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USA 13



ALBUQUERQUE, N.M.
MAY 12
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P.M.

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Populus angustifolia Narrowleaf Cottonwood

Male & female flowers on different trees in long catkins. Trees flowering near Santa Fe in April & May. Drawing, Kathy Isaacs



Native Plant Society of New Mexico
May Newsletter

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Our thanks to Dr. Thomas Todsén for his talk on native orchids. Their beauty and diversity were wonderfully captured in his slides. And that we have so many species in N.M. was, I think, a surprise to most of us. It was also very good of Dr. Todsén and exciting for us to have him share the locations where he has found each of the species.

May speaker: Roger Peterson will speak on Flowering Parasitic Plants of New Mexico, Tuesday, May 17, 7:30 p.m., St. John's College, Senior Common Room, Peterson Student Center.

The field trip to Dog Creek Canyon in the Sacramento Mts., led by Bob Reeves, was absolutely splendid. Bob Reeves and Don Carpenter are so knowledgeable about cacti, and many cacti were found, as well as many other beautiful plants. Up from the floor of the plain (south of Alamogordo), covered with creosote-bush (*Larrea tridentata*), Ocotillo (*Fouquieria splendens*), Crown-of-thorns (*Koeberlinia spinosa*), Fluffgrass (*Tridens pulchellus*), and many wildflowers and other grasses, is the spring fed Dog Creek. It was luxurious with the native ash, the Arizona grape, banks covered with yellow columbine (*Aquilegia caryantha*), maiden-hair fern, and large clumps of the orchid, *Epipactis gigantea*.

The main object of pursuit - the cacti - are listed below. *Echinocereus stramineus* was in bloom everywhere, sometimes high clumps, with many large purple blossoms. Others which were in bloom are asterixed.

Ancistrocactus uncinatus *
Coryphantha macromeris
Echinocereus horisonthalonius *
Echinocereus enneacanthus var. *stramineus* *
Echinocereus pectinatus var. *neomexicanus* *
Echinocereus triglochidiatus var. *gurneyi*
Epithelantha micromeris *
Escobaria strobiliformis
Mammillaria lasiacantha
Mammillaria microcarpa
Opuntia englemannii
Opuntia imbricata
Opuntia leptocardis
Opuntia phaecantha
Opuntia violacea var. *macrocentra*

Folks came up from Las Cruces, and those of us from Santa Fe were hosted by Bill Mayfield of Bent, N.M., a wonderful host and devoted to the plants of the Chihuahuan Desert, - indeed hoping to write about them and eager for collaborators.

May Field Trip: Monday, May 30 (Memorial Day Holiday), to Cactus Hill, near Las Vegas, to look for wildflowers, led by Gussie Schooley. Santa Feans - car pooling at 9 a.m. at the Coronado Shopping Center, in front of Furr's. For those coming from other directions - contact Gussie Schooley for the meeting place - P.O. Box 5, Montezuma, N.M. 87731 telephone 425-7209.

May Plant Sale: For the benefit of an arboretum for Santa Fe! Please tell everyone you know to come; having the word spread will make all the difference. Please contact Rubye Mullins, 988-5427, if you can help during May or on the day of the sale itself. The sale will be Saturday, May 28, 9 a.m. to 6 p.m., at St. John's Methodist Church, the corner of Old Pecos Trail and Cordova Rd.

The following is as complete a list as can be made at this time of what will be offered. We hope (!) more plants will be donated during May.

NATIVES: Herbs & Ground Cover & Shrubs & Trees

Acer glabrum	Rocky Mountain Maple
Amelanchier sp.	Serviceberry
Anorpha sp.	Leadplant
Antennaria parviflora	Pussytoes
Artemesia frigida & trifoliata	Sage
Aquilegia spp.	Columbine
Cercocarpus montanus	Mountain Mahogany
Chrysothamnus nauseosus	Chamisa
Clematis spp.	Clematis
Cornus stolonifera	Redtwig Dogwood
Cowania stransburiana	Cliffrose
Ephedra viridis	Joint-fir
Eurotia lanata	Winterfat
Fallugia paradoxa	Apacheplume
Forestiera neomexicana	N.M. Privet
Gutierrezia sarothrae	Snakeweed
Gilia coronopifolia	Standing Cypress
Mahonia repens	Creeping Oregongrape
Penstemon pinifolius	Penstemon
Potentilla fruticosa	Shrubby Cinquefoil
Prunus americana	Wild Plum
Prunus virginiana	Chokecherry
Ptelea trifoliata	Wafer Ash
Quercus gambelii	Gambel's Oak
Rhamnus sp.	Columnar Backthorn
Rhus trilobata	Squawbush
Ribes cereum	Wax Current
Robinia neomexicana	N.M. Locust
Rubus parviflorus	Thimbleberry
Sambucus callicarpa	Red Elderberry
Shepherdia argentea	Buffaloberry
Tamarix parviflora	Salt Cedar
Yucca spp.	Yuccas

BEDDING PLANTS & PERENNIALS

Achillea "Golden Plate"
Ageratum
Campanula glomerata
Chrysanthemum "Clara Curtis"
Gloriosa Daisy
Heuchera, Coral Bells
Linum lewisii, Blue Flax, native
Lobelia cardinalis, Cardinal Flower, native
Marigolds
Petunias
Portulaca
Salvia
Sedums
Snap Dragons
Sweet Alyssum
Tradescantia spp.
Tobacco, flowering

GROUNDCOVER

Polygonum "Border Jewel"
Potentilla vera nana
Saponaria
Staghorn Sumac

MISCELLANEOUS

Hardy Trees: Horsechestnut- Aesculus sp., Hackberry- Celtis
occidentalis, Canyon Maple- Acer grandidentatum
Honeysuckle "Tartarian Red"
Strawberries

HERBS

Basil	Dill	Rosemary
Basil, Dark Opal	Lavender	Sage (<i>S. officinalis</i>)
Camomile	Marjoram	Spearmint
Catnip	Oregano	Tarragon, French
Chives	Parsleys	Thyme, English
Comfrey	Peppermint	& some more unusual herbs

HOUSEPLANTS

Agapanthus
African Violets
Coleus
Geraniums
Scented Geraniums
Kalanchoe hybrids
Mimosa pudica, the Sensitive Plant
Ornithogalum caudatum, Pregnant Onion
Plectranthus australis, Swedish Ivy
Rhoeo spathacea, Moses in the Cradle

CACTI & SUCCULENTS

Aloe Vera
Bryophyllums
Crassula argentea, Jadeplant
Lithops, Living Stones
Portulacaria
Sempervivums, Hens & Chicks
South American & Native Cacti

MINIATURE ROSES

Beauty Secret, Rosetone, Simplex, Starina, Toy Clown, White Angel, White Madona, Yellow Doll, & many, many more!

ORCHIDS

all in bloom; many genera; flown in from Hawaii

ANTHURIUMS

Obakis, Reds, Oranges; all in bloom; flown in from Hawaii

SEEDS OF NATIVE PLANTS

Native grasses: mix
Echinocereus triglochidiatus, Claret Cup Cactus
Gaillardia pulchella, Indian Blanket
Linum lewisii, Blue Flax
Oenothera hookeri, Yellow Evening Primrose

SEEDS, cont.

Penstemon barbatus, Scarlet Bugler
Ratibida columnaris, Prairie Coneflower
Verbascum thapsus, Mullein
Viguiera dentata, Golden-eye

PLANT GUIDES & HANDBOOKS

Earle, Hubert, Cacti of the Southwest
Kelly, George, Trees for the Rocky Mountains
Lamb, Samuel, Woody Plants of New Mexico
Nelson, Ruth, Handbook of Rocky Mountain Plants
Yanda, Susan & Bill, Attached Solar Greenhouses
all of the Brooklyn Botanic Garden Handbooks - every different subject, including vines, mulching, pruning, propagation, rock gardens, dye plants, garden nests, bonsai, landscaping, breeding, wildflower gardening, etc.

LEAFLET

Native Plants for Landscaping in Northern New Mexico,
prepared by the Native Plant Society

SOURCES OF THE PLANT MATERIAL

Western Evergreens, Golden, Colorado
Jack's Mini Roses, Albuquerque, N.M.
The Herb Shop, Santa Fe, N.M.
Agua Fria Nursery, Santa Fe, N.M.
Grassland Resources Inc., Santa Fe, N.M.
Steven Brack's Cacti, Belen, N.M.
Bette Vaninetti's Cacti, Santa Fe, N.M.
Stanley Taba, Oahu, Hawaii
& many, many hardworking individuals

Water Conservation: Drip/Trickle Irrigation

According to one authority Arizona pumps 650 billion more gallons of ground water each year than nature can replace. Some land in Arizona is settling, as it is also in California's heavily pumped San Joaquin Valley (Sunset, July, 1975). Some estimates of ground water withdrawal in New Mexico are also impressive. And the lifegiving Rio Grande is so heavily used that the water designated for the s.w. U.S. falls short, and the water designated for Mexico falls very short, and is so saline by the time it reaches our neighbors as to endanger their crops. As to the cost of water, in Santa Fe we have just had a 120% city water price increase, Los Alamos anticipates the same, and we are assured that prices will go up here and elsewhere again. In the Chihuahuan Desert, which comprises much of central and south N.M., the water situation is even more critical.

No small measure in water conservation should be beneath our attention (including rocks in the toilet tanks), but outdoor watering is far and away our biggest use, our biggest expense. Drip/trickle irrigation for gardens, trees and shrubs, and lawns (which should be minimal) offers some advantages over other ways of watering. Among the advantages are water savings of 20-50%; drip systems are low pressure systems; water with ³times higher salt content can be used without damage than can be with sprinkling because the moisture content of the soil fluctuates less and the salts are kept diluted; some weed control is effected as only the area next the desired plants is watered; the profile of water in the ground is narrower and deeper with drip watering (shallower and more spread out with flood watering); soil compaction is reduced or eliminated; surface evaporation is minimized; surface run off is eliminated.

Drip/trickle systems consist of pipe or hose carrying water at low pressure, about 4 psi (city water pressure is 40-80 psi) to the lateral pipe lines, coming from the mainline, which run the length of the rows in the field. The low pressure can be gotten in a small system by just cracking the faucet open. Because it is a low pressure system small diameter pipe can be used. Mainlines can be 2" or less, e.g. garden hose in a small system; laterals can be 3/4" or 1/2" or 3/8". Rigid pipe or non-rigid hose can be

used. Holes are punched in the lateral lines and emitters inserted. Emitters further lower the water pressure by directing the water through them in a twisting path, then the water comes out very slowly. Emitters vary a great deal, from little nylon half spheres that fit flat against the lateral lines to microtubing which might string out quite a ways from the lateral lines. Low pressure emitters may cost 7¢ apiece. High pressure emitters (about 15 psi - only relative high pressure) can allow the lateral lines to be longer and serve more emitters before friction becomes a problem. These higher pressure systems are used in larger commercial farms and orchards. The high pressure emitters are more costly. For example, the fancy vortex emitters are about 75¢. They spin the water inside the emitter, centrifugal force creates low pressure at the center of the vortex chamber and the water comes out from the center at the lowered pressure.

The tiny holes of the emitter necessitate a filtering system so that particulates on the water do not block the holes. Calcium carbonate in the water can also be a problem. The drip systems are only workable with screens or filters. 80 or perhaps 200 mesh screen is recommended. Screens cost a few dollars, filters with replaceable cores are considerably more.

When designing a system it must be kept in mind that the mainline and the laterals can only be of a certain length depending on their diameter, because of frictional losses. The larger their diameter the longer they can be. For example, one manufacturer recommends, with emitters on 2 ft. spacing, 3/3" hose for row lengths up to 100 ft., and 1/2" hose for row lengths up to 200 ft.

A mature lettuce plant may require 5 gals of water per day, a mature grape 15 gals/day, a mature walnut tree 115 gals/day. Figured in these estimates is temperature, relative humidity, wind, and sky cover, so of course there is enormous variation from place to place and with the seasons, as well as with the soil - clay holds water well, sandy soil does not. Having emitters every 18" is recommended for gardens; two or three emitters at a tree may be needed. Since most of us using a drip system for our garden would not know exactly how much water is delivered to each plant (though we can collect the water from an emitter for an hour in a jar to see how much it gives), and how much in our conditions is needed by each plant, we must experiment

to see what makes the plants thrive. With a system commonly recommended for gardens, of 2 gals per emitter per hour, we could start by seeing if having the water on a couple of hours every other day would suffice. The point is to water often but slowly giving roots a steady supply of water, not saturating them (which gives too little oxygen) or drying them out where they suffer not just from water shortage but from lack of nutrients taken up in the water.

The pipe or hose may run above or below ground. An above ground system is easier to keep track of where digging is necessary, but any system should be buried under mulch. Mulching is the secret with drip/trickle or conventional watering systems. It prevents evaporative losses which in our land are enormous, and it can protect plastic pipe that deteriorates rapidly in the sun. The question of flexible or rigid pipe is often decided by availability and price. Flexible hose might be easier to remove when plowing across as well as down rows, it also might be easier to store during the winter because it rolls up, but these things depend on the system, one might have a system where the lines are never moved at all.

A device which attaches to the end of the hose with a handful of microtubes to water several individual plants costs under \$10, a kit for a 50 sq. ft. area \$15, for a 120 sq. ft. area \$30, for a 1000 sq. ft. area \$100. Suppose water bills were lowered \$15 a month average for spring, summer and fall (a conservative estimate) by a drip system on a 1000 sq. ft. garden. It would only be about a year before the system paid for itself and started saving money - not to mention the water saving. But the high initial cost, confusing array of products, difficulties with clogging the system, and the untried, untested present state of drip/trickle irrigation here is enough to discourage anyone. A year from now perhaps there will be more to offer on the subject. Below an existing system is described. It is not commercially designed, and has interesting modifications from a straight drip/trickle system. In coming newsletters we hope to have other existing systems outlined.

It should be added that there are drip/trickle systems with no emitters. Twin wall or biwall pipe has a flattened figure eight cross section - it delivers water through tiny holes, spaced for example every 4" in the outer tubing, every 24" in the inner tubing, which allows even water distribution over the whole length of the pipe. There is also

available polyethylene tubing with porous sides, and porous paper tubing that is disposable and appropriate for one season use.

There is a leaflet on drip/trickle irrigation available from the Agricultural Extension Service, Rodeo Rd., telephone 471-4711, written by C.M. Hohn, State Agricultural Engineer.

A list of drip/trickle distributors, from Flower and Garden Magazine, with additions of the Albuquerque companies that have answered our inquiries is available from the Native Plant Society.

Clay Buchanan's Trickle System

The grounds of the State Capitol Building are landscaped by Clay Buchanan. It is the finest landscaping accomplishment in Santa Fe. Where sprinkler systems existed, they stayed, but Mr. Buchanan has used trickle irrigation where it was practical - near the east entrance, for the roses near the library, in the median planting area of the visitors parking lot, and most recently in the Lamy Building patio. His system has strong advantages over orthodox drip systems because it does not require any filtering or flushing with acid each year to unclog holes, nor does it require any emitters. He has simply made 1/32" holes in plastic pipe - that size for holes is not so small that it becomes clogged by the particulates in the city water. The water in his lines is low pressure, 2-4 psi (gotten by only cracking the faucet open). The pipe is what was available or inexpensive. He has used 1/2-1 3/4" PVC. (The larger the pipe the less pressure loss due to friction, so with larger pipe the holes far from the water source are more equally supplied). The 1/32" holes are spaced according to the plants being watered and their place in the system, e.g. two holes at a tree, holes at the top of a slope 32" apart. The trickle system is under about 6" of pecan mulch which aids in allowing the water to spread laterally as well as eliminating evaporative loss. Mr. Buchanan says he can not estimate the savings due to the trickle system alone, but would estimate that the heavy mulching which he does in all planted areas has meant a 60% water savings.

Mr. Buchanan is helping Phyllis Hughes plan this type of simplified trickle system for the wheelwright Ethnobotanical Garden.