Mariposa Lily or Mariposa Tulip

All have a tulip shape, although with much finer markings. In their native stands they are found in open areas like grasslands, forest clearings or even burned scrublands. C. venustus is considered to be the easiest to grow, but most of the others aren’t difficult, either. Most produce three to eight blooms on a bulb. Late rains are very good for Mariposas.

This group blooms second, the time depending upon their native range. The ones from San Diego bloom earliest of this group, and C. nuttallii and C. macrocarpus bloom in Summer because their range includes the Plains States, where the snow isn’t off the ground until March. The species keep to their sprouting and blooming schedules even when not at “home.” Even the seeds keep the pattern.
Growing Calochortus

Words really are inadequate to describe the Calochortus. You have to see them for yourself, or at least find color photos of them. The genus is known for its flower interior because each one has a mandala-like pattern at the base which botanists call a gland. You could literally meditate on any one of them.

Botanists and horticulturalists divide the genus Calochortus into three types, but they don’t agree on which species fall within each category. I’m using Robinett’s classification system here. (Everyone says they are following the same expert source, M.A. Ownbey, who published a monograph on the genus in 1940.)

There are no books on the subject, but there is a society: American Calochortus Society, 260 Alden Road, Hayward, CA 94541. Membership, including a +/- quarterly newsletter, is $3 a year. As you can see, this is some labor of love. Some people do tend to get obsessive on the subject.

The descriptions which follow are necessarily truncated, as there are about 40 known California species (other western states have about 20 more, as well) and new ones are still being discovered. The ones described at length are available and are the more likely to settle happily into your garden if you follow a few simple rules of hospitality.

Most important: Give them water from the first real cold in the Fall until they have finished blooming (roughly 5 - 6 months) and then make sure they have complete drought without being baked in hot sun the rest of the year. Ideally they would like to spend the Summer in a big tub, undisturbed, in your basement or a cool lathe house. They do not need light while dormant. Also, don’t make them compete with annuals, and make sure that the roots of any perennials or shrubs don’t come close, either.

All the people I talked with both love and grow them insist that the only way to do it right is to grow from seed. Some use cold stratification and some don’t. Chuck Baccus uses it routinely, and says they take from 12 to 24 months or more to sprout in his refrigerator. "You just watch and take them out and plant them whenever they are ready."

Some seeds from a single plant will germinate one year, some the next year and the rest over a period as long as five years. Apparently they have developed this slow release method to deal with environmental variability and maximize success.

Seeds need the same treatment as bulbs -- lots of water in Winter, none from May or so (whenever the bulb plants are dying back) until the temperatures drop in Fall.

There is great disagreement over whether or not to use organic matter in the soil mix. The risk is fungi. You’re on your own. Perhaps if the drainage is truly superb you can get away with it.

Many grow in serpentine areas -- not because they require it but because they have so little competition there.

All Calochortus like shade when the sun is hot. A tree or shrub is OK, so long as the roots are deep. They reform their bulbs annually, and so may change size, depending upon available water and the timeliness of receiving it. They definitely form a smaller bulb under drought conditions.

Calochortus are pollinated by many different native solitary bees and by “regular” honey bees.
Catalina Mariposa (*Calochortus catalinae*) These are tender; many growers lost them all in the Big Freeze. Grow to 2', usually double-stemmed, with a tulip bloom of white tinged with lilac or lilac with purple trim. Color is notable for lack of variability. Native to southern California coast and Channel Islands. Grows easily from seed in native range. Blooms March - May.

Gold Nuggets, Yellow Mariposa (*Calochortus luteus*) Vivid yellow with delicate red-brown markings. Grows to 1 to 2'. One of the easiest to grow. Wants sun. Hybrids with C. superbis wherever their native range crosses -- or in your garden. Easy. Likes open places, heavy soil, below 2000'. Native of Valley Grassland, Foothill Woodland and Mixed Evergreen Forest Communities in the Coast ranges from Santa Cruz Island and Santa Barbara to Mendocino Counties and in the Sierra from Kern to Tehama County. Blooms April - June.

Desert Mariposa (*Calochortus kennedyi*) Grows to 4-8" tall (sometimes to 1-1/2'), flowers flame red to red-orange, with purple or brown-purple anthers. Spectacular coloring that somehow avoids being in bad taste. Some varieties of vermillion, orange and yellow are known. This one takes as long as 9 years from seed. Four and five year old bulbs may only be as big as a large red bean. They will do well in the Interior and Foothill Woodland areas. Very adaptable, but able to handle a lot of rain so long as drainage is excellent. Native to deserts of Inyo, Kern, San Bernardino and Ventura Counties, usually between 3500 and 6500'. Grows happily in heavy soils or rocky soils. Blooms April - June.

Lilac Mariposa (*Calochortus splendens*) Pinkish lilac with a purple spot on each sepal and petal. 8 - 24" or even waist high. Needs the support of a shrub if it isn't to fall over. Easy to grow. Bulbs from high altitude like this one are hardy. Probably others are, too. They made it through the freeze in the bulb growers' fields. Want hot, full sun and dry Summer. Plant 8' deep. Loves clay. Native to dry slopes in heavy or granitic soil up to 6000' or more in the Chaparral, Valley Grassland and Yellow Pine Forest Communities from Colusa County south through the Coast ranges to Baja and Santa Catalina Island. Blooms May - June.

Superb Mariposa (*Calochortus superbis*) Usually creamy white, but occasionally pink or lavender, with red-brown and yellow markings. Grows to 20-30". Easy. Hybrids with C. luteus. Don't plant more than 4" deep (measuring to the top). Never gets to be a very large bulb. Likes open, dry slopes and meadows and partially shaded woods below 5000' in the Valley Grassland, Foothill Woodland and Yellow Pine Forest Communities in the Coast ranges, scattered from Shasta to San Diego Counties and in the Sierra from Shasta down to Kern County. Blooms May - June.

Goddess Mariposa (*Calochortus vestae*) Large, white with yellow, maroon and brown center. Grows 12 to 20 or sometimes 30" tall. Can handle a little Summer rain. Want to dry out slowly in the Spring, as they would in native range. Makes a very large bulb. Extremely colorful interior to the flower; an elaborate mandella to meditate upon. Many see a dark red M or W covered with gold hairs near the base of each petal. Native to heavy clay soils between 1500-2500' in the north Coast ranges from Humboldt to Napa and Sonoma Counties in the Mixed Evergreen and Yellow Pine Forests. Blooms May - June or July -- usually mid-June.

Lilac Mariposa
(*Calochortus splendens*)
Photo by CH Baccus
White Mariposa (*Calochortus venustus*) Probably the second easiest to grow. Huge flowers, usually white, but extremely variable color; some are deep red, bronze, pink, purple and light yellow. Markings are extravagant — may have purple on yellow on white or maroon on crimson with deep yellow -- all in extremely beautiful patterns. Medium sized plant. Lives in many types of soil and exposure, from dry, rocky open foothill slopes to sandy hollows and alkaline fields. Grows very deeply. Easy. Hardy. Ranges from 1-8000' (and has been spotted at 11,000') in Valley Grassland, Foothill Woodland and Yellow Pine Forest Communities in the Sierra from Eldorado to Kern Counties and in the Coast Ranges from the SF Bay area to LA County. Blooms May - June or July. The variety from the Santa Clara Valley blooms about a month earlier than the Sierra type, which sprouts much later.

Globe Lily, White Fairy Lantern (*Calochortus albus*) Usually pinkish white sometimes greenish white, 6 - 24" tall. Three-winged. Silky yellow hairs inside which you won't see until the very end of the bloom period, if at all, because this form stays closed, the petals overlapping. Native to several plant communities of foothills and coast and Channel Islands. There's also a Sierra form that's creamy white. Blooms April.

Coast Globe Lily (*C. a. rubellus*) A deep pink to wine red type, native to west facing areas of Santa Cruz Mountains down to Santa Lucia Mountains below 5000'. Usually smaller and more delicate. “From the outside resembling a blood blister,” Jepson said. I call this slander. Blooms April.

Diogenes' Lantern (*Calochortus amabilis*) Brilliant yellow flower, on a tulip-like plant growing to 15". This one is naked or nearly so, with few if any hairs. Gland is brown. Has to have shade from hot sun. Likes both rocky and loamy soil in native range up to 3000' in Chaparral, Foothill Woodland and Mixed Evergreen Forests of the north Coast ranges from Marin and Solano to Humboldt Counties. Blooms April.

Fairy Lantern or Globe Lily

Most often found in forest or wood in a dappled shade. These are nodding, smaller flowers, incredibly delicate, often with winged outer bracts the same color as the petals, or a darker shade. Sometimes green. The flowers all have a patinia-like sheen to them. There are only about a half a dozen species in this group, and they tend to bloom first, in February, March or April. These will take a little Summer water if they have to.

Star Tulips or Pussy Ears

Dry woods growers, as delicate and hairy as the inside of a cat's ear. “The pleasure of growing these little flowers...is completely disproportionate to their size,” says Kevin Connelly. Blooms last of all *Calochortus.*

(Cont'd on page 10)
Fred Smith on
Southern California Calochortus Growing

I've been growing the Mariposas since 1946. I've had an awful lot of failures. I don't know how to grow them perfectly. I think there definitely are some things we don't know about how the bulbs operate. But I've always had enough success to keep me going along.

I grow many other bulbs, too, but I still think the Mariposas are the most beautiful of all.

You grow them as you would any other of your native Spring bulbs — with light soil, light Winter watering, and once they start, very light fertilizer. And of course Summer dry. And for the most part they need to be grown in containers. Anything else I say about culture is about my area of Southern California (Glendale), which has its weather extremes.

I do plant new bulbs rather late. I usually start them around the first of November — give or take a period of time, depending upon when the rains come. If the rains come, then fine. I haven't done well planting them in January or February here, where we have spurts of hot weather on and off.

I think you're happier thinking of them as an early Summer bloomer, rather than a Spring bloomer. This year they were May. Most years they start in April. It depends on the weather. That's one of the reasons I love them. They tell you what the season and the weather is really like. Some years they will bloom — now I'm talking about the main Mariposa crop — all through the month of April and into May. This year we had cold weather and they didn't start blooming until the last week in April and went clear into June. They typically flower last of all my bulbs, so it's a great way to end the season.

They have a number of defects, which you can't get around. They are definitely a grassy plant — which is of course indicated by their name (Mariposa = Greek, beautiful grass). One of the biggest problems I have is that they are into occasional flowering. Many of them don't bloom every year. Another thing is that they have very poor asexual bulb reproduction, so you don't always get the identical thing.

Also, so many of them will bloom a year or two and then die out. Everything about them is slow — three to seven years from seed, and sometimes they are hard to transplant. You grow them. You realize you have to grow them from seed to keep them going, so you begin to play games, naturally.

To me the backbone are the true Mariposa group. Most of the Mariposa group will take a lot of sun, in fact they won't flower until they get some nice, warm sunshine. They strike me as being the flowers of sunny California hillsides. Another reason I love them.

I fell in love with them many years ago. I saw them growing when I was a kid, up in the local Montebello hills here. It was C. catalinae (Catalina Mariposa), I found out later on.

I don't have enough of them, or enough space, to sell them. As far as my objectives go, I just want to get some garden-ready ones. I think I'm awfully close to it, but you never know for sure. There's always next year. But I believe that next year, some of the crosses I made, if my theory is correct, should be ready.

I like to try things from extreme ends of the range, to get a little more genetic stability in there, so maybe we can make it into a halfway reasonable plant, a standard garden plant. They are beauties.

I have a fairly poor place to grow here. It's a cemented area around a swimming pool — that's where a good part of them are — and I keep them in big wooden boxes, mostly. It's an old community here, so we don't get full sun. The sun hits between 9:30 or 10 in the morning and by 4 or so in the afternoon it's gone. So it's not the perfect place to grow them.

I leave them in the containers for the most part, although this year I wanted to separate the Mariposas out that bloomed two years in a row from those that didn't. So I've done a lot of bare rooting this year — more than usual.

It's been a bad year. This business of when and whether or not to water Calochortus is to me a big joke. I was still hand watering at the end of February. They didn't like that at all. That's not good. Then all of a sudden we had our gigantic March rain and then April dry again.

I've tried everything in the book in the way of soils. A good bulb mix to me is OK. The oldtimers said 1/3 sand, 1/3 compost and 1/3 organic — I've used fir bark and redwood bark. I'm a little suspicious about peat moss on some of them. Around here I've been using — it may be a mistake, but I don't think so — heavily composted soil.

But half sand and half organic material would be good. I fertilize lightly, and I think I get definite results from it. I think they definitely benefit from some of the minor elements, as well. I'm convinced that using a bit of that Marl Limestone, which has magnesium in it, gives me a definite plus response in the species from the dryer areas.

By the way, sand varies tremendously in its quality. There's sand and there's sand. The sand that comes from our San Fernando Valley I don't like at all. The sand from San Gabriel I think is a lot better.
When we have steady moisture during the winter I try not to do any supplemental watering, but I do tend to get panicky. Particularly about the seedlings. There was one year it rained the biblical 40 days and 40 nights. I came home from work late at night and the bulbs were just sitting in water. I said to myself, "That's the end of my hobby!" But that was one of the best years I ever had. So with drainage they'll take a tremendous amount of water, apparently.

I feel they should be kept wet steadily in the Winter. I'd prefer Mother Nature to do it, but if she doesn't, I do it. Whatever Mother Nature does. She's indispensable, around here.

Fred Smith's Glendale Experience

I grow the Star types (Pussy Ears), which is the generalized name for one type of them. They don't do real well down here. I've grown Calochortus uniflorus (Meadow Star Tulip), one from the Central Coast of northern California. I can grow it; it blooms in March here.

I've had flowers off the little C. minimus, just one time. And C. tolmiei (Purple Pussy Ears) and C. caerules (Beavertail Grass) -- nice flowers one year, one flower the second year and the third year bingo, dead.

The Globes (Fairy Lanterns) do fine here, in the shade. But they tend to die out. Their seeds are slow to grow -- they're the ones that are four or five years or more -- so I can barely keep some blooming. They die as fast as I can produce them from seed.

I was also growing a little desert one, C. striatus, which seemed to do OK. The C. veedii group in general do fine, although they are notoriously occasional bloomers. Everything about them is very slow.

Our local ones, the C. invenisus -- which they call the Mountain Mariposa, I don't know why -- is OK. C. dunnenii -- that's the one from the mountains in San Diego County -- is hardly worth the effort here. It mixes with C. splendens, so you never know what you're getting, anyway. And then C. palmieri blooms once in a while.

The other ones: C. clavatus, is certainly a striking flower, but I just can't seem to keep it going. Then there's the desert red one -- C. kennedyi. I've never had a flower on it. It grows nicely; it has nice big four and five year old bulbs. I put it in the refrigerator and play all kinds of games, but I still don't have a flower.

C. splendens dies out.

C. concolor -- I've never been able to pick up for sure.

The C. catalinae is tender, but grows fine around here. I've been very happy with it because it blooms in March or even late February. C. luteus, superbus, venustus, vestae -- all do well.

C. vestae is a borderline one here. It's good in northern California. Last year it did beautifully, but we had a cool, pleasant May. Other years it begins to bloom and all of a sudden it is too hot and it begins to burn and wilt, so I put it in the shade, and then of course it gets very leggy.

I have a C. luteus, that's the yellow one, that first flowered in 1973. I still have it every year. It finally began to divide. So now I have four, instead of just one.

I've had the best results crossing the C. luteus. To me that's the best and easiest one to grow. It crosses with itself. I've had pure lines of it. I have two or three very outstanding clones of it. There they sit, year after year, and maybe after three or four years I get one or two other bulbs. Of course there are ways around that. But I do have two or three very outstanding ones.

I like to cross the different strains. I've done the most work with C. venustus. It probably takes more sun than any other species. My original thought was to cross the southern California type with the northern California type, which I've pretty much done, and hope that I'll get a garden ready plant that would grow reasonably. Some of these strains of C. venustus are so different, I'm amazed they are the same species. To me the determinate is always the gland at the base. In C. venustus it is always the little square item.

Although C. venustus are usually white, I got a yellow one last year, and a beautiful purple from near Placerville from a lady's garden that I've been carrying along for years and it looks like the ultimate, like Mariposas should definitely look. Blooms beautifully. I have a pure white one that is nice, and an almost pink and an almost orange, and some strange brownish brick red ones -- that's a very good cross. But they are harder to handle than the C. luteus.

The best ones of all are the C. venustus. And my best one of all of them were when I crossed a red that grows above 4000' with a white one that grows lower down, near here, and the red stays dominant. They grow nicely, every year. They are very interesting.

Fred M. Smith first crossed the border of California on New Year's Day, 1936. When he saw his first palm tree in Needles he was enthralled, and has been in love with California ever since.
Plant Sources

Calochortus albus (coastal form)
Baccus, Rob
White Fairy Lantern, Globe Lily

C. amabilis
Baccus, Rob
Golden Globe Tulip, Diogenes’ Lantern

C. argillosus
Rob
Hoover Mariposa

C. catalinae
Baccus, Zanin
Catalina Mariposa

C. elatus - southern (San Diego County)
Baccus - northern (SLO County)

C. lutea
Rob, Zanin
Golden Mariposa, Gold Nuggets
(plants from both sources from Sonoma County seeds)

C. splendens
Baccus
Lilac Mariposa

C. superbus
Baccus
Superb Mariposa
(Zanin by geographic area)

C. tolmiei
Rob
Tolmie’s Pussy Ears

C. umbellatus
Baccus, Rob
Oakland Star Tulip

C. uniflorus
Baccus, Zanin
Meadow Star Tulip

C. venustus
Baccus, Zanin (red, white & yellow)

C. vestae
Baccus, Rob
Goddess Mariposa

C. weedii
Baccus

(Yerba Buena may also have Calochortus bulbs. Check for availability.)

Cat’s Ears and Star Tulips

Calochortus coeruleus
Beavertail Grass
Rob

C. houelleii
Rob

C. minimus
Rob

C. monophyllus
Yellow Star Tulip
Rob, TPF

C. nudus
Naked Cat’s Ear
TPF

C. tolmiei
Rob, TPF

C. umbellatus
Oakland Star Tulip
Rob

C. uniflorus
Pink Star Tulip
Rob, TPF

Mariposas

Calochortus argillosus
Rob
Hoover Mariposa

C. elatus
Nthpln

C. flexuosus
Shy Mariposa
SW

C. imbenus
Mountain Mariposa
Rob

C. kennedyi
Desert Mariposa
Rob

C. k. munzii
Yellow Desert Mariposa
SW

C. lechtinii
Mariposa
Rob

C. lutescens
Gold Nuggets, Golden Mariposa
Rob, TPF

C. macrocarpus
Bigpod Mariposa
ALSF, Nthpln, SW

C. nuttallii
Nuttall’s Mariposa
Sego Lily
ALSF, Nthpln

C. pulchellus
TPF

C. splendens
Splendid Mariposa
Rob, TPF

Legend:

ALSC:
Abundant Life Seed Foundation
P O Box 772, Port Townsend WA 98368

Baccus:
CH Baccus
900 Boynton Avenue, San Jose CA 95117
Mail order ONLY

Nthpln:
Northplan/Mt. Seed
NAPG, Inc
P O Box 9107, Moscow Idaho 83843
(208) 882-8040

Rob:
Robinnett Bulb Farm
P O Box 1306, Sebastopol CA 95473
Mail order only

SW:
Southwestern Native Seed Co
P O Box 50503, Tucson AZ 85703

TPF:
Theodore Payne Foundation
10459 Tuxford Street, Sun Valley 91352
(818) 768-1802
At nursery or mail order for seeds only

YB:
Yerba Buena Nursery
19500 Skyline Drive, Woodside CA 94062
(415) 851-1668
At nursery only

Zanin:
Jack Zaninovich
Rt. 2, Box 708, Delano CA 93215
At nursery only
CALL FIRST:
(805) 725-9627 evenings
(805) 725-3163

Plants, Wholesale only:

GreenLady Gardens
The A J Skiltone Collection
1415 Eucalyptus Drive, San Francisco CA 94132
(415) 753-3332
Plant Communities - #4

23. Chaparral

This is the “classic” California landscape of steep, dry hills and ridgetops in the Coast ranges, from Shasta County south to Baja and below the Yellow Pine Forest Community in the Sierra foothills and southern mountains. Mostly scrub brush, rarely taller than 30', and often so dense as to be impenetrable. Fires here burn hot and spread fast, and much of the vegetation comprises stump sprouters. Soils may be heavy clay or thin and rocky.

Factors limiting growth here are hot, dry summers and thin, rocky, steeply sloped soils, subject to erosion where not covered by scrub. Precipitation ranges from 14 to 25", depending on latitude. Winters are cool but usually not cold. Growing season ranges from eight to 12 months with anywhere from less than a week to as many as three or four months of frost. Mean Summer maximum temperatures range from 82 to 94 deg., and Winter minimums from 29 to 45 deg.

To see the montane version of this community, try the slopes around Fallen Leaf Lake near Lake Tahoe. Near the Bay Area, Mt. Diablo has a pure stand. Try hiking the fire road up Mt. St. Helena at Jack London State Park, past the band of Knobcone Pine. In the Smith River area, near the town of Gasquet, you’ll find an entirely different type. And yet again, take El Camino Cielo, above Santa Barbara, in the Santa Ynez Mountains. Best time to see this community is April or May.

Chamise, Greasewood (Adenostoma fasciculatum)
Most common identifier. Grows on dry slopes and ridges, below 5000' in the coast ranges from Mendocino to Baja and on the western foothills of the Sierra. Blooms May - June.

Mountain Mahogany (Cercocarpus betuloides) Two varieties are found on the Channel Islands, and the species is quite variable throughout the state. Common on slopes and in washes below 6000', blooming March - May.

Ceanothus, varying by locality, blooming in Spring.

Flannel Bush (Fremontodendron californicum, or Fremontia californica) (in far southern Chaparral range, also Fremontia mexicana, which has a longer blooming period, but isn’t so showy.) Several subspecies and varieties. Grows in granite between 3000 and 6000 in the western Sierra foothills, then in rock and clay from Kern County south through San Diego County in the mountains. Blooms May to June or July, often in stands with blooming Ceanothus.

Toyon (Heteromeles arbutifolia) Prefers semi-dry slopes and canyons from Humboldt County to the mountains of southern California and in Sierra foothills below 4000'. Blooms June - July.

Holly Leaved Cherry, Islay (Prunus ilicifolia) Likes dry slopes and aluvial fans below 5000' in the Coast ranges from Napa County to Baja and in the Channel Islands. Blooms April - May.

Scrub Oak (Quercus dumosa) Common below 5000' on dry slopes in many plant communities. Quite variable and tending to hybridize with other oaks, even the very large ones.

Coffeeberry
(Rhamnus californica) var. 'Eve Case'
Photo by Gloria Bardin

Coffeeberry (Rhamnus californica) Another variable, widespread species, usually growing in rocky ravines away from the coast and on hillsides near it, usually below 3500'. Blooms May - July.

Buckthorn, Redberry (Rhamnus croce) Growing in dry gulches below 3000' in many plant communities. Blooms March - April.

Our Lord’s Candle, Quixote Plant (Yucca whipplei) Finds stony slopes between 1- 4000' in southern mountains. Blooms spectacularly when it’s ready, in April or May, and then dies.

24. Coastal Prairie

Usually between the coast and the Northern Coastal Scrub, this perennial grass and herbaceous community, now largely taken over by introduced annuals, inhabits the westward hills and glades of the outer and middle Coast ranges from the San Francisco Bay Area and Trinity and Mendocino Counties north to Oregon, usually below 4000'. Intergrades with Northern Coastal Scrub and sometimes Mixed Evergreen or Redwood Forests. Growing season is generally about 9 months with mean Summer maximums of 80-94 deg and mean Winter min. 30-38 deg.
Growth is limited by wind, near the coast, and erosion. Inland, will suffer from Summer drought; fog near the coast partially alleviates that.

This community may have moved into areas which once hosted Northern Coastal Scrub, so it may shrink if we let things go back to where they were originally. Composition varies, depending upon elevation and distance from the ocean.

Salt Point and Sea Ranch on the north coast are excellent examples of the coastal form. Inland you’ll find an island of it at Annadel State Park. San Bruno Mountain is a very rich example. See this one late April into early May, or, at Salt Point, into June.

Blue Dicks, Wild Hyacinth (Brodiaea pulchella) (aka... Dichelostemma capitatum) Common throughout California west of the Sierra crest below 3000’. Blooms March - May.

Pacific Reedgrass (Calamagrostis nutkaensis) Moist places near the coast from Monterey County north.

Golden Mariposa (Calochortus luteus) In this Community in the Coast ranges from Marin to Mendocino Counties, in open clay soils below 2000’. Blooms April-June.

(Carex tumulicola) One of more than 140 native species of the largest genus of flowering plants in California. No popular names. This one likes meadows and grassy slopes of open woodlands, so lives near the wooded margins of this Community between 100-4000’ from SF Bay to Del Norte County and northward.

Bolander’s Aster (Chrysocephalum volubile bolanderi) Usually grows on slopes overlooking the coast below 1500’, blooming any time from June to November.

California Oatgrass (Danthonia californica) Although it is found on dry hills and meadows, it must have some water, so usually is concentrated near the coast or in areas with subsurface moisture. Grazing animals particularly lust for it, and will usually pull its roots up in their passion. In this Community, from south to north end of range.

Pacific Hairgrass (Deschampsia caespitosa or Deschampsia hoehnii) Likes wet places on the margins of this Community, growing here between the SF Bay Area and north.

Idaho Fescue (Festuca idahoensis) Grows in many plant communities, below 3000’, usually in dry open woods and on gravelly slopes. Ranges from south to north borders in this Community and far beyond.

Hairy Gumweed (Grindelia hirsutula) Likes dry slopes of coast ranges to Napa County in this Community. Blooms April - July.

Douglas Iris (Iris douglasiana) Finds a home widely on grassy, open slopes throughout this range, blooming March to May or later.

Summer Lupine (Lupinus formosus) Extremely variable. Throughout the Community, and frequently in others, too: hill and dale. Blooms April - October.

Bluff Lupine (Lupinus variclor) Hugs the coast, prostrating itself in the wind, the entire length of this Community. Blooms April - July.

Bracken (Pteridium aquilinum pubensere) Very common in many plant communities and elevations. Here it grows in moister areas of otherwise dry places.

California Buttercup (Ranunculus californicus) Finds meadows and hillsides wet in Spring in many plant communities throughout California west of the Sierra crest below 3000’. Blooms February - May.

Yellow Mats (Saricinia arctioideae) Find this in sandy valleys and grassy hillsides below 1000’, usually near the coast, throughout the Community; blooms March - May.

Blue Eyed Grass (Sisyrinchium bellum) Exceedingly variable and widely distributed; usually in open grassland, with March - May blossom.

25. Valley Grassland

Most notably comprising the Great Valley, but also the hot, dry, low valleys of the inner Coast Ranges, e.g. Salinas, San Benito and Antelope Valleys. Rises to about 4000’ in the Tehachapi and mountains of eastern San Diego County and characterizes the coast from SLO County south. Rainfall varies from 6 to 20” and growing season is extremely variable: as few as 7 months in some areas, 11 in others. Frost-free days are equally variable. Mean Summer max. temperatures are hot - 88 to 102 deg, and mean Winter lows are 32-38 deg.

Native trees here are limited to the Valley Oak, which inhabits the fringes; for riparian vegetation here, see Freshwater Marsh. (Not really covered by Munz). We know Great Valley river banks were originally home to sycamore, walnut, cottonwood and many willows in dense, floodplain forests. Of course, the water table then was much higher, too. See bibliography in next issue. Vernal pools, or, in the vernacular, hog wallows, still remain in a few places.

Factors limiting growth are the long, hot dry summers and drop in the water table. Some places drop below freezing, requiring hardy plants. Hardpan and calcium soils in some areas are limiting, but hardpan helps to create vernal pools, too.

To see a remnant of what the Great Valley Grasslands used to look like, visit Jepson Prairie near Vacaville (which doesn’t have much in the way of bunchgrasses, however), and Lakeview, Bear Valley in Glenn County (this one has shallow soils, so not the bunch grasses, but it does have vernal pools), and Table Mountain and Vina Plains near Oroville. Once more, Annadel State Park at False Lake Meadow, For vernal pools, also see the area west of Chinese Camp area near Yosemite Junction.

See vernal pools late April or early May, wildflowers in general all of April and into early May and bulbs all during May.

Poverty Three Awn (Aristida divescata) Not endemic to California, but common in poor soils in S. California parts of this Community.

Firn Bluegrass (Poa scabrilla) Also not endemic to California, but common in good soil on both open and protected hillsides to 5000’ in many plant communities. Highly variable.

Valley Oak. Roble (Quercus lobata) Needs rich loamy soils, in valleys and slopes below 2000’ where it grows to be the largest oak in America. Not reproducing itself.

Purple Needlegrass (Stipa pulchra) One of the major grasses throughout California grasslands. Covers open, dry slopes in most non-desert communities from the Sierra foothills west.

Nodding Stipa (Stipa cernua) Similar distribution to S. pulchra; blades more slender, awns more graceful.
Golden Cat's Ear, Yellow Star Tulip (*Calochortus monophyllus*) Small gold flowers, some with red spots, covered with short hairs and growing only 3 - 8" tall. Put them where you can see them at eye level, if possible. Great for rock gardens. Native to the upper range of the Foothill Woodlands Community, and the lower Yellow Pine Forest of the Sierra, between 1200 and 3600', from Shasta to Tuolumne Counties. Blooms May to June.

*Tolmie's Pussy Bats* (*Calochortus tolmiei*) White to pale lavender, bearded with blue, purple or lavender hairs inside. Very charming. Small -- 4-16" high. Seeks very try, often rocky soil on open slopes or in woods below 6000' in Redwood Forest, Chaparral, Mixed Evergreen Forest and Yellow Pine Forest Communities from the northwest through the Coast ranges to Santa Cruz County, and to upper Sacramento Valley. Bloom May to June.

*Pink Star Tulip* (*Calochortus uniflorus*) Medium-sized flowers on small plant with a very short stem. Pale pink to pale lavender, often with a purple spot near

**Stan Farwig and Vic Girard on Calochortus Research**

I hate to give prescriptions, or recipes, to people. I think it's much better to give principles, and the principles are very simple. Lots of moisture when they're in growth, absolute drought when they're not, no standing water, but try to keep them as evenly moist throughout their growing period as you can.

The first year we had them, I didn't water 'cause I thought it would be harmful to them. And they struggled along, but it's different growing in containers than in nature. So I learned from that that when we have drought, I do keep them moist throughout the Winter, permanently moist. They like lots of water when they're in growth and the nights are cool.

They're susceptible to a pathogen that requires two things: moisture and high temperatures. So, in Winter they're denied the high temperatures and in Summer they're denied moisture.

The second year we were growing them, we'd been up in Oregon and coming back, on the Fourth of July, I'll never forget it, we had torrential rains. In fact, we had to stop over at Laytonville because we couldn't see the road. How often does that happen, that you have rain like that at that time of the year? I knew that they were supposed to have drought and I was quite concerned. As soon as we got back we took up the bulbs, and sure enough, there was a white fungus growing on the bulb coats already. So I always tell people: You don't plant them with your petunias and your pansies.

You do one of two things: you plant them where you don't mind having a dry garden -- and that's becoming very fashionable -- or you take them up and put them down. If you're going to take them up each year, then put them in a container and take the whole container up and put it in a cool, dark and dry place.

We started growing in boxes because they were easier to manage for us and provided good drainage and we didn't have our own house at the time. They were redwood boxes, 8 inches deep. I started out doing four foot boxes, but hauling them around was too much. I quickly went to two foot boxes, 12 inches across. I actually now am going to these large, 7-gallon plastic containers, which are deeper, and they like that better.

We had a lot of bulbs we thought we'd lost because they hadn't flowered for a number of years. I've been dumping...
the boxes upside down the last few days, and I’m finding hundreds of bulb in them. They were trying to get lower. We know how to grow them now; what we still don’t know is how to get them to flower regularly, that’s the next problem.

Some species have a root that forms a bulb a little deeper each year. In tulips that’s called a dropper. The first time we saw that, it solved some mysteries for us.

We saw it in another bulb, first. It was growing in almost solid granite except for the stem parts that disappeared in a crack. You wonder, how did that bulb ever get down there? And then we found a C. venustus that did that. It put out a thick root, almost like a taproot.

What it does is drop down and form a new bulb each season till it gets to a place it likes. Then it’ll flower; it won’t flower before it gets down to where it wants to go.

In heavy granite scree, it puts that little dropper through a crack and works its way down and then through another crack. And often when you take them up, you see a whole necklace of old bulb cases, which is the result of this gradual working down

I’m dubious about the business of their digging themselves deeper with a corkscrew action. I’d like to know how many pounds of pressure is exerted to pull a bulb deeper into the soil. Those roots would have to be terribly strong to force a bulb down.

It’s possible that some of these bulb plants which don’t have dropping capacities may have contractile roots.

In very, very hard adobe soil, particularly in a desert or semi-desert situation where the soil never gets quite so wet, you will dig down and you’ll see the husk of the old bulb and then you’ll go down and you’ll see another husk, maybe three or four, and it keeps dropping. I cannot really say that it was the roots that pulled it down.

But what you can do, for example, with Calochortus vestae, or Calochortus venustus, if you catch them at the right time of year, you will find from the basal plate at least one spongy process coming out like a great, thick white spongy root.

I am changing my soil mix, for both seedlings and bulbs. The reason is we had a strange thing happen with escapes. You know, in traditional literature, Calochortus have the reputation of being terribly difficult to grow, they’re only for the specialists, and that sort of thing. Well, we have them volunteering around the yard, and that to me is a very peculiar characteristic for a plant that’s impossible to grow in the garden.

Many came up with a beaded iris from the Middle East that is very tough to grow. One of the requirements for them is they need magnesium and calcium in the soil. So I had these boxes of irises with very sandy soil and dolomite, because that’s both calcium and magnesium. And the C. venustus that volunteered in there were magnificent. I mean, they go 2 feet tall, I had as many as 15 flowers on them. And they flower every year, which most Calochortus don’t.

I hesitate to outright recommend it, but it certainly hasn’t hurt them, and they’re flowering better than they ever have.

When I started I more or less tried to duplicate the original soil with the proviso that their box is not on a nice slope. I mean, I made it a looser soil than the adobe they grow in in nature. But I’m now making it a much looser soil, sandier soil, and then adding dolomite, and the results are good. I would probably recommend it unreservedly if I had another 3 or 4 years to grow them. But it’s an interesting thing to try.

One of the reasons Calochortus have a reputation for being difficult is based on old literature. You’ve got to realize that the vast majority of the experience with them was gained from collected bulbs by Carl Purdy, which were sent willy-nilly back East, probably to people who didn’t know a damn thing about California natives, and they flopped.

Collected bulbs are much harder to adapt than cultivated bulbs. I don’t know why they don’t do better back East, except the East is subjected to freezes and thaws and freezes. Well, hell, when these grow up at four or five, six thousand feet in the Mother Lode country, they’re subjected to thaws and freezes too.

People back east have to take them up in Summer, that’s true. But you’ll even read among people who know that, that they’re hard to grow. On the other hand, a Dutch nurseryman was here, who grows six species fine in Holland. But there they do the same thing, they take up millions of bulbs to store over the Summer and then replant them in the Fall.

People here always ask themselves, are we temperate enough to grow such-and-such a bulb here, but they rarely ask themselves, are we cold enough to grow here? The same thing is true of Calochortus. The English all say you should bake them, which may be true in England, with the summers they usually have. They mean dry in the sun, let the soil get very, very hot when they are dormant. But they are lucky, those poor bulbs in England, if the soil ever gets to 75 degrees.

One thing I push a lot is growing seed, it’s very easy. We have about 30% flowering in the third year with
C. venustus, and extensive flowering in the fourth. They come very readily from seed.

I know, Americans want instant gratification.

I have to start from scratch when I teach people how to grow California natives by seed. They want to wait until the lovely April days, Spring days, to plant all their seeds, when they should be planting them in October because they’re cold germinators.

What really triggers them is cold. What I usually do is wait until Autumn to plant them. I’ve had them in sand, in the garage underneath the house where it’s cool, and when I go to plant them, their roots are coming out already, without a drop of water, while those in the boxes outside are still dormant.

You can keep them dry, like in a bottle, just sand, and October, November, you dump them to plant them, and you’ll see from the basal plate all the little bumps around where the roots are going to come up. Sometimes they’ll even be half an inch long.

The other thing I would recommend for all of the native California bulbs with the possible exception of Camasias and lilies, is whatever potting mixture you use, make sure that it is highly mineral. Don’t use a lot of organic material, because that’s just an open-door invitation to all kinds of fungus and soil pathogens of various sorts, and you don’t want that. They don’t have to deal with this in nature. They grow in pure, hard adobe, except for the woodland plants, where the adobe is mixed up with leaf mold and so forth. But you don’t want to introduce a lot of organic material. I’ve seen people grow them in soil mixes that I’d put house plants in. And they’ll grow profusely, but they usually grow soft and they don’t last.

Adobe soils tend to be very full of good nutrients once they’re moist. So our adobe soils are basically very, quote, rich, unquote.

If you go into the desert and find Calochortus growing there you’ll see they like heavily mineralized soils. They don’t get very much nitrogen, unless it happens to be in the rock.

One has to be careful with species that come from an area other than what I would call the California temperate region. These are species from the other side of the Sierra Mountains, Washington, Oregon. These, we find, are best treated not as Fall growers like the common ones that we all know, but best as late Winter, early Spring types. These are from areas which are covered by snow and frozen throughout Winter, and they don’t break ground until quite late.

It took me a long time to catch onto this. We had some seedlings from the Owens Valley, which I planted the first year as I would our regular Mariposas. They germinated fine, they came up beautifully. I noticed they died back earlier than the other seedlings, and then we never saw them again.

If you give me a long enough time, I’ll have an idea -- I suddenly realized that these don’t come up in the Fall at the same time as our more common Calochortus, they couldn’t possibly. They come up late Winter, early Spring. So now I usually hold them cold and dry until late January, February, under cover, in one of the greenhouses.

There are some exceptions to this, but they don’t apply to California natives you’ll ever find for sale.

We have started an experiment with some of the desert Mariposas: C. kennedyi, C. flexuosus. We decided that our Winters are much too temperate and wet for desert plants. The bulbs rot. So we hold the desert ones until January, and give them a couple of months of good rain, and man, they come up like gangbusters. That’s what they do in the desert, they make hay while the sun shines and the rain comes.

C. venustus, the red one, comes from Mt. Pinos at over 6,000 feet, down at Gorman Grade. That’s over 6,000 feet. But they do well here under our normal conditions. They have adapted well and don’t need that treatment. But the ones that evolved with real Winters, not Mediterranean climates, really do.

For me, the whole thing about growing bulbs is to learn as much as you can, but then also keep an open mind and don’t be afraid to experiment.

I often say to people, “Don’t accept other people’s failures as your own. Go ahead and try it. Because someone in San Francisco couldn’t grow this in their back yard doesn’t mean you can’t grow it in your back yard in Oakland -- or Paso Robles.”

Vic and Stan were a couple of raw and eager Easterners who discovered in California a world they never knew existed -- and found out to their amazement that most Californians don’t know it, either.