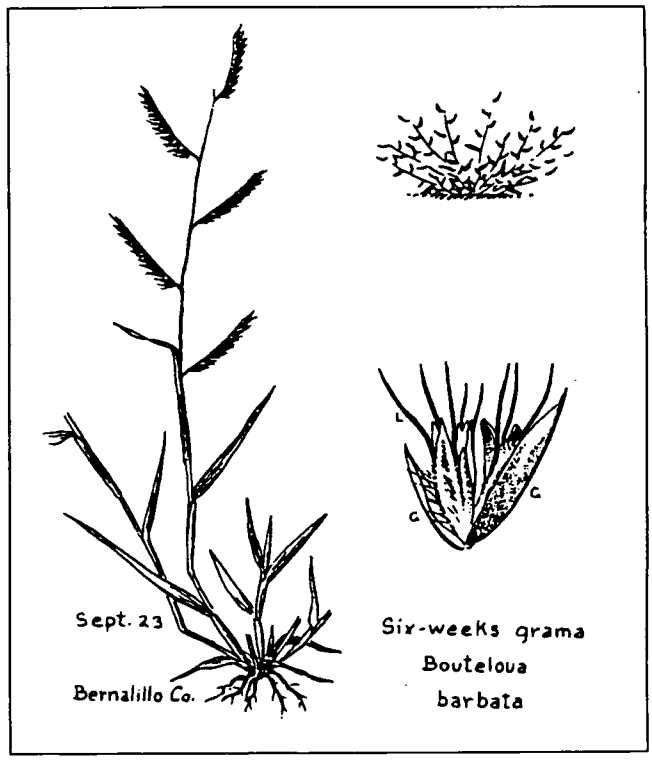
The Xeriscape Council of New Mexico will hold a conference Oct. 20-21, 1995 at the Indian Pueblo Cultural Center in Albuquerque. The conference will include workshops, field trips, and lectures. For information contact Virginia Cramer, 856-6706.

Schoolyard Wildlife Habitat

The New Mexico Dept. of Game and Fish is sponsoring a program for grades K - 12 to establish wildlife habitats at or near schools. The habitats will consist primarilty of native plants. It may be as simple as a wildflower garden or may be more extensive.

The department is awarding grants up to $300 for establishment of such habitats.

For further information contact:
NM Dept. of Game and Fish
Conservation Education Section
POB 25112
Santa Fe, NM 87504



OSHA (*Ligusticum porteri*)

Osha is rather a stout plant reaching a height of three feet. It grows in moist fertile soil almost to timber line and is a palatable forage plant. It is known as Angelica by the early Sacramento Mountains residents and as chuchupate by the Mexicans. In northern New Mexico it is called osha by the Spanish speaking people and by the Indians. It is prized highly for its medicinal qualities. The roots, prepared in various ways are used to treat disorders such as colds, flu, rheumatism, cuts, upset stomach, indigestion and snakebite. The osha is a wonder plant to the curanderos and especially to the sheepherders who consider it a medicine kit in itself. They chew the dry roots for headaches, tooth ache and indigestion and make it into a tea to treat a cold. They drink it to prevent hangovers and believe that its very presence keeps snakes away.

A pungent odor is given off by the plant which is somewhat similar to its relative celery and it is used like celery for seasoning soups and other dishes. The dry hollow stems were smoked like cigarettes by the Apache and later by the Spanish speaking people. The roots are also chewed in an effort to break the tobacco habit.

Osha is a member of the parsley family which contains many useful plants which include carrots, parsley, celery, dill and anise. Osha may be confused with the water hemlock and the poison hemlock which are among our most poisonous plants. Growing in the wild they look much alike so extreme caution should be used by those who may confuse these plants.

WILD PLANTS SHOULD BE LEFT ALONE UNLESS ONE IS ABSOLUTELY SURE!

By Ruby Buckner

CALENDAR

OTERO

Otero Chapter will not participate in the Cottonwood Festival (Sept. 2-4) this year.

Sept. 16 Field trip to Chupadera Mesa. 434-3041

Oct. 14 Dog Canyon. Oliver Lee State Park at 9 am. or hike down from rim with John Stockert (585-2546).

Nov. 4 Potluck, noon at Shirley Trezise' home

ALBUQUERQUE

Sept. 7 "Noxious Weeds" by Richard Lee. 7:30 Albuquerque Garden Center, 10120 Lomas.

Oct. 5 "Desert Ecology" 7:30 Albuquerque Garden Center.

Nov. 2 "City Plantings and Water Use" by Tom Ellis of Parks Management. 7:30 Albuquerque Garden Center.

LAS CRUCES

Sept. 9 (Sat.) Highway trash cleanup. 8 am, Main st. 4 mi. south of University Ave, or St. James Church, on Main.

Sept. 13 "On the Trail with E.O. Wooten" by Kelly Allred. 7:30 Southwest Environmental Center, 1494 S. Solano

Sept. 17 Fieldtrip to Emory Pass, 7:30 am Pan Am Center

Oct. 11 "Ecological Effects of Invasive Plant Species" by Laura Huenneke. 7:30 SW Environmental Center

Oct. 15 Field trip up Rabbit Ears "canyon". 8 am Pan Am lot

SANTA FE

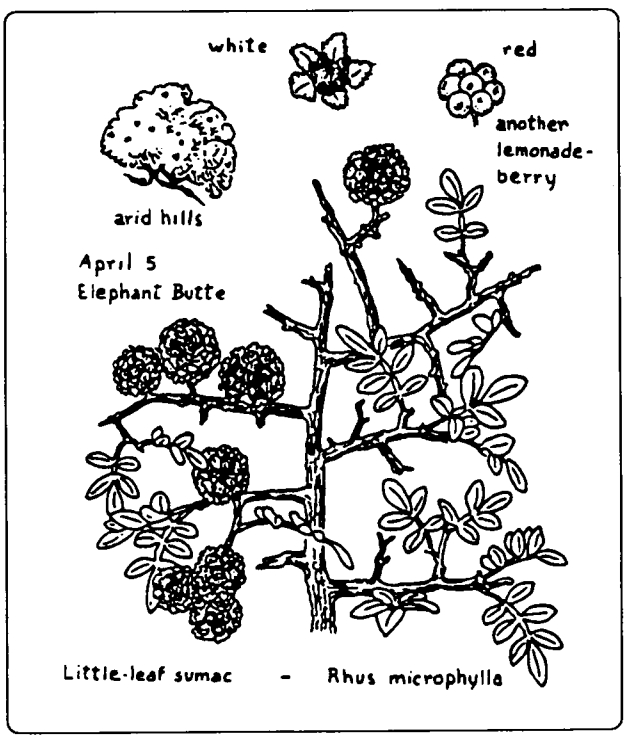
Sept. 9 Field trip to Tesuque river. 8 am PERA lot.

Oct. 7 Field trip to Trail Canyon. 8 am PERA lot.

GILA

Sept. 17 Field trip to Willow Creek, Gillata Creek. 8 am., WNMU Fine Arts Bldg. South lot.

Oct. 1 McKnight Mtn. Field trip. 8 am. WNMU Fine Arts lot.



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

Albuquerque - Lu Bennett

At our June meeting, Judy Dain gave a presentation with outstanding photography of wildflowers in the East Manzano Mountains. The Dain Ranch is on Lovato Road and has 130 acres and the residence on one side of the road and another 100 acres on the other side. In the area are Alligator Junipers which survived the logging of the 1880s as well as large Gambel Oaks and Rocky Mountain Junipers.

Judy presented her slides of wildflowers in order of blooming . First blooming are Lousewort, Tansy Aster, Bladderpod, Sidebell Penstemon, green Pitaya Cactus, Perky Sue, Indian Paintbrush and Fendlerbush. Next in bloom are Salsify, Lupine, Flax, Verbena, James' Penstemon, Plains Larkspur and Mammillaria Cactus. Navajo Tea blooms in July and August. Also blooming in July and August are Whipple's Penstemon or Dusky Penstemon, Coneflower, Germander, Pagoda Plant, Sky Rocket Gilia, Hopi Tea, Scarlet Penstemon, Purple Geranium, Four O'Clocks, Spike Verbena, Purple Clover, Pink Oxalis and the more common Aster and Globe Mallow. Wallflower blooms in July and August in the area. It is the same species that has yellow blooms in the Sandia Mountains, but it has orange blooms in the Manzanos due to the difference in soils. Fall in the East Manzanos brings out the beautiful colors of Chamisa, Fringed Sage, Winterfat, Red Stemmed Buckwheat, Hog Potato, Sunflower, Virginia Creeper, Currant and the spectacular red of Three Leaf Sumac.

On Saturday following the presentation there was a field trip and potluck at the Dain Ranch.

CHAPTER REPORTS

Las Cruces-Paul & Betty Shelford

At our June 14th meeting, Dr. Richard Worthington, Biology Professor at the University of Texas at El Paso, spoke on Plants of the Organ Mountains. Dr. Worthington is engaged in long-term research to determine the diversity of plants in the twenty different mountain ranges accessible from El Paso, from the Guadalupe Mountains of New Mexico to the Davis Mountains in Texas. This requires intense field work in all seasons at all altitudes. A special agreement with Ft. Bliss also allows him occasional access to the military reservation sections of the Organ and Franklin Mountains; for those who question it, he mentioned that there is unexploded ordinance all over the Rattlesnake Ridge area. We are prohibited from those areas for good reason. In addition to the many wildflowers, cacti, trees and other plants we know in the Organ Mountains, he has identified 111 species of lichen and 120 different mosses. Although they are usually rare, he also found many liverworts just below Organ Peak. He has even climbed the Needles section of the Organs in search of lichens and liverworts. He has identified 133 composites among the wildflowers of the Organ Mountains. The scope and depth of this research is most impressive, as should be the resultant publication of it.

On June 18th, Lisa Mandelkern led a field trip on a two-mile section of the Rim Trail near Alamo Peak between Alamogordo and Cloudcroft in the Sacramento Mountains. They first observed Chicory and Red Penstemon beside the road. On the trail, the ten members observed Salsify, Vetch, Red Columbine, Indian Paintbrush, Lupine, small single pink roses which may have been Woods Rose, New Mexico Locust, Strawberries, Mountain Ninebark, Cranesbill, White Violets, Cinquefoil, Solomon's Seal, Gromwell, Dandelion, Figwort, Bindweed, and Mountain Bluebells.

At our July 12th meeting, Paul Hyder, a Ph.D. candidate at NMSU, and co-author of the recently published field guide Snakes, Lizards, Turtles, Frogs, Toads & Salamanders of New Mexico, gave an interesting talk, illustrated with slides, on the various snakes found in southern New Mexico.

Otero-Jean Dodd

June 16,17,18 Otero took a trip to Heron Lake near Chama and Tierra Amarilla. The lake has a no-wake policy so you can enjoy the beauty of your surroundings in peace and quiet admiring the canoes, sail boats, and pontoon boats. Plants at the campsite were typical of those in the Park. Puccoon with its yellow flowers, little penstemon linarioides with its many blue-violet blossoms, Lance fruit astragalis with cream colored flowers tinged with yellow and fruit that turns red. On Saturday Park Ranger Tommy Martinez and State Forester Kim Paul took us on a morning tour of some of the Park. We were furnished with information about the birds, fish,reptiles, and mammals in the Park as well as some of the trees and shrubs. A large subject is the source of water for the lakes which comes from the western slope of the SanJuan Mountains of Colorado through a network of dams, siphons, and tunnels. A tour of Willow Creek campgrounds,which has been renovated, took us on a nature trail which provided a new look at the lake at every turn. Red flowers of the Indian Paintbrush are the most widely distributed wildflower in the Park. The Blanco area will be a new campground in about 3 months. The Park, like many parks, is rapidly becoming overcrowded. These 2 new campgrounds should help. Employees live at the Park and appear to be on call a lot. There is a boat on patrol in case of emergencies and the employees need to be plumbers,electricians,naturalists, etc. to take care of whatever is needed. They obviously like what they are doing. One of the interesting plants to us from the southern part of the state was the *Yucca glauca* we started seeing after SantaFe. These are extremely small to 3'. See Ivey p. 340. We are used to seeing the very tall *Yucca elata*.

On 7-15-95 Otero Chapter members followed Rails to Trails guides out of Cloudcroft onto the Trestle Trail with Botanist Lisa Johnston from Artesia. She identified plants along the trail and took home samples from the unknown ones to identify. The result will be a list of plants to be found around the stake sites along the trail. Numbered stakes were installed to place the plants identified on the trail. The trail is beautiful indeed. If you would like to try it out, go to Cloudcroft and follow the sign to the Depot to begin your hike. The trestle is the one you see from Hwy. 82.

Rails to Trails is a national movement to use old railroad beds for hiking trails. Problems in making the trails useable include cleaning out brush to form a path, and private property and high-ways that now block the original railroad right of way. The local Rails to Trails group has a $5,000 grant to develop a brochure to include photos, drawings, maps, sketches, to cover history, culture, fauna along with the flora, trail etiquette, etc. They need a matching $5,000 worth of volunteer help to obtain the grant. Otero will do a plant inventory and stakes along the Grand View Trail and others as they are developed. It is hoped the trail will go from Cloudcroft to Alamogoro and later to include spurs that were in the original system.

What good food at Jim & Betty Claypools near Bent on 7-29-95 for the edible native potluck! For those of you who knew Bill Mayfield, Claypools bought his house and are gradually changing it and the grounds to make it their own. The berms are still there between the hwy 82 and the house to cut highway noise and dust. By now they are covered with good size trees,shrubs,and under-growth. Some of the native food consisted of watercress soup, watercress sandwiches on bread made with dried mesquite beans, corn,and wheat; tiny pine nut muffins,purslane salad,cactus fritters, mesquite and prickly pear jam, wild onion chicken and dressing, pinon nut cookies, nopalitos served with rice,tea made from blackberry leaves and mint from Betty's yard, watermelon, chili casserole, and beans.

Otero took a field trip to Osha Trail across from the trestle on HWY. 82 on the way to Cloudcroft 8-5-95. Nearly every plant we saw was in DeWitt Ivey's book "The Flowering Plants of New Mexico". Oaks were Gambel, Gray, and Waveyleaf. Maples were Big Tooth and Mountain maple. Other trees were N.M. Locust, old growth aspen, fragrant ash (*Fraxinus cuspidata*), and pines. Grasses were slender Wheat Grass,sleepy grass, orchard grass, and blue grass. Mountain mahogany have started putting out their tails to catch the light. The impressive *Delphinium tenuisectum* was there with its very large clump of leaves and towering flower stalks.

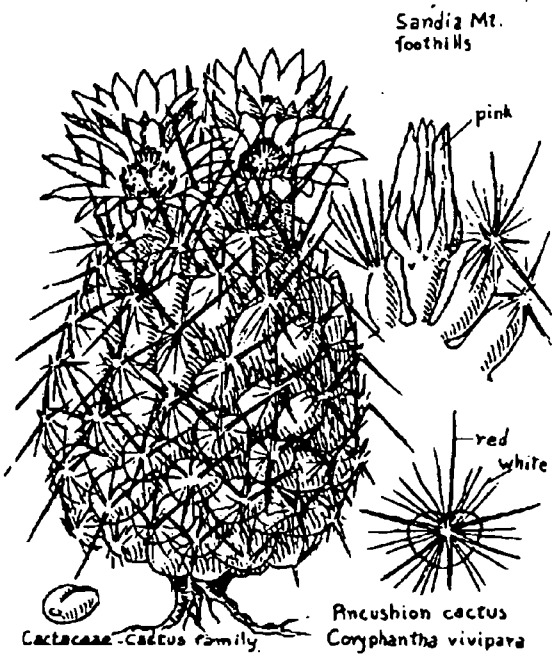
The trail itself is steep at the beginning although if you stop to look at the plants,it provides a respite. Much of the trail is apt to give the feeling of being closed in compared to the grand vistas to which we have become accustomed. We saw lots of Osha. See article by Ruby Buckner (pg. 3).

Germinating Cacti Seeds

reprinted from *Native Plant Society of Texas News.* 7(4):3, July/ August 1989
by F. G. (Breck) Breckenridge

Germinating seeds of cacti requires warmth, moisture and the proper soil mixture. I have found that almost all cacti, both arid and moist-loving representatives, respond collectively to the following method:

Soil Mixture: 2 parts coarse sand, 2 parts Baccto potting soil (or its friable, peat-based equivalent), and 1 part sterile, composted sheep manure, although other sources are acceptable.

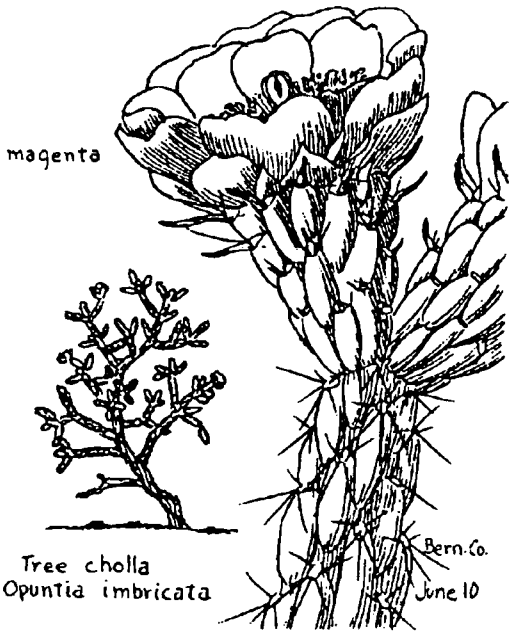


Sowing: Find or build a container which is 3 to 5 inches deep. Clay pots, deep saucers with holes or wooden frames—known as ' flats"—are equally suitable. Use crock for drainage as usual—that is, put broken pieces of pots over the water outlet—and then add the soil mixture to within about one inch of the top. Smooth the soil surface. Then, sprinkle your seeds evenly over the soil. Next, cover the seeds lightly with a little more soil. Finally, lay down a fine, quarterinch layer of coarse sand. Tamp down gently, yet firmly.

Culture: Wet down the seed bed with a light spray from above or via osmosis from below. Place container in plastic bag or cover flat with glass to insure high humidity. Locate in a constantly warm, but not hot place. In winter, tops of refrigerators and such are a good bet. In summer, almost anywhere will do in an un-air-conditioned place. Seek minimum temperatures of 70 and maximums of 90 degrees, F.

The next and final phase of culture is to establish an alternating cycle of moist, and then dry conditions. I generally loosen or remove the plastic or glass enclosure from the seed bed every 24 hours, especially during the cool, more humid time of night, and then reenclose during the warmer, drier daytime. This prevents the fungus of "dampening off" and drying out.

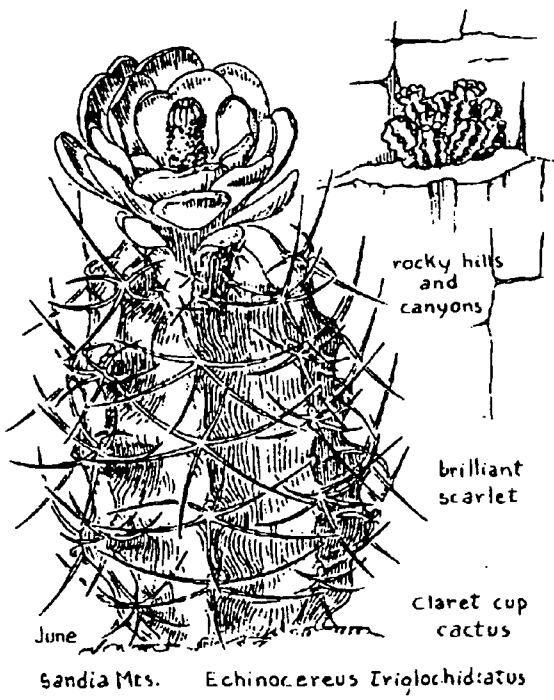
From the 5th to the 10th day after sowing, you can expect germination. The seedlings will resemble minute green globes. You may now reduce the hours of enclosure and place your seed bed in a bright, indirect light or in an Eastern exposure. Add water from above or below to maintain a slightly damp soil.



Two to three weeks after germination, the seedlings will exhibit the dicot condition of the family *Cactaceae* by clefting into two parts at the apex. Now, dispense with the enclosure. Let the seedlings air-out between waterings. Monitor the dampness of the soil every day and supply water when needed to maintain a damp, but not wet, condition. Introduce your seedlings to more light, being careful to not shock them with too much, too soon.

At six to eight weeks, you are well on your way to success. Add more light, and dry days, and reduce watering. Use your own intuition—that is, your green thumb— as a guide. At this point in their development, the seedlings will begin to grow spines, which are modified leaves.

After a year of growth, the plants will be sufficiently developed to require transplanting to a deeper clay or plastic pot of their own. In two to five years, depending on the species, the seedlings will mature and flower for the first time.



Bear Grass and the Yucca Moth

by Zoe Merriman Kirkpatrick

"Once upon a time" sounds like the title of an old-fashioned fairy tale, but actually the following story is stranger than some fiction and more interesting than many fairy tales—this tale of Bear Grass and the Yucca Moth.

Mother Nature has created a most interesting biological relationship between a plant and a moth, recognized as a mutual specialization of two organisms. The flowers are pollinated exclusively by these insects, and the larvae feed solely on their seeds. It is a prime example of "coevolution": two organisms co-evolving until a totally dependent relationship exists between them. Each is dependent upon the other for perpetuation of the species.

The plant is a member of the Liliaceae, or Lily, family. Several species are prevalent on the Rolling Plains, but the one that I have personally observed and studied is *Yucca angustifolia,* commonly known as bear grass, soapweed, cow candy or yucca.

This species is an evergreen plant that can have a stem or be stemless. On the Plains, it usually has no noticeable trunk or stem, and the leaves grow at ground level. Each plant has a cluster of many narrow, fairly flexible, sharp-tipped leaves, 1- 2 feet long and up to 3/8-inch wide. They are flat on the upper surface and convex on the underside, pale green with smooth narrow white margins. A leafless naked scape arises from the center of the plant to a height of 1 - 2 feet, from which a flowering inflorescence extends another 2 - 3 feet.

The bell-shaped flowers have 6 petal-like parts, or tepals, that are greenish-white, thick, brittle, broad, and pointed at the tip. The sepals are 1 in to 2 inches long and 1 - 1 1/4 inches wide. The petals are about 2 inches long and 1 - 1 1/2 inches wide. There are six stamens and a pistil with three green stigmas. Blooms appear in May and June. The fruit is a capsule about 2 inches long and 1 1/2 inches in diameter, oblong cylindrical in shape, green when first forming, then gradually drying to become brown when mature, and finally gray with age. The fruit splits open at maturity. Each locule of the three-chambered fruit has two compartments filled with thin, smooth black seeds (1/4- to 3/8-inch in diameter) stacked on top of one another.

The American Indians found that the root of this evergreen had a soap-like cleansing quality and used it for that purpose, hence one of its common names, soapweed. They also used other parts of the plant for food and drink (the buds, flowers, immature fruit pods and even the green stalks), for clothing (footwear made of dried leaves), in weaving baskets and fiber for ropes and mats. Early settlers often used bunches of the leaves to thatch their roofs. I have even experimented with the culinary aspects of the plant, preparing and eating the tepals a couple of different ways. I sugar-coated and slightly baked the tepals for a "candied" delicacy, and boiled another batch of fresh tepals, mixed them with fried bacon, diced onions and tomatoes, then scrambled this mixture with eggs for a tasty dish.

Cattle love to eat the tender green scape that rises from the center of the large clump of spike-tipped leaves in the late spring and early summer. They enjoy the flowers also, but rarely allow a plant the chance to bloom before eating the tender budding shoots, hence another common name, cow candy. (I sometimes wonder if the cattle are standing there waiting for the plant to send up these juicy morsels.) In a pasture of grazing cattle, one almost never will see any bear grass blooming. In nongrazed areas, the spiky clumps develop their large creamy greenish-white "top knots", standing tall enough to be easily seen from distances as great as 1/4 - 1/2 mile away.

The bear grass flowers contain a sticky pollen, but the reproductive organs are far enough from one another to make self-pollination virtually impossible. Therefore, the plant needs a special agent to carry pollen or it could not reproduce. That special agent is a small woolly white moth, of the family Incurvariidae, Genus *Tegeticula (Pronuba* spp.). (Other insect books place the yucca moth in the Family Tineadae, Genus *Pronuba.)* There are four known species of yucca moths belonging to this wholly American family of small moths, usually confined to the South, Southwest and Mexico.

The female moth visits many bear grass flowers at night, and lays a single egg, or possibly a few, in the ovary of each flower. But to be sure that the seeds will develop into food for the larvae, she must place pollen on the stigma of the flower, ensuring fertilization. With a special pair of extra-long, curled, spinelike tentacles, she collects the pollen from the stamens, rolls it into a ball, and tucks it behind her head. After laying the egg inside the ovary wall, using her piercing ovipositor, the moth pushes the ball of pollen she has collected down onto the stigma, repeating this maneuver on flower after flower, yucca plant after yucca plant.

Dependent on the yucca moth for this important act of pollination, the bear grass repays its white-robed benefactor by sacrificing some of its developing seeds as food for her larvae. As the pinkish-colored larvae develop, they will feed on some (but never all) of the tender, white, immature seeds. Later in its development, the larva eats its way through the wall of the seed-filled capsule, drops to the ground, and burrows into the earth where it undergoes transformation into the pupal stage. The next spring, at the same time the bear grass is blooming, it emerges from the ground a full-grown moth once again ready to repeat this age-old life cycle.

For years, this chain of events has been cited as a classical example of "symbiosis ', the living together of two dissimilar organisms in a mutually beneficial relationship. The yucca moth, most assuredly, does not "know" what she is doing, since she is incapable of"knowing" anything. She is simply following an instinctive pattern of behavior that her particular species evolved. Likewise, the bear grass has evolved its dependence on the moth.

If you like a photographic challenge, the next time you observe the bear grass blooming, draw close to the tall blooms and gently tap the drooping petals of several of the lovely soft, creamy-green flowers. As you "knock on the door" you may suddenly disturb a little white powdery moth, resting during the day after her nighttime labors. I was able to photograph, satisfactorily, this shy insect by doing just this.

Naturalist Zoe Merriman Kirkpatrick is the author of the field guide ***Wildflowers of the Western Plains.***

Editors Note: Many New Mexicans know *Nolina sp.* as "beargrass". Neither common name is "wrong" but the duplicity exemplifies the value of scientific names.

New Xeriscape Brochure Offers Handy (and Colorful) Water Conservation Tips

SANTA FE - "Enchanted" and "xeriscape" may not be words that most New Mexicans use to describe the same landscape. But a new brochure from the New Mexico State Engineer Office is designed to change the way we think about xeriscaping by showing just how colorful and beautiful water conserving landscapes can be.

"The Enchanted Xeriscape" is a full-color brochure which provides plenty of hands-on information about water-wise landscaping in New Mexico. It features color photographs of xeriscapes from throughout the state, plus photographs of specific low-water use plants. In addition, a list of specific plants and their water use requirements is included for each of New Mexico's three xeriscape climate areas - north/mountain, central and south.

"Our intention with 'The Enchanted Xeriscape' is to provide an introduction to the principles of water-wise landscaping," said Alice Darilek, Water Conservation Program Coordinator, State Engineer Office. "As a semiarid state, New Mexico has limited water resources. Promoting wise water use in outdoor landscaping can help ensure that our water supplies meet current and future demands."

As New Mexico's population continues to grow, water use and water supplies are becoming frequent topics for discussion and concern throughout the state. An increasing focus of water conservation efforts is to reduce the amount of water-thirsty landscaping including the overuse of the familiar bluegrass lawn.

"I'm glad that the State Engineer Office, Cooperative Extension Service and other agencies are working together to promote wise water use here in New Mexico," said Curtis Smith, Cooperative Extension Service. "Equally important is the fact that we're encouraging water conservation without saying that we have to make our landscapes ugly. When done properly, xeriscaping can be lush, beautiful and water efficient."

"The Enchanted Xeriscape" is the second residential water conservation brochure produced by the State Engineer Office. The first, entitled "Agua Action," offers an overview of water saving tips plus interesting water facts. Both brochures can be displayed as wall posters.

Free copies of "The Enchanted Xeriscape" and "Agua Action" are available by calling the State Engineer Office's Water Conservation Program at 505-827-3879 or 1-800 WATER-NM. Prices for large-quantity orders for municipal or commercial distribution are also available.

The Native Plant Society of New Mexico
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Las Cruces, New Mexico 88005

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Bear Grass and the Yucca Moth

by Zoe Merriman Kirkpatrick

"Once upon a time" sounds like the title of an old-fashioned fairy tale, but actually the following story is stranger than some fiction and more interesting than many fairy tales—this tale of Bear Grass and the Yucca Moth.

Mother Nature has created a most interesting biological relationship between a plant and a moth, recognized as a mutual specialization of two organisms. The flowers are pollinated exclusively by these insects, and the larvae feed solely on their seeds. It is a prime example of "coevolution": two organisms co-evolving until a totally dependent relationship exists between them. Each is dependent upon the other for perpetuation of the species.

The plant is a member of the Liliaceae, or Lily, family. Several species are prevalent on the Rolling Plains, but the one that I have personally observed and studied is *Yucca angustifolia,* commonly known as bear grass, soapweed, cow candy or yucca.

This species is an evergreen plant that can have a stem or be stemless. On the Plains, it usually has no noticeable trunk or stem, and the leaves grow at ground level. Each plant has a cluster of many narrow, fairly flexible, sharp-tipped leaves, 1- 2 feet long and up to 3/8-inch wide. They are flat on the upper surface and convex on the underside, pale green with smooth narrow white margins. A leafless naked scape arises from the center of the plant to a height of 1 - 2 feet, from which a flowering inflorescence extends another 2 - 3 feet.

The bell-shaped flowers have 6 petal-like parts, or tepals, that are greenish-white, thick, brittle, broad, and pointed at the tip. The sepals are 1 in to 2 inches long and 1 - 1 1/4 inches wide. The petals are about 2 inches long and 1 - 1 1/2 inches wide. There are six stamens and a pistil with three green stigmas. Blooms appear in May and June. The fruit is a capsule about 2 inches long and 1 1/2 inches in diameter, oblong cylindrical in shape, green when first forming, then gradually drying to become brown when mature, and finally gray with age. The fruit splits open at maturity. Each locule of the three-chambered fruit has two compartments filled with thin, smooth black seeds (1/4- to 3/8-inch in diameter) stacked on top of one another.

The American Indians found that the root of this evergreen had a soap-like cleansing quality and used it for that purpose, hence one of its common names, soapweed. They also used other parts of the plant for food and drink (the buds, flowers, immature fruit pods and even the green stalks), for clothing (footwear made of dried leaves), in weaving baskets and fiber for ropes and mats. Early settlers often used bunches of the leaves to thatch their roofs. I have even experimented with the culinary aspects of the plant, preparing and eating the tepals a couple of different ways. I sugar-coated and slightly baked the tepals for a "candied" delicacy, and boiled another batch of fresh tepals, mixed them with fried bacon, diced onions and tomatoes, then scrambled this mixture with eggs for a tasty dish.

Cattle love to eat the tender green scape that rises from the center of the large clump of spike-tipped leaves in the late spring and early summer. They enjoy the flowers also, but rarely allow a plant the chance to bloom before eating the tender budding shoots, hence another common name, cow candy. (I sometimes wonder if the cattle are standing there waiting for the plant to send up these juicy morsels.) In a pasture of grazing cattle, one almost never will see any bear grass blooming. In nongrazed areas, the spiky clumps develop their large creamy greenish-white "top knots", standing tall enough to be easily seen from distances as great as 1/4 - 1/2 mile away.

The bear grass flowers contain a sticky pollen, but the reproductive organs are far enough from one another to make self-pollination virtually impossible. Therefore, the plant needs a special agent to carry pollen or it could not reproduce. That special agent is a small woolly white moth, of the family Incurvariidae, Genus *Tegeticula (Pronuba* spp.). (Other insect books place the yucca moth in the Family Tineadae, Genus *Pronuba.)* There are four known species of yucca moths belonging to this wholly American family of small moths, usually confined to the South, Southwest and Mexico.

The female moth visits many bear grass flowers at night, and lays a single egg, or possibly a few, in the ovary of each flower. But to be sure that the seeds will develop into food for the larvae, she must place pollen on the stigma of the flower, ensuring fertilization. With a special pair of extra-long, curled, spinelike tentacles, she collects the pollen from the stamens, rolls it into a ball, and tucks it behind her head. After laying the egg inside the ovary wall, using her piercing ovipositor, the moth pushes the ball of pollen she has collected down onto the stigma, repeating this maneuver on flower after flower, yucca plant after yucca plant.

Dependent on the yucca moth for this important act of pollination, the bear grass repays its white-robed benefactor by sacrificing some of its developing seeds as food for her larvae. As the pinkish-colored larvae develop, they will feed on some (but never all) of the tender, white, immature seeds. Later in its development, the larva eats its way through the wall of the seed-filled capsule, drops to the ground, and burrows into the earth where it undergoes transformation into the pupal stage. The next spring, at the same time the bear grass is blooming, it emerges from the ground a full-grown moth once again ready to repeat this age-old life cycle.

For years, this chain of events has been cited as a classical example of "symbiosis ', the living together of two dissimilar organisms in a mutually beneficial relationship. The yucca moth, most assuredly, does not "know" what she is doing, since she is incapable of"knowing" anything. She is simply following an instinctive pattern of behavior that her particular species evolved. Likewise, the bear grass has evolved its dependence on the moth.

If you like a photographic challenge, the next time you observe the bear grass blooming, draw close to the tall blooms and gently tap the drooping petals of several of the lovely soft, creamy-green flowers. As you "knock on the door" you may suddenly disturb a little white powdery moth, resting during the day after her nighttime labors. I was able to photograph, satisfactorily, this shy insect by doing just this.

Naturalist Zoe Merriman Kirkpatrick is the author of the field guide ***Wildflowers of the Western Plains.***

Editors Note: Many New Mexicans know *Nolina sp.* as "beargrass". Neither common name is "wrong" but the duplicity exemplifies the value of scientific names.