

Winter, 2013

The Bulb Garden



~Gardening with Bulbs ~

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California Adventures: Mountain Bulbs in the Grandeur of Yosemite

Nhu Nguyen

Nhu, the current president of PBS, is a mycologist who also loves plants and combines that passion with travel and photography. He is a graduate student at UC Berkeley and is also a painter. View his work on the Web at www.flickr.com/photos/xeranthem.—Ed.

Anyone who had ever visited Yosemite National Park, a World Heritage Site, will immediately find the words of

In so few words, he fully expressed the wonders and amazing nature that can be found in the park. The plant and animal life are intricately interwoven, and the bountiful mountains of granitic rock create a feeling of grandeur and grant the beholder a sense of awe and continual amazement at every turn of the road.

The park is one of my most favorite places in the world. It is a vast area covering 1,169 square mountainous miles (3,080 square km) in the central Sierra

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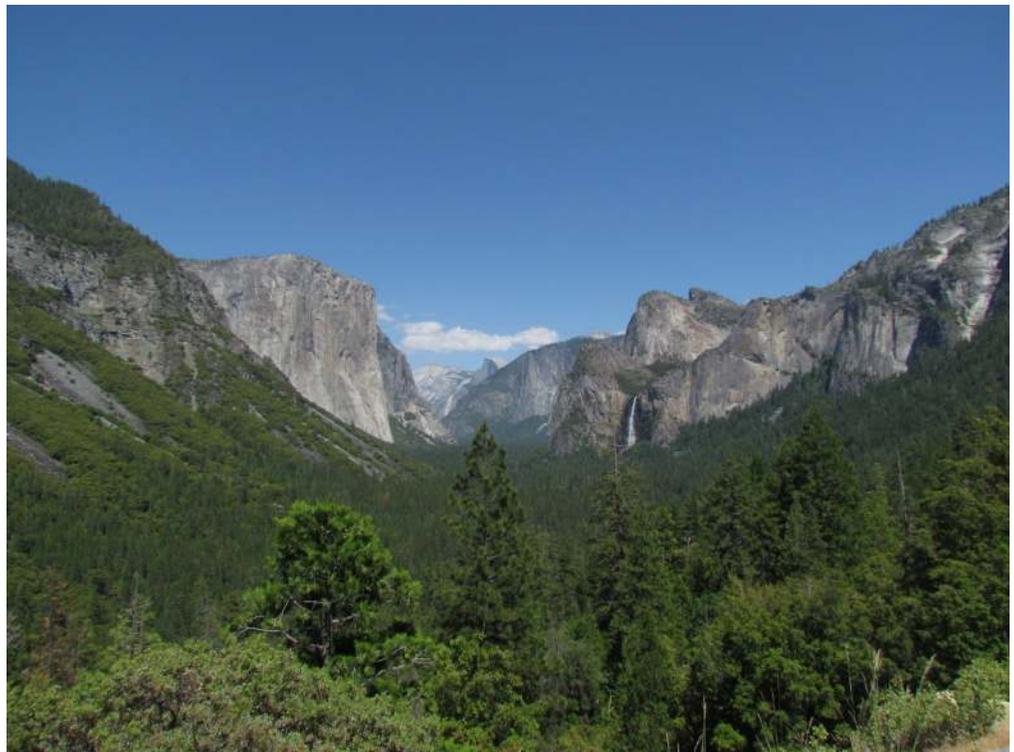
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John Muir* inspiring—“It is by far the grandest of all the special *temples of Nature* I was ever permitted to enter.”

Nevada range of California. In 1864 President Abraham Lincoln declared
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*John Muir (1838–1914), the great Scottish-American naturalist, preservationist, and writer. He lived in Yosemite National Park for several years observing and writing about everything that nature had to offer.

California Adventures (cont'd)

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Yosemite Valley and the Mariposa Grove of Giant Sequoia the first public trust in California, paving the way for the national parks system. In 1890 Yosemite became one of the first national parks in the United States. Ever since, it has become a gathering place for people with varied interests from rock climbing to photography, hiking, camping, and of course botanizing. The park is home to 20 percent of California's 7,000 plant species, and among them are a handful of geophytes, some of which I will highlight here.

The geophytes of Yosemite can be put into two basic categories, the first occurring on open, dry slopes of decayed granite or nutrient-poor soils, and the second found in the sunny to slightly shaded, humus-rich, sopping wet meadows and streams. One of the best and most accessible places to see these geophytes is on Tioga Pass Road. This route

traverses many habitats and thus allows the best chance to see the most diversity. It starts from about 6,000 ft. (1,800 m) at Crane Flat and peaks at 10,000 ft. (3,000 m) at Tioga Pass. From there, it descends steeply down the Eastern

Sierras into the Great Basin, a high-altitude desert (~6,000 ft., 2,100 m) that covers a huge portion of the American West.

Within the park, dry hillsides of decayed granite support geophytes such as *Allium campanulatum*, *A. obtusum*, *Calochortus leichtlinii*, *Cistanthe (Calyptridium) umbellata*, *Iris missouriensis*, and *Triteleia montana*. These plants might grow in full sun, but sometimes they seek out slight shade from other plants or rocks.

Allium campanulatum can be found in both sun and partly covered areas. The forms growing in more sun tend to be more saturated in color. *A. obtusum* is a cute little onion with tiny flowers. It grows in an open space with a sparse covering of conifers above. Clumps of *Calochortus leichtlinii* are spectacularly

beautiful in open areas. They seek out the shade and protection from other plants, and those that grow in open decayed granite are short and charming. They can also be found growing on shaded slopes, but the plants tend to be taller. *Cistanthe umbellata* can also grow in both dry and moister areas. It is widespread and is so variable that the leaves can blend in perfectly with the surrounding soils and rocks. The flowers range from pallid pink to lovely cerise.

Look for *Iris missouriensis* growing in more open areas underneath the many coniferous trees in the park. And *Triteleia montana* is very widespread, but the flowers are small and often cannot be seen from the car. During their blooming period, park anywhere and, with a short walk, you should be able to spot them without too much effort. However, watch your feet because with each step you take you might be trodding on many dozens of the tiniest blue *Collinsia*.

Moist meadows and streams provide water for various geo-

phytes such as *Allium validum*, *Triteleia ixioides*, *T. montana*, *Calochortus minimus*, *Veratrum californicum*, *Camassia quamash*, and *Dodeca-*

theon alpinum.

Because of the high altitudes (6,000 to 10,000 ft./1,800 to 3,000 m) where these plants grow, some will start blooming only in late June and some as late as August. *Allium validum* is the largest of the Californian onions and can grow as tall as 3 ft. (1 m). It blooms in late July and in August and can be found in flowing streams and open wet meadows. *Veratrum californicum* has the same late-blooming schedule. However, for me, the semi-mature leaves are the most intriguing aspect of this species. They often form sculptural cups, which can be partly glaucous, but are leathery to the touch despite their fragile appearance.

Although *Triteleia montana* can be found in dry areas, I have seen it flourishing in moist but well-drained meadows. Sometimes it grows with *T. ixioides*. *Calochortus minimus*, true to its name, is a tiny

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California Adventures (cont'd)

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plant that likes moist meadow edges in filtered sunlight. The flowers are white, sometimes greenish. It can be found in drier, more humus-rich areas as well. And last but not least for the geophytes are *Camassia quamash* and *Dodecatheon alpinum*. Look for these plants in the moistest part of pretty much every meadow you come across.

There is a plant that grows in the park (and elsewhere in high-altitude mountains) that is not a true geophyte, but it certainly deserves honorary geophyte status. That plant is the spectacular *Sarcodes sanguinea*, or snowdrop. A fully mature and healthy plant in bloom rivals the most

spectacular desert *Haemanthus* of South Africa. The red overlapping bracts of the inflorescence appear in spring as the snow melts and the inflorescence slowly elongates into a scape with some of the most sanguine red and succulent flowers in the plant kingdom. Each plant might consist of just one scape, but a very happy plant can have a dozen scapes. The flowers are pollinated by hummingbirds, bees, and butterflies. Its haunting beauty can be matched only by its absolutely fascinating biology. It is fully nonphotosyn-

thetic and lives most of the year underground, appearing above ground only in flower form. For a number of years, the plant was thought to be saprotrophic, feeding off the detritus in the soil. However, we now know that it associates with mycorrhizal fungi of the genus *Rhizopogon* and acts as a fungal parasite.

Mycorrhizal fungi are those fungi that associate mutually with roots of trees, mostly of the pine and oak family. They make their living by exchanging mineral nu-

trients (N, P) in the soil for photosynthetic carbon from their plant counterparts. Without this association, many conifers could not live in the nutrient-poor places that they do. The mycorrhizal fungi attach themselves to the root-ball of the snowdrop and also to the roots of the trees. However, snowdrops have developed some undiscovered mechanism where the nutrient flows only one way toward the snowdrop. Thus, we consider this a parasite on a fungus.

Sarcodes sanguinea can be seen only in spring after the snow had melted in high-altitude areas from 6,000 to more than 10,000 ft. After a short period of blooming, the inflorescence will turn a maroon red and fade into seeds.

The seeds get dispersed to a different area where they will need to be in contact with the host fungus before they can germinate. Even though the upper part of the plant dries out, the rest of the plant continues to grow and develop underneath the soil.

Snowdrops can be spotted along Yosemite's roads, but they tend to be short-lived where they occur. This is due to the fire-adapted biology of their host fungi. After a fire,

the fungus becomes very successful and seeds of the plant will germinate and grow. Several years after a fire, the fully mature plants will put up a wonderful display for another few years until their host fungi are outcompeted by

other fungi and both partners disappear almost altogether.

From the dry, decayed granite outcrops, to sopping wet meadows, to the melting snow of recently burned forest, geophytes and other plants, no matter how ephemeral they are, speak to the diversity and beauty of the plant life in Yosemite National Park. A pilgrimage is an absolute must for anyone who wishes to be enchanted and awed by this very special temple of Nature.



Facing page, clockwise from top left: *Allium campanulatum*, *Triteleia ixioides*, and *Camassia quamash*. This page, clockwise from top left: *Sarcodes sanguinea* just breaking through the soil, *Calochortus leichtlinii*, *Sarcodes sanguinea* in bloom. Photos by Nhu Nguyen.

Mapping the World's Summer-Dry Climates

Mike Mace

Mike is one of the volunteer administrators of the PBS wiki. He lives in San Jose, California, where he gardens on a half-acre hillside of heavy, rocky clay infested with gophers, two feral cats, and a couple of near-sighted Boston terriers.—Ed.

Does this situation sound familiar? You pot two different species of “mediterranean climate” bulbs and give them both the same careful treatment, keeping them dry in summer and not too cold in winter. One species thrives, while the other struggles and dies. What went wrong? If you're like me, you shrug your shoulders and call the dead species “difficult.” But often, I think, the real problem is that we just haven't understood what particular *type* of mediterranean conditions the dead bulb needed.

The term “mediterranean climate” is confusing because it implies that there's one uniform mediterranean climate around the world. There isn't. The “mediterranean” weather in parts of Italy has ten times more summer rain than “mediterranean” southern California. The same variation happens with winter cold—parts of mediterranean South Africa barely get any frost at all, while frost and even hard freezes are common in much of mediterranean Chile and California.

The more closely you look at the world's mediterranean climates, the more different they appear.

We need a way to compare those climates, with enough details to help us guess at the exact treatment a particular bulb needs. Several years ago I posted to the wiki a first draft of some maps comparing the various mediterranean climates, building on the wonderful climate graphs that had been posted by Lee Poulsen. Your feedback showed that the maps needed to be expanded and restructured. I've been revising the maps ever since. This article describes the results, and I'd love to get your feedback.

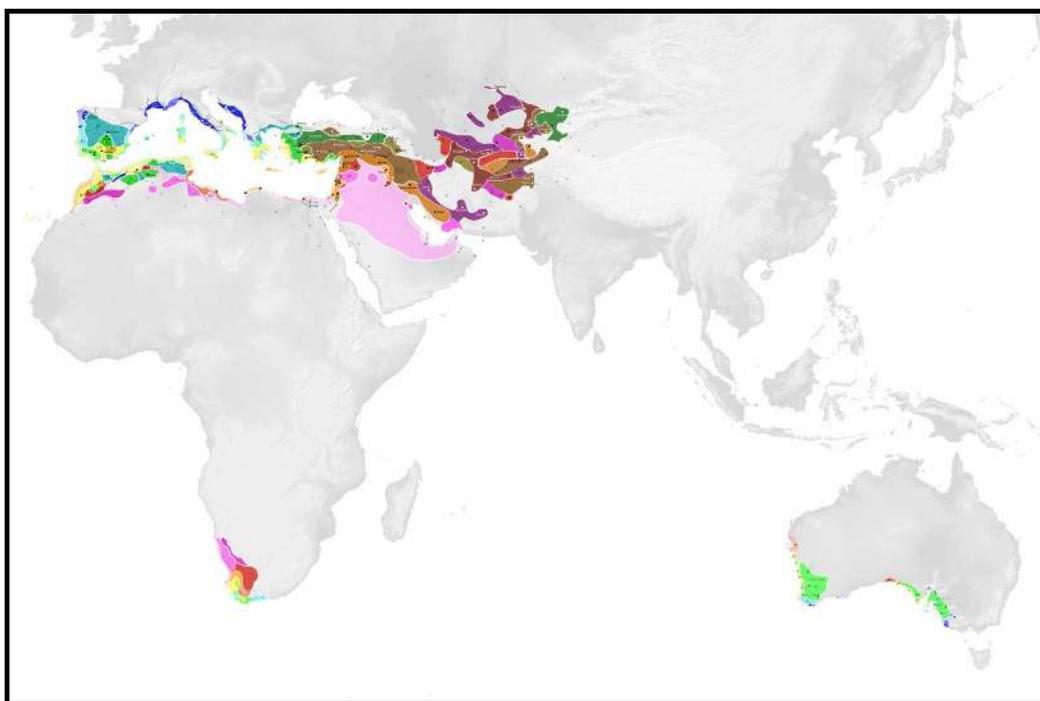
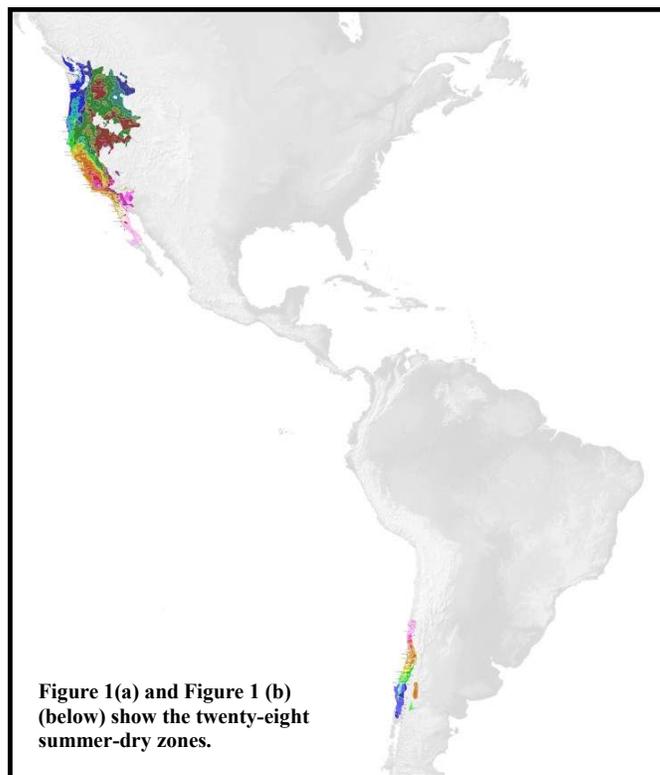
Comparing the mediterranean climates of the world

Two of the biggest variations among the world's summer-dry climates are the severity of the drought an area experiences in summer

and the amount of cold it gets in winter.

Let's start with **winter cold** first. Although temperatures can vary infinitely, there are four basic situations you can be in relative to winter cold. I turned those into four “zones”:

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Mapping (cont'd)

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Zone 4: No frost. The bulb almost never sees freezing temperatures.

Zone 3: Light frost. The bulb experiences light frost in some winter nights, but almost never an extended freeze.

Zone 2: Heavy frost. The bulb regularly gets frost in the winter and occasionally experiences a serious freeze (in which the surface of the soil gets hard).

Zone 1: Frozen. The soil surface regularly stays frozen in winter, often with snow cover. Most bulbs native to this climate are dormant or near-dormant in mid-winter, growing in the spring.

(Note that these are zone numbers *I* assigned, not to be confused with the USDA climate zones.)

Bulbs from Zone 4 may be damaged in light frost zones and can be killed in colder areas if not protected. Bulbs native to Zone 1 may need winter refrigeration if grown in warmer areas.

Rainfall is even more variable. Here's an example: San Diego, California, home to some very handsome native bulbs, typically gets five to six months every summer with virtually no rain at all. Hermanus, South Africa, also a notable bulb center, normally gets a four-month dry spell in summer, and even in that dry period averages at least half an inch (17 mm) of rain per month. Four months of dryness versus six; half an inch of water a month versus no water at all. Whether you're growing bulbs in pots or in the ground, those are very different conditions.

To account for all the variations in rainfall, I made up seven winter rainfall zones. Zones A and B are deserts (less than 10 inches, 25 cm, of rain per year), with most of their rain falling in the winter. Zones C and D

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Book Review: *Fall and Winter Bloom in the Solar Greenhouse*

Fall and Winter Bloom in the Solar Greenhouse, by James L. Jones. Published by the author, 2012. Paperback, 153 pages, color photos throughout. ISBN 9781470015664. \$35 from amazon.com.

Reviewed by Jane McGary, Portland, Oregon

Those who grow bulbs in cold climates are often attracted to this specialty because of the extended flowering season that can be achieved by cultivating the plants in containers with a modicum of protection against the weather. PBS member Jim Jones began with an alpine house—he was president of the North American Rock Garden Society in 1999—and later added an attached solar greenhouse to his residence. He calls it a “sunhouse” because he grows his plants through the Massachusetts winter with almost no added heat source. In the coldest months, a layer of bubble insulation applied to the glazing protects the plants, and the design of the sunhouse incorporates heat storage in the form of containers of water, heated by the sun during the day. A few plants, he admits, need some help in the form of a heat mat, but most of the hundreds of species he cultivates thrive without that.

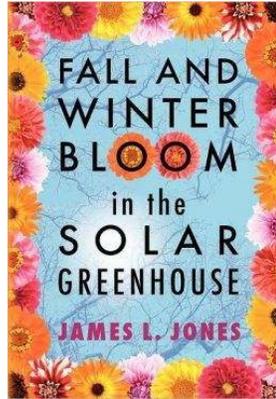
The first four chapters describe the design and operation of the sunhouse and some growing and propagation techniques. The rest of the book, beginning on page 59, comprises descriptions of the plants grown. Many of them will be familiar to Californian readers as garden subjects, but in my experience at least, few of those described will survive temperatures below about 25°F (-3.8°C). The geophyte genera discussed include *Babiana*, *Chasmanthe*, *Clivia*, *Cyclamen*, *Cyrtanthus*, *Daubenya*, *Freesia*, *Galaxia*, *Gladiolus*, *Ixia*, *Lachenalia*, *Lycoris*, *Massonia*, *Moraea*, *Narcis-*

sus, *Nerine*, *Oxalis*, *Pelargonium*, *Polyxena*, *Rhodophiala*, *Romulea*, *Tritonia*, and *Veltheimia*. Other favorite groups are gesneriads, many kinds of succulents, and the hardier subtropical orchids. Jones provides useful information on pot cultivation for most of the plants, and he notes which plants died, which makes him more honest than most such authors.

The text is clearly written, to the point and without affectation. Numerous photos are provided, but many suffer either from an original lack of quality or from the “print on demand” process that produces the book. The paper stock is uncoated, which reduc-

es photo quality to begin with, and the color balance on the majority of the photos is off, with excessive black. I doubt that the author had the opportunity to request correction. It is sometimes difficult to ascertain what plant appears in a photo. Captions are lacking, and those available are not always immediately adjacent to the pertinent text.

This book should be helpful to anyone in a colder climate who wants to enjoy flowers through the winter at moderate expense, once the construction is paid for. The initial chapters should both inspire growers and help them avoid errors, thanks to Jones's experienced advice. Others may have different results with the same plants, though; for instance, he finds *Narcissus* species of section *Bulbocodium* short-lived, while mine, growing in colder conditions than his sunhouse, have survived for decades. Finally, the \$35 price (from amazon.com) seems high for a cheaply bound paperback, especially considering the poor job the printer has done with the photos. If a revised edition is ever contemplated, a little help from a designer would go a long way toward fixing the problems with color, photo placement, and missing captions.



Mapping the World's Summer-Dry Climates (cont'd)

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have relatively long summer droughts with very little summer rain in an average year. Zones E, F, and G have shorter summer droughts, with some summer rain.

Combine the four cold temperature zones with the seven rainfall zones, and you get a total of twenty-eight summer-dry zones. Because we've included deserts and areas with cold winters, the zones extend beyond the traditional mediterranean areas of the world, as you can see in *Figure 1(a)* and *Figure 1(b)*.

A climatologist would probably be annoyed, but this broader set of zones corresponds much better to the world's summer-dry bulb climates.

Figure 2 is a chart of the zones, with the names of prominent cities added. I gave each of the zones its own letter and number code, so we could refer to them easily. I put the letter first (C2, B3, etc.) so the bulb zones wouldn't be confused with the USDA climate zones, which use a number followed by a letter (e.g., zone 9b). I don't know if anyone other than me will want to use the zone codes, but in my bulb collection I'm putting the zones on labels so I can group bulbs that need similar treatment.

“normal” water, grows in USDA zones 9–10, prefers loam soil, and should be kept in a greenhouse where not hardy. The information is so generalized that it's very close to meaningless.

Here's what you can do with the climate zones. Looking at the chart, I see that Clanwilliam is in Zone C4, the same zone as Casablanca and Los Angeles. Now all of a sudden I know a lot. I've never been to Clanwilliam (or Casablanca), but I know the climate in Los Angeles very well. It gets about the same rainfall as San Jose (where I live), but is a bit warmer in

		G. Wetter (two months <2in/5.1cm precip, driest month <1/4 wettest month)	F. Wet (two months <.9in/2.3cm precip)	E. Moist (Three months < .9in/2.3cm precip)
Coldest Winter Month	4. Temperate (Lows avg. 45-60F / 7-15C)	G4 Esperance, Au. Messina, Italy	F4 Adelaide Valencia, Spain Point Arena, Ca. Hout Bay, SA	E4 Perth Lisbon Cape Town
	3. Cool (Lows average 40-45F / 4-7C)	G3 Naples Perpignan, France Mt. Gambier, Au. Temuco, Chile	F3 Athens Still Bay, SA Point Reyes, Ca.	E3 Algiers Southern Cross, Au. Stellenbosch, SA Eureka, Calif.
	2. Cold (Lows average 30-40F / -1-4C)	G2 Colipulli, Chile Rome Seattle	F2 Madrid Eugene, Oregon	E2 Istanbul Grants Pass, Oregon Talca, Chile
	1. Frigid (Lows average <30F / -1C)	G1 Sandpoint, Idaho	F1 Pullman, Wash.	E1 Yosemite, Calif. Ankara, Turkey

Using the zones to help you grow bulbs

I added cities to the chart because that can help you get an intuitive feel for the way the zones work. Let me give you an example. *Sparaxis metlerkampiae* grows near Clanwilliam, South Africa. It's a cute little purple-flowered bulb that you might want to add to your collection. But how to grow it? Searching online, the only information I can find is that it needs

winter. So I can give *Sparaxis metlerkampiae* the same watering I use for bulbs that are native to my area, but a bit more protection from cold.

Let's do one more example. *Moraea lurida* is native to the area between Caledon and Hermanus in South Africa. You can't see it on the map we've reproduced here, but in the wiki there's a higher-resolution

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Mapping (cont'd)

(continued from previous page) map showing that area is in Zone E3, which the chart shows is roughly equivalent to Eureka, California. That was a big surprise to me. Eureka is on the northern coast of California, in an area so damp that most Californians would tell you it's not even mediterranean. So the map says that, if I want to grow *Moraea lurida* at my house, I have to start watering it in late sum-

mer-dry region. Besides, soil varies so much from spot to spot that it would be very hard to show on maps at this scale. Some people asked that the maps include summer high temperatures. Because summer highs are not included, the maps currently show some odd things. For example, Rome and Seattle are in the same zone. That makes sense if you look at winter cold and rainfall patterns, but obviously Rome is a lot warmer than Seattle in the summer. Unfortunately, adding summer highs would have tripled the number of zones, making the maps pretty much unreadable because the colors would all blend together (I tried and gave up). Besides, summer high temperatures don't strongly affect summer-dormant bulbs. Summer temperatures are very important for growing perennials, but bulbs are dormant underground in the summer, so they stay relatively cool no matter what the temperature is at the surface. For our purpose, the maps work well without summer highs.

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To view higher-resolution versions of the chart and maps, you can look on the PBS wiki at: <http://www.pacificbulbsociety.org/pbswiki/index.php/Climate>. In part 2 of this article, we'll discuss the specifics of the climate in each summer-dry part of the world. Meanwhile, I'd welcome your comments and suggestions. You can reach me at mikemace@att.net.

Summer Rainfall

D. Damp (three months <.5in/1.25cm precip)	C. Dry (three months <.25in/.6cm precip)	B. Moderate desert (6-10 inches/15-25cm total rain per year, almost all in winter)	A. Extreme desert (2-6 inches/5-15 cm total rain per year, almost all in winter)
D4 Tunis Geraldton, Au. Hopefield, SA	C4 Los Angeles Casablanca Valparaiso, Chile Clanwilliam, SA	B4 Alexandria Saldanha, SA Lazaro Cardenas, MX Illapel, Chile	A4 Guerrero Negro, MX La Serena, Chile Port Nolloth, SA
D3 Mendocino, Calif. Constitucion, Chile Caledon, SA Izmir, Turkey	C3 Santiago Jerusalem San Luis Obispo, Calif.	B3 Riverside, Calif. Worcester, SA Salamanca, Chile Misratah, Libya	A3 Havasu City, Ariz. Ovalle, Chile Vanrhynsdorp, SA
D2 Ceres, SA Red Bluff, Calif. Manisa, Turkey	C2 Sacramento, CA Amman Rancagua, Chile	B2 Rancagua, Chile Nieuwodtville, SA Palmdale, Calif. Tehran	A2 Bakersfield, Calif. Semnan, Iran Springbok, SA
D1 Bend, Oregon Tabriz, Iran	C1 King's Canyon, Ca. Kabul, Afghanistan	B1 Reno, Nevada Ashgabat, Turkmenistan	A1 Victorville, CA Isfahan, Iran

mer (about two months before the rains start) and keep it moist through the end of spring. And sure enough, it responds very well to that treatment.

Here are a couple of other interesting city pairings: *Tehran, Iran; Palmdale, California; Rancagua, Chile; and Nieuwodtville, South Afri-*

cold enough to be in this climate zone.

What's missing from the zones

It would be nice to have information on soil types, but I haven't been able to find comprehensive maps of the soil types in every sum-

www.pacificbulbsociety.org/pbswiki/index.php/Climate.

In part 2 of this article, we'll discuss the specifics of the climate in each summer-dry part of the world. Meanwhile, I'd welcome your comments and suggestions. You can reach me at mikemace@att.net.



Naturalizing Bulbs in Turf

Jane McGary

Jane is a past president of PBS and gardens in Milwaukie, Oregon, near Portland. She is interested in rock gardens as well as bulbs grown in cold frames.—Ed.

A meadow studded with flowering bulbs has been a subject of European art since late medieval times at least, as we see in the famous *Hunt of the Unicorn* tapestries in the collection of New York's Metropolitan Museum of Art. The motif, known as *champ fleury* ("flowery mead"), was also a favorite of the backward-looking Pre-Raphaelite School of the nineteenth century. Any gardener who sees these images is likely to want to imitate them. But is it really possible?

The English garden designer and writer Christopher Lloyd described at length the flowering meadow at Great Dixter, but it's important

to know that this meadow, like those in the Swiss Alps, was mown or grazed on a carefully timed schedule to control the vigor of the grasses and allow the bulbs and perennials to complete as much as possible of their life cycle. Annual meadows are a great feature of North America's Pacific coast, but I recall an article in *Sunset* magazine about imitating them in the home garden, where the writer admitted that the space devoted to this display had to be herbicided at intervals to control the grasses and coarse

weeds that would otherwise dominate it quickly.

Even though I came to regard the meadow garden as one of the great myths of garden designers and writers, I couldn't resist trying several versions of it over the years. Sowing annuals in disturbed soil in an Oregon pasture worked for two years, and after that nothing but California poppies and *Gilia capitata* (the latter is native here) survived. In my former garden there is a little round lawn on one of the terraces, and I considered it next. I planted a few hundred crocus corms there, mostly se-



Jane reports some success naturalizing *Crocus tommasinianus* because its leaves tend to grow horizontally to the ground, as you can see in Dell Sherk's photo of *C. tommasinianus* (left; this sport boasts extra petals). She had less success with *C. vernus* because the leaves grow vertically (as exemplified in the photo of *C. vernus* ssp. *vernus*, right), making them fodder for the lawnmower. Photo by Jane McGary.

lect varieties of *Crocus tommasinianus*, because I had seen it naturalized in many Portland lawns. It turned out very well, and I found that one reason this is such a good species for naturalizing is that its leaves tend to lie horizontally more than vertically, so that one can mow the grass in spring without harming it. Dutch crocuses (large forms of *C. vernus*) are often naturalized in grass, but their coarse vertical foliage will be damaged by mowing. That garden is plagued by voles, which eat crocus corms, but they didn't bother those

in the lawn. I suspect the dense grass roots deterred their burrowing.

The bulb frames at my former place were out in a field of perennial grasses and weeds, and after a few years seedling crocuses began to appear despite the density and coarseness of the grass. Ants probably dispersed the seeds. *Crocus kotschyanus* was one, and *C. pulchellus* another. The latter also spread into a mown lawn in front of the house. These are both fall bloomers.



In a mediterranean climate, fall-blooming crocuses and other bulbs are excellent choices for growing in lawns or more naturalistic grassy areas because they flower before the grasses make their winter growth. In the fields of Greece

and Turkey one sees such species as *Crocus goulimyi*, *C. boryi*, *C. niveus*, *C. hadriaticus*, and even the cherished *C. mathewii* blooming in grass, often in spaces where sheep have grazed earlier in the year, leaving the turf very short. *Sternbergia lutea* and *S. sicula* also grow in grass.

In my new garden I planned a bulb lawn from the beginning. I started with an area that had been torn up by trucks bringing in building materials and soil amendments. I sprayed it with Roundup and later

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Board of Directors Meeting, January 2013

Your PBS board members met on January 27, 2013, via teleconference with everyone present. We began with one of our most pleasant duties: we welcomed our new secretary, Kathryn Andersen! We're so glad that Kathryn has decided to join us.

Treasurer Arnold Trachtenberg presented our latest P&L statement (see report, this page). The funds invested in a money market account and a muni fund, with some cash on hand. He reiterated what we all know: the BX really does fund all of our PBS activities! He also noted that there has been a relatively small increase in the cost of printing. Finally, he indicated that he would soon be sending out reminder notices to PBSers whose membership has lapsed. If you haven't already done so, please renew your membership today!

Vice President John Wickham has been working very hard amending our bylaws in preparation for incorporation. Our long-time members know that this has been a goal for quite some time, and we are so grateful to John for taking on this challenge! We discussed most of the Articles in this meeting, paying special attention to the language describing the configuration of the board. We agreed that officers (President, Vice President, Treasurer, and Secretary) as well as directors (membership, BX, web, and publications) should all be entitled to vote during board meetings. We discussed election policies and debated whether terms should be staggered. Finally, we agreed that we need to make sure that each position has a detailed description, and one of our future tasks will be to compile a "Policies and Procedures" manual.

Presently, the bylaws call for a countersignature on all checks above \$500. Arnold pointed out that the only checks above that amount are for our publication, and we decided to remove that requirement from the bylaws. Instead, policies regarding check writing and maximum amounts that the Treasurer can approve autonomously will be detailed in the "Policies and Procedures" manual.

With the discussion of the by-laws complete for the present, we turned to other business. We approved a \$250 donation to Ibiblio (the non-profit website that hosts our wiki free of charge). President Nhu Nguyen questioned whether we should have a Facebook presence. We discussed it at this meeting and continued the discussion via emails, finally deciding to ask Nhu to establish a page that would serve as a brief source of information about us while ultimately referring interested parties to our wiki.

As always, we are happy to hear from our members with questions or suggestions. Feel free to contact board members using their email addresses found on page 1!



Please take a moment to
renew your membership in PBS!
Pay via PayPal at pbstreasury@verizon.net.

Treasurer's Report, Year End 2012

BALANCE 1/1/2012	\$19,865.43
U.S. Members	\$3,640.00
Overseas Members	\$2,400.00
Contributions	\$117.00
BX Receipts	\$9,656.85
Investment Results	\$1,284.02
Grow Bulbs	\$2,430.00
TOTAL INCOME	\$19,527.87
BX/SX Expense	(\$3,245.83)
Board Conference Calls	(\$274.77)
Supplies	(\$316.05)
Total Publications	(\$3,439.55)
PayPal Expense	(\$804.97)
Postage	(\$2,956.60)
Secretary Expense	(\$79.75)
Grow Bulbs	(\$2,199.28)
TOTAL EXPENSES	(\$14,083.02)
BALANCE 12/31/2012	\$26,076.50

Mary Sue Ittner

has made so many contributions to PBS! In addition to managing our listserv, she created our wiki, which is the best geophytic resource on the web!

Mary Sue has decided to retire from her role overseeing these valuable resources, but she leaves us in very good



hands, having trained a team of experts.

**THANK YOU
SO MUCH
to Mary Sue
for her
dedication
to PBS!**

Naturalizing Bulbs in Turf (cont'd)

(continued from page eight)

tilled it. I had a pile of sod that had been stripped off to make perennial and shrub beds, so I decided to lay it on the bare area, although it wasn't the deep, lush product obtained from sod farms. I had baskets of miscellaneous bulbs I had rescued from the plunge sand in the bulb frames, and I literally threw them down, along with about 400 *Crocus tommasinianus* 'Whitwell Purple' and some mixed lavender and white Dutch crocuses, and laid the sod over them. A few weeks later I went to the old garden and dug up a hundred or so bulbs of *Narcissus obvallaris* from a low-lying area where they were naturalized in dense grass and had increased greatly, and planted them in the new bulb lawn too.

Two springs have passed since then, and the bulb lawn is a joy, from the purple crocuses in March to the bright yellow daffodils that flower through

April. After that it is not such a joy, because I have to leave it unmown until the daffodils ripen their foliage in mid-June. However, three gigantic Douglas firs overshadow the area, keeping the grass a bit under control with their wide-spreading roots, and I let the grass go dormant in summer so that it's very short when fall comes with its coolness and rain.

What pops up from my random baskets of bulbs

is always a nice surprise. The first flower in fall is *Acis autumnalis* (formerly *Leucojum autumnale*), which can be rather weedy in gardens here. There are some small-to-medium *Colchicum* species, notably *C. boissieri*, which spreads rapidly by horizontally extending corms. Then come the crocuses, mostly *C. kotschyanus* with a sprinkling of *C. boryi* and *C. hadriaticus*. *C. pallasii* appeared this fall. I may try *C. goulimyi* too; it wasn't hardy in my other garden but it's warmer here. In spring several *Fritillaria* species showed up, including

the western American *F. affinis* and *F. biflora* and Mediterranean *F. messanensis*, which I photographed on a grassy terrace on Crete. Some of the low-growing *Ornithogalum* species got in and flower prettily just at ground level; they're not as invasive as the Star of Bethlehem, *O. umbellatum*, which can be seen naturalized in many parts of North America. A taller "thog" that likes the turf is *O. nutans* with its curiously beautiful, nodding gray-and-

white bells. Some of the little *Narcissus* species, more likely to be seen in rocky places in nature, are happy here, including *N. calcicola* and *N. rupicola*. Even *N. cantabricus* made a brave appearance. (The usual little narcissus for naturalizing in grass is *N. bulbocodium*, the Hoop Petticoat daffodil, and I'll add some of those; subsp *obesus* has lax foliage that would escape the

(continued to next page)



Some of the flowers that appear in Jane's "random basket of bulbs." Center: *Fritillaria messanensis*, photo by Mary Sue Ittner. Clockwise from top left: *Colchicum boissieri*, photo by Jane McGary; *Acis autumnalis*, photo by Bob Rutemoeller; *Narcissus cantabricus*, photo by Jane McGary; and *Fritillaria affinis*, photo by Jane McGary.

Naturalizing Bulbs in Turf (cont'd)

(continued from previous page)

mower.) Eventually, too, there will be *Cyclamen hederifolium*, which I planted under the Douglas firs; in this area it often turns up in lawns, its seeds spread by ants.

All these species are short enough to look natural in short grass. If you have an area of taller, perennial grass, you might want to plant some of the western American bulbs in the Themidaceae—taller species of *Dichelostemma*, *Brodiaea*, and *Triteleia*. Grassy meadows, dry in summer, are their natural habitat. All are very easy to raise from seed. Rather than growing them in grass, I've planted

mine in a chaparral type of shrub garden atop a dry slope. The summer-dry meadow is also the natural home of many *Calochortus* species, though none of them has been planted out here because I think the

rainy season is just too long for them to tolerate. *Colchicum* has many species that grow naturally in grass, and if you leave the grass high their spring-growing leaves will not be obtrusive. In a shady spot, try *Arum* species.

Here are some hints about developing a bulb lawn. First, choose an area where the grass doesn't grow very well—perhaps where the soil is naturally poor or there are greedy tree roots. This will keep the grass from out-competing the bulbs, though as mentioned above, some crocuses grew in very dense pasture for me. If you want to make a big planting, it's worth hiring a landscaper to lift the sod with a machine; leave the strips of sod in place and just flip them over and back as you place the bulbs under them. If you do this at the right time of year, when the grass is about to make its main growth spurt, it won't die. Otherwise, the best planting tool is a geologist's trowel, a long, narrow, very sturdy implement that you can stab into the turf, or even pound it in with a rubber mallet, rock it a little to open a planting hole, and drop in your bulb. Large-scale naturalistic planting of bulbs can also be done by two people working together, one opening planting holes with a small spade and the other crawling along placing the



For lawns with tall grasses, Jane suggests the taller species of *Dichelostemma*, *Brodiaea*, and *Triteleia*. Above, a black Pipevine Swallowtail pollinates *Triteleia laxa* near Vina, CA. Photo by Bob Rutemoeller. Right: *Dichelostemma capitatum* flourishes at the Stebbins Cold Canyon Reserve. Photo by Nhu Nguyen.

bulbs.

One thing the garden designers get right about bulb lawns is the principle of planting in drifts of single species or varieties. You can toss out handfuls of one variety and just plant them where they fall to get a pleasing distribution. In my bulb lawn, the crocuses are mostly through the middle and lower edge of the area, and the narcissus in groups higher up the slope. This allows me to mow the lower part, near the road, earlier in the spring.

What you choose to plant will depend on your climate, but it's best to research the choices and concentrate on those that grow naturally in grassy habitats. Most good reference books include habitat information. My experience is strictly with summer-dormant bulbs, except for the genera I grow in irrigated perennial borders. Start with inexpensive kinds, but avoid thugs such as *Muscari armeniacum*. (There are better-behaved *Muscari* species and hybrids for the lawn.) Decide how much height you're willing to tolerate; if you can't leave the grass long for a while, you may have to resign yourself to annual replanting, which wouldn't be that bad in a small



space. Be aware of how long the bulbs stay in growth; for example, although *Anemone coronaria* is a gorgeous meadow species,

it stays in active growth here well into summer, so I have it in the border, not the grass.

One important note: don't apply broadcast lawn herbicide, including "weed and feed" products, as they will kill your bulbous plants. You can spot-spray dandelions, hawkweed, and other coarse weeds with Roundup (glyphosate) when the bulbs are dormant. If you can stand it, leave the veronica and chickweed alone—they are natural companions of most of these bulbs.

Keep the grass short during the bulbs' dormant season. I try to cut it in December after the fall bulbs have finished. If all the bulbs you've planted are very short-growing, you can mow as usual in spring, but with my daffodils and a few other kinds, I (or rather, my neighbors) have to tolerate a modest-sized hayfield until mid-June. The neighbors all think I'm crazy anyway, but I get many compliments on the early spring flowers and the lawn has inspired at least one new crocus grower.



Gardening with Bulbs



For those who can't make it to Yosemite to see the wildflowers bloom, Nhu Nguyen's pictures and descriptions run a close second. This is *Lilium parvum*. Story begins on page 1.

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The Bulb Garden © 2013

The Bulb Garden is the newsletter of the Pacific Bulb Society (PBS). It is published, if enough articles are submitted, around the third week of each quarter and is available to PBS members. This newsletter provides gardening or bulb related articles, news of interest to members, and announcements of the PBS organization.

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