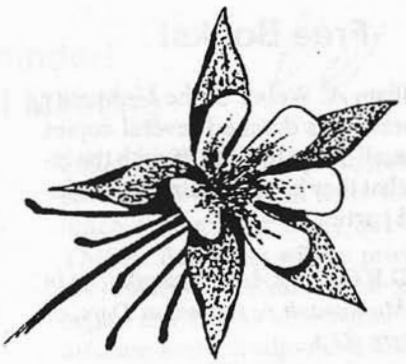
Aquilegia



Newsletter of the Colorado Native Plant Society

". . . dedicated to the appreciation and conservation of the Colorado native flora"

Volume 14, Number 4 **July/August 1990**

Botanical Travel Notes from Crete

by Elizabeth Otto

Earlier this year, I had the opportunity to visit the island of Crete off the mainland of Greece. We arrived in Greece on April 11th. After a quick trip to Delphi to consult the oracle, we flew on to Crete to spend the next two weeks traveling from one end of the island to the other. Crete is well known for its warm, Mediterranean climate, farm produce (the tomatoes, oranges, artichokes were at their peak!), sunshine and beautiful turquoise seas. It is also well known for its rare flora. Of the over 2000 or so species of higher plants found on the island, about 250 are endemic to Crete with over 160 species exclusively endemic to the island. This list is continually growing as new, rare species are discovered in the numerous gorges or remote mountain areas.

Although our main objective was to visit the ancient Minoan palace and town sites, a botanist, or anyone else for that matter, could not help but notice the magnificent display of spring wildflowers. Red poppies (*Papaver rhoeas*) covered the hillsides and olive groves. *Carpobrotus acinaciformis*, a member of the Aizoaceae family with large composite-like magenta flowers with yellow centers, spilled over the seaside cliffs. With its thick, fleshy leaves and stems, this plant is well adapted to its salty habitat. Members of the mint family scented the air with both their blossoms and aromatic leaves. And the spring bulbs sprinkled the slopes and roadsides with bloom.

Although in its geologic history Crete was often joined to the adjacent continents of Europe, Asia and Africa, it was also completely isolated for long periods of time – enough time for species to differentiate. In fact, because many endemic plant species are restricted to specific localities, it is thought by geologists that Crete may have been broken up into two or more separate islands at times. The majority of Crete's endemic plant species are concentrated in certain regions such as the White Mountains of western Crete, the mountains south of Sitia in eastern Crete, and those mountains west of the Plain of Messara in south central Crete.

Our trip across Crete began in Iraklion on the eve of Easter. After celebrating the Greek Orthodox Easter in a little coastal town east of Iraklion, we continued eastward, stopping first at the mountainous Doric Greek site of Lato outside the modern village of Kritsa. Rambling over the ruins, we spied *Dracunculus vulgaris* var. *cretica*, the Great Dragon, growing up from the bottom of an ancient cistern. *Dracunculus* is a member of the Araceae family and has a huge (over 40 cm tall) dark brownish purple spathe and like-colored spadix. The plant itself reaches 100 cm, making it quite impressive. We encountered the Great Dragon everywhere on Crete, but never the rare white form reported to grow on Crete. Related to skunk cabbage, *Dracunculus* flowers allegedly have a nauseating smell to lure pollinating flies.

After a day of shopping in the weaving shops of Kritsa, we moved eastward to the Minoan village site of Gournia overlooking the Gulf of Mirabello on the north coast. Here we saw *Chrysanthemum coronarium* var. *discolor*, the bicolored form of the crown daisy, *Gladiolus communis*, and *Ornithogalum montanum*, star of Bethlehem, among others.

Stopping for lunch in the olive grove next to the site, I spotted *Anacamptis pyramidalis* ssp. *brachystachys*, pyramidal orchid – our one and only orchid of the trip. I had been hoping to find a "bee" orchid (*Ophyrs* spp.), but with no luck this trip.

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Free Books!

Dr. William A. Weber of the University of Colorado has donated several copies of two small books to CONPS with the intention that they be distributed free to interested parties.

Savile, D.B.O. 1972.*Arctic Adaptations in Plants. Monograph 6, Canadian Dept. of Agriculture. 82 p.*

Flowers, Seville. 1961. *The Hepaticae* [Liverworts] *of Utah*. Univ. of Utah Biol. Series. 89 p.

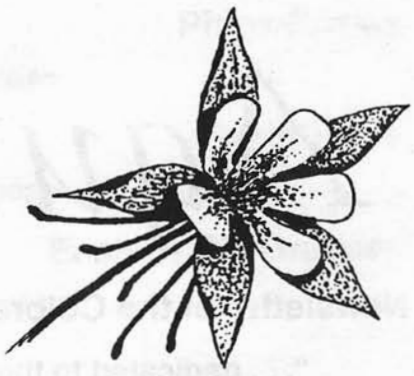
If you would like a copy of either of these books, contact Bill Jennings at 666-8348.

First come, first served!

Summertime Blues???

A second short issue suggests that Society members are too busy visiting new plant localities and experiencing new activities to be *writing* about those places and experiences! As summer winds down, we encourage you to summarize any exciting (or even just interesting) plant-related events of your summer, and send us some new articles or illustrations! Call Peter Root if you'd like to discuss potential topics for *Aquilegia*. We'd like to hear from you, and share your reports in future issues.

The lateness of this issue indicates that the Editorial Committee is not immune to seasonal distractions either! Our apologies – we'll be back on schedule next issue. We appreciate typing assistance from Jim Borland, and note that the delay was NOT at his end!



Aquilegia is printed on recycled paper

Aquilegia

Aquilegia is published six times per year by the Colorado Native Plant Society. This newsletter is available to members of the Society, and others with an interest in native plants. Contact the Society for subscription information.

Articles from *Aquilegia* may be used by other native plant societies if fully cited to author and attributed to *Aquilegia*.

The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado native flora. Membership is open to all with an interest in our native plants, and is comprised of plant enthusiasts, both professional and non-professional.

Please join us in helping to encourage interest in enjoying and protecting the variety of native plants in Colorado. The Society sponsors field trips, workshops and other activities through local chapters and statewide. Contact the Society or a chapter representative or committee chair for more information.

Schedule of Membership Fees

Life	$250.00
Family or Dual	$ 12.00
Supporting	$ 50.00
Individual	$ 8.00
Organization	$ 25.00
Student or Senior	$ 4.00

Membership Renewals/Information

Please direct all membership applications, renewals and address changes to the Membership chairperson, in care of the Society's mailing address.

Please direct all other inquiries regarding the Society to the Secretary in care of the Society's mailing address.

Newsletter Contributions

Please direct all contributions to the newsletter to:

Peter Root
4915 West 31st Avenue
Denver, CO 80212

Deadlines for newsletter materials are February 15, April 15, June 15, August 15, October 15 and December 15.

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Denver Chapter News

The first meeting of the year will be September 26th at 7:30 PM. Please bring five to ten slides of some interesting plants to share, as well as a potluck dessert. We will be meeting at the Denver Botanic Garden again this year, but now at the Morrison Center Facility. Call Carol Dawson, 722-6758, for details if needed. See you then!

Coming Next Issue!

The Search for Rare Plants, an update from Bill Jennings on recent rare plant finds in Colorado!

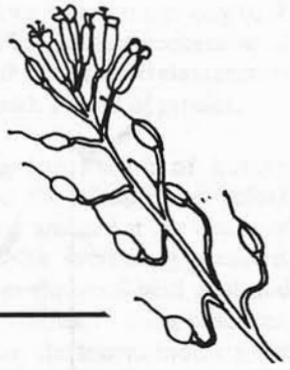
Reminder! Annual Meeting

Members should already have received announcements of the 1990 Annual Meeting of the Colorado Native Plant Society. The meeting will be held at the YMCA of the Rockies in Estes Park. This year's topic is **Barbarians at the Gate: Exotic and Weedy Plants of Colorado**, and presentations on defining weedy plants, exotics in the Colorado flora, and weedy plant biology are scheduled.

The meeting offers two concurrent field trips on Saturday morning. Participants may meet at Lyons Sandstone Park for a trip on the east slope, or at the Kawuneeche Visitor Center for a drive over Trail Ridge from the west slope to the meeting site. Field trip participants will meet at 8 AM.

Following the field trips, members and attendees will meet at noon for a sack lunch (bring your own) back at the YMCA. Beverages will be provided by the Society. The afternoon program begins at 1:15 PM with a brief business meeting, and will adjourn at 4:30 PM. A meeting of the Board of Directors will follow the adjournment.

To reach the YMCA, turn west at the marked intersection on Colo. Hwy 66, approximately 2.5 miles south of Estes Park.



CONPS Workshops for 1990 – 1991

Bill Jennings

The Colorado Native Plant Society workshop series was established with the objective of having something to do during the winter when field trips are impossible. Since the first workshop in January 1985, 44 have been held.

Our concept of a workshop means bringing together plant lovers and a well-informed instructor who has photographs, herbarium specimens and live plants for the attendees to study hands-on, with opportunities for one-on-one interaction with the instructor as well as lectures to the group as a whole. No special skills or requirements, other than a love of plants and a desire to learn, are necessary for attending a workshop. Even though the descriptions may make these workshops sound highly technical, the case is exactly the opposite. The objective is to demystify plant identification and to allow the confused but sincere plant lover to better enjoy and understand our native plants.

Registration for Workshops

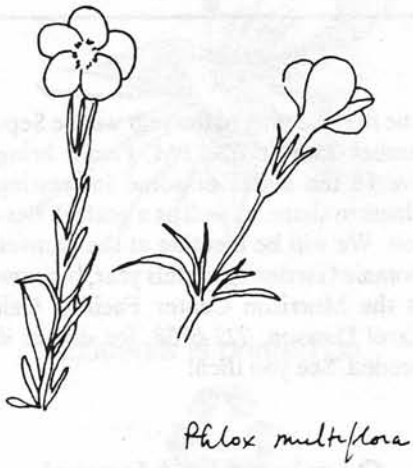
Enrollment in workshops is always limited, usually due to room constraints, so you must register in advance. Contact CONPS workshop coordinator for registration and workshop information: **Bill Jennings, PO Box 952, Louisville, CO 80027; phone 303-666-8348.** Be sure to include your mailing address and phone number if you mail in your registration. Registrants will be notified by mail about two weeks prior to the workshop regarding final location, time, lunch, suggested references, etc.

Please register promptly, as workshops tend to fill up fast. However, cancellations sometimes create openings, so you might want to check with Bill up to the night before the workshop if you want to try to register at the last minute.

Unless otherwise noted, the fee for **each** full-day workshop is $8 for members and $16 for non-members. If you plan to attend more than one workshop per year as a non-member, it is cheaper to join CONPS as an individual member ($8 per year) and come to workshops as a member. Please hold payments until the day of the workshop.

It takes considerable time and effort for the instructors to plan and develop workshops and field trips. Please let us know how you like the workshops and field trips offered by CONPS. We need your suggestions for other workshops and trips, as well as your feedback on whether you found them informative and exciting or dull and uninteresting. We need to know whether we are serving you, our members, the way you wish.

CONPS Workshops for 1990 – 1991



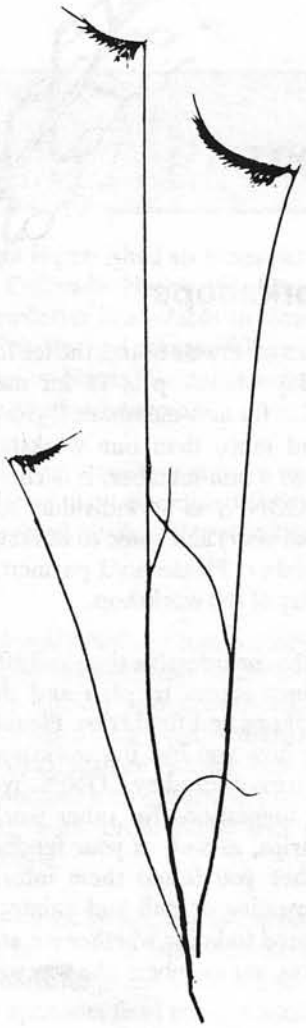
Polemoniaceae: The Phlox Family
Saturday, November 3, 1990

Leader: Dr. Dieter Wilken

The Phlox Family includes some of our showiest and most popular spring wildflowers, including those in the genera *Ipomopsis, Gilia, Phlox* and *Polemonium*. Dr. Dieter Wilken, who has spent his career studying this family, will help us to key the problem taxa.

Much recent research has led to significant changes in classification in the Phlox Family and Dr. Wilken will bring us up to date.

To be held at Colorado State University. **NOTE: There will be no fee for this workshop.**



Willows: Genus Salix
Saturday, December 8, 1990

Leader: Dr. David Cooper

Dr. Cooper has been studying the wetland plants of Colorado or many years and has discovered numerous significant new populations in a variety of plant families. This workshop, the third in Dr. Cooper's series focusing on wetland plants, will cover the willows (prior workshops were on *Carex* and *Juncus*).

Willows can be difficult to identify because flowering catkins, fruiting catkins, and leaves appear at different times, and all are often needed for final identification.

To be held at Colorado School of Mines.

Grasses of the Eastern Colorado Plains
Saturday, January 12, 1991

Leader: Dr. Alan Carpenter

Grasses are avoided by wildflower lovers because the flowers are not photogenic and the terminology used for floral parts is unique. However, considering both their economic and ecological significance, all Colorado botanists should have a working knowledge of the grasses.

Dr. Carpenter will help us understand the species in this important family that are found on the eastern plains. This workshop complements our prior workshops on common grasses and high-altitude grasses.

To be held at the Foothills Nature Center, Boulder.

continued from page 1

Our next stop was the beach at Itanos on the far northeastern tip of the island. The tourist beach at Vai, just south of Itanos, is better known and more popular, but Itanos shares the same sea, sun and sand – without the tourist hordes. It also is home to the only palm native to Greece, the rare, endemic *Phoenix theophrastii.* It's odd to think of these large, squat palms as rare, but they are found only on the sandy coastal valleys near Itanos and Vai.

While rambling over the old Byzantine church ruin (ruins are everywhere in Crete), I stumbled upon a little *Gynandriris monophyllum*, barberry nut. Barely 4 cm tall, this member of the Iridaceae looked like a miniature iris with blue-purple petals with yellow center markings. A larger relative, *G. sisyrinchium*, is thought to have been a model for the floral designs in Minoan frescos, paintings and pottery.

Our trail next led us south along the eastern coast to the Minoan palace site at Kato Zakros. As at so many of the other sites, red poppies, bicolored crown daisies and German tourists covered the floors and remaining walls.

Anxious to find a place to settle down and stay for a while, we drove back across the island to the city of Chania on the north west coast. Chania, as all of Crete, was under Venetian, then Turkish, rule for many years. The Venetian influence has held out against the original Greek and Turkish, giving Chania the feel of an Italian coastal city. Narrow, labyrinthine streets and alleys converge on the waterfront lined with restaurants and shops. Although Chania clearly caters to the tourists, it does so in a most tasteful manner.

From our rooms at the Casa Delphino, we explored the mountains and beaches around Chania. Though we did not do the Samarian Gorge (a must for anyone with a day to spend climbing over boulders through a dry stream bed to the southern seacoast), we did ramble down one of the many other gorges in the foothills of the White Mountains. The White Mountains of Crete are similar to the Rockies and, even in April, still had snow-capped peaks.

Here we saw more Great Dragons as well as other members of the Araceae: *Arisarum vulgare*, friar's cowl, and *Arum maculatum*, lords and ladies. We also saw *Cyclamen cretica*, a white cyclamen in full bloom on the damp walls of the gorge and a fern that looked like a *Dryopteris*. The only plant books I was able to find in Greece totally neglected the ferns, a major oversight in my opinion. Leaving the dark, rocky gorge, we climbed up along the rim to see, and smell, *Phlomis fruticosa* (Jerusalem sage), *Muscari* spp., grape hyacinths, and the ubiquitous red poppies.

Our final day in Crete was spent madly visiting the remaining Minoan palace sites and running through the Iraklion museum. There was little time for botanizing. The site at Phaestos is beautiful. The palace is oriented toward the twin peaks of Mount Ida with a magnificent view down to the Plain of Messara and the sea to the south. The site is reported to be covered with *Anemone* spp., and *Mandragora officianarum*, mandrake, in early spring, but we were either too late, too early, or too rushed to notice. On the hillsides around the site can be found *Orchis italica*, an orchid with large pink heads.

The Minoan palace at Knossos we left for last. Unfortunately, that gave us little time to see much more than the site itself. The excavation at Knossos was begun in March 1900 by Sir Arthur Evans and is thought by some to be the ancient palace of King Minos, of Minotaur and the labyrinth fame. Evans partially reconstructed the palace providing the visitor with a visual idea of what the palace may have looked like. There is a great deal of controversy over this reconstruction in the archeological community, but I found it tastefully done.

Once around the site, rush through the museum and we were on our way back to Athens. The greatest excitement of that trip was sharing a third class section on the ferry with a band of gypsies.

Considering the length of human civilization on the island (from before 3000 BC) I was amazed at the wealth of the flora. With increasing pressure, however, from the semi-wild goat and sheep herds, intense farming practices, and, I presume, the tourist industry, the wild areas of Crete are threatened. The forests of Crete were famous in historic time. There are but remnants left. With the increasing use of herbicides and other agricultural chemicals, plant and animal species are beginning to disappear. One can only hope that as Greece becomes a full member of the European Economic Community and the standard of living continues to rise, its people will be willing to set aside more areas for preservation and spend more on environmental protections. ♣



Map of Crete

from *Flowers of Greece and the Aegean*
by Anthony Huxley and William Taylor

The Prairie Garden, Part III: Planting Grasses

Rick Brune

Planting a shortgrass prairie garden involves two basic types of planting: broadcast seeding of native grasses in high density plantings and planting wild flowers and shrubs in lower densities as individual specimens. This article deals with establishing the dominant grasses, blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*) with perhaps a lighter seeding of other species.

The next article in this series will discuss the pros and cons of different methods for planting wild flowers including planting wildflowers at the same time as the grasses. I suggest you consider waiting one year after planting grass before planting wildflowers. This allows more options for weed control.

Planting Time

Prairie grass seeds may be sown in spring or fall. The main advantage to fall planting is that the seed will germinate at the earliest possible date and take advantage of early spring moisture. Because we will provide supplemental watering, this is less important. The disadvantage to fall planting is the seed is left out over winter to be eaten or washed or blown away. Also, cool-season weeds may germinate before warm-season grasses.

In my experience, spring planting from about May 1 to early June works very well. Planting after mid-June during very hot weather results in poor germination. Prairie seed germinating during hot weather just before the onset of summer drought is unlikely to survive. Most such seed was probably removed from the gene pool long ago through natural selection. Spring planting also provides one more opportunity for weed control.

Soil Preparation

Rototilling the site is the only soil preparation required. Unlike turf grasses, prairie grasses establish best on a lumpy seed bed. Lots of 1 inch lumps are great. Just level the seed bed after tilling.

I do not recommend adding any soil amendments or fertilizer. Blue grama shows a *negative* response to nitrogen. Because it is a very immobile element in alkaline soil, most of our yards probably still contain enough phosphorus to be mined. Potassium deficiencies are rare.

Seeding Rates

Buffalograss lawns are seeded at rates of 2 to 5 lbs/1000 ft^2 for cover in one year.

Blue grama seed is much lighter and produces a thick turf at rates of 1 lb/1000 ft^2 or more. At rates of 0.5 lbs/1000 ft^2 or less, it gives more of a bunchgrass appearance.

In a shortgrass prairie, blue grama is usually more abundant than buffalograss. A typical ratio is about 6:1. Planting 0.5 lbs blue grama and 1 lb buffalograss per 1000 ft^2 gives a ratio around 18:1. This is accurate enough for our purposes and produces a turf thick enough to exclude weeds the second year, if not the first.

If you expect a serious weed problem, plant 1 lb of each per 1000 ft^2. This will produce a nice lawn if you don't proceed with your prairie garden. It is OK to sow only blue grama in some areas and only buffalograss in others for different effects.

If you purchase rather than collect your seed, try to get local genotypes or at least avoid cultivars selected for their unusual height, vigor, etc. [You may wish to contact your SCS office for information on cultivars.]

Planting Buffalograss

Buffalograss should be planted 0.5 to 0.75 inches deep. I plant buffalograss by making furrows about one inch deep and 6 to 12 inches apart, then broadcasting the seed and raking it in across the furrows. This insures that much of the seed is buried deeper than you get it by just raking it in. Any appearance of planting in rows will quickly disappear.

Treated buffalograss seed, recognizable by its blue-green color, germinates in 7 to 10 days. Untreated seed germinates over a period of 3 years. Use treated seed.

Planting Blue Grama

Although blue grama can be planted almost as deep as buffalograss, I get excellent germination and coverage by broadcasting it over the area just seeded with buffalograss. Rake it in also. Germination requires 4 to 5 days.

Other Grass Species

Lightly seeding other shortgrass species will add variety but is not necessary. I recommend initially planting only warm-season grasses to maintain a uniform appearance. This also makes it easier to spot cool-season weeds such as quackgrass (*Agropyron repens*) and bluegrass (*Poa pratensis*).

Side-oats grama (*Bouteloua curtipendula*) is an attractive warm-season midgrass growing about two feet tall in shortgrass prairies. Consider sowing 0.5 ounces/1000 ft^2 in a few streaks or open patches when you seed the buffalograss. Seed can also be sown in pots and transplanted.

Western wheatgrass (*Agropyron smithii*) is an important cool-season mid-grass in shortgrass prairie. It is the dominant grass in the Western Wheatgrass Mixed Prairie. It may grow dense enough to exclude nearly all other species. Its close relative, quackgrass, is a vigorous and noxious lawn and garden weed which will be familiar to many people. Spreading by rhizomes, western wheatgrass, like quackgrass, is very invasive.

As a cool-season grass, western wheatgrass begins growth when warm-season species are still dormant. In dry years, it may consume all available soil moisture before warm-season species begin growth. During the 1930's

drought, it replaced huge areas of tallgrass prairie by beginning growth early and consuming all winter moisture. With all available moisture consumed by wheatgrass, none remained during summer drought for warm-season species like big bluestem (*Andropogon gerardii*) and Indian grass (*Sorghastrum nutans*).

Wheatgrass grows poorly during hot weather. With moisture at this time, warm-season species can compete. Its growth is also retarded by fire when warm-season plants are dormant.

Due to its vigor and invasiveness, I recommend avoiding western wheatgrass in prairie plantings smaller than several acres - at least initially.

Other common grasses in shortgrass prairie include galleta (*Hilaria jamesii*), alkali sacaton (*Sporobolus airoides*), and needle-and-thread (*Stipa comata*). Needle-and-thread is a cool-season mid-grass and it has sharp, penetrating seeds.

Watering

Most seedlings of perennial prairie species succumb to drought. The degree of revegetative success on bare soil is probably determined more by rainfall than anything else. Without above average rainfall for several years, plant establishment is poor.

Although we are planting drought-tolerant species, their successful establishment requires above average rainfall which we must supply by watering. Establishing a good cover of blue grama and buffalograss requires the same watering as a bluegrass lawn.

Prairie grass seed must be kept constantly moist for the first three weeks. This may require watering several times per day, especially during hot, windy weather. After three weeks watering can be reduce to every two or three days. Avoid water stress as indicated by in-rolled leaves and a grey appearance, or wilting. Eventually reduce watering to one deep watering per week to promote a deep root system and good drought resistance.



If your grass doesn't seem to be growing very fast, don't worry. Prairie species devote their energy to establishing a good root system before putting energy into top growth. Next year these roots will allow abundant top-growth. Try not to mow the grass while it is growing during the first year. It is the leaves that are the food factory for developing roots.

Weeding

With grasses at the 3 to 4 leaf stage, the prairie garden can be walked upon for hand weeding. Moistening the soil first may be necessary in order to pull weeds without also pulling up chunks of soil and grass. Large weeds are best cut off below soil level with a sharp knife. Water after hand weeding to resettle loosened plants.

If hand weeding appears hopeless, mowing at the height of the grass will reduce weed competition. Prostrate species such as knotweed (*Polygonum aviculare*) and portulaca (*Portulaca oleracea*) are little affected by mowing. Both will smother large areas of grass if not controlled.

When physical control of weeds is impossible, 2,4-D containing herbicides such as Weed-Be-Gone can be sprayed very lightly when grass plants have three or more leaves. Use extreme care NOT to spray to the point of run-off. This is mainly effective against weed seedlings and will have little impact on larger plants of knotweed, portulaca, mallow (*Malva neglecta*), bindweed (*Convolvulus arvensis*), or thistle (*Cirsium* sp.). Bindweed and thistle can be controlled by Roundup®, with the realization that you will have bare spots where you spray. Protect grasses with newspaper as much as possible when using Roundup®. Do not let bindweed grow uncontrolled even if you can only pull it by hand, it's better than nothing. Don't use herbicides containing Banvel or Dicamba because of their persistence in the soil.

Above all, look forward to next year when, believe it or not, most of the annual weeds will disappear and the grasses will flourish in your beginning prairie. ♣

Calendar Overview

Additional information about calendar items will be found throughout this issue.

1990 Field Trips

September 1 — **South Park**

Leader: David Cooper

September 8th, Annual Meeting
Exotic Plants of Colorado
Estes Park, YMCA of the Rockies

Workshops for '90 - '91

November 3 — **Phlox Family**

Leader: Dr. Dieter Wilken

December 8 — **Willows**

Leader: Dr. David Cooper

January 12 — **Eastern CO Grasses**

Leader: Dr. Alan Carpenter

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