

The Bulb Garden



~Gardening with Bulbs~

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Exciting South American Bulbs for Summer and Winter Growing

Nhu Nguyen



Nhu Nguyen, president of PBS, spoke to the California Horticultural Society in San Francisco last October. The following is a condensed version of his speech entitled "Exciting South American Bulbs for Summer and Winter Growing." Nhu gardens in

Berkeley, California so his talk is focused on that area and includes southern California. His talk covered bulbs of South America that are less commonly grown in our gardens as

compared to South African bulbs. He provides an overview of these bulbs and how to grow them. While information on some species is scant, hopefully this will encourage you all to try some of these beautiful, often unfamiliar bulbs. — Ed.

The secret to growing plants suc-

cessfully requires us to know their habitats and this applies to any plant, bulb or not. Knowing the type of soil in which bulbs grow and knowing the type of climate where they are found are the first two types of information necessary. The third is the symbiosis where

they are found; that is, how bulbs connect to their environment and to other organisms. Being a biologist, I have to tell you about a really cool plant you probably already know.

This is *Sarcodes sanguinea* or

Snow Plant and is found in the Sierra Mountains of California. If you want to grow any plant, you need to know rainfall patterns and temperatures, but not with *Sarcodes*. To understand how this plant grows, you must go underground because it does not take carbon or most

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Top: *Eucharis amazonica*. Above: *Sarcodes sanguinea*. All photos throughout this article by Nhu Nguyen.

Exciting South American Bulbs (cont'd)

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of its nutrients from sunlight. It steals them from a fungus which is mutualistic with pine trees. When you dig up *Sarcodes*, the root ball is about the size of your fist with nodules which are covered with a white fungus and are referred to as a mycorrhizal fungus; this fungus connects the root ball of *Sarcodes* with an adjacent pine tree.

The Pacific Bulb Society's website contains a Wiki with a growing list of bulbs, including photos, descriptions, habitats, etc. You will hear the term "geophyte" used frequently, and in a broader respect this clump of *Sarcodes* roots with its mycorrhizal fungus intertwined can be considered a "geophyte".

Most of what I am going to talk about are plants with these underground storage structures, mainly

bulbs. We define these structures by where the meristems are. Bulbs have meristems that are covered or protected by these leaves, so meristems can grow and differentiate into all sorts of structures (such as leaves, pedicels, flowers, etc.).

One example of a corm is the gladiolus corm – meristems tend to be at the very top of corms. An example of a tuber is a potato. If you can imagine the stem of a plant, and enlarge it from the inside, you will see that there are nodes (growth points) where the leaves used to be or would have been, and these nodes are what produce new plants. I won't talk much about rhizomes, but irises have rhizomes, for example. The term *geophyte* refers collectively to these underground structures.

Now we'll go to South America, a continent with a broad range of climatic zones, including tropical and sub-tropical places with dry and wet rain patterns, cloud forests, deserts, and then this lovely slice of Mediterranean climate. If you want to grow winter-flowering bulbs in California, then you will want

to grow plants from Chile, so keep that in mind. I will focus mostly on this region, a little bit on bulbs that grow in Argentina, bulbs that grow in the cooler Andes Mountains, and bulbs that grow in areas with Mediterranean climates.

I'd like to take a more reductive approach to cultivation of bulbs that come from these wide variations of habitats. Yes, they might behave slightly differently in their native habitats, but when you plant them in your garden, it's easier to reduce them to two patterns, because if you grow hundreds of them it's kind of hard to do everything at once. The first regime is to have plants that grow in the summer and stay dry during the winter. The second would be the opposite of the first: plants that stay dry in summer and wet in winter, which is perfect for us (in California) because



Bomarea edulis.

you don't have to do anything. Then there are some that require moisture year-round such as *Bomareas*. This is a very, very general recipe for geophyte cultivation, but I would say bulbs like to be well-drained. They may like to be very moist when they are

growing, but they don't do so well when they don't have good drainage. Get the water flowing through. I often use a 1:1 organic (to inorganic) mix but I will go as lean as 20%, which means 80% inorganic and 20% organic (i.e. 80% sharp sand or ¼ 10) for desert bulbs. Some of the desert bulbs don't like our weather here because we get too much rain. Amaryllids like to have a lot of room for roots, as do some South American species. With *Boophone*, for example, most of the storage organ is actually in the root, not in the bulb, so give them lots of room. *Rhodophiala* is another good example. However, this won't necessarily apply to all species that I discuss.

Give bulbs moderate to full sun and water them whenever they want, summer or winter. And I like to
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Exciting South American Bulbs (cont'd)

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fertilize. One approach to growing bulbs is to avoid fertilizing them, but giving them a little bit of fertilizer really helps some of the bulbs. You all know Calochortus; you've seen it in habitat and know what kind of soil it grows in. It's not rich at all, but they love to be fertilized in cultivation. One thing I must stress is to respect dormancy. If you do not respect the dormancy, some of these bulbs will rot on you very, very quickly. I'm not trying to scare you from growing bulbs because they are fantastic little packages, and full of surprises, but to grow them well, you need to know their dormancy.

When you are growing bulbs, you all have to worry about sucking insects and mealybugs. Bulbs do attract them, but there are several things that are specific to bulbs themselves, like bulb flies, fungi and viruses. Before I go

bulb flies, is known as narcissus bulb fly, although it is not just specific to Narcissus. They are attracted to many bulbs, especially South American bulbs, because they're

just delicious, I guess. They lay eggs, the larvae hatch and crawl into the bulbs, eating them from the inside out. At the same time, the larvae secrete anti-fungal, anti-bacterial substances that will prevent the bulb from rotting too fast. Then, when you



Above: *Rhodophiala granatiflora*. Top right: *R. bifida* pink form. Bottom right: *R. bifida* Texas form.

any further, prevention is the best treatment, so do what you can to prevent diseases from even catching in the first place. The bulb fly, *Merodon equestris*, one of several

look at your bulb pot the next year, you see nothing growing and pull up the bulb, and squeeze it. It's soft and
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Exciting South American Bulbs (cont'd)

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squishy on the inside and you find these little larvae squirming around.

There are several preventive measures. You can use pesticides, but if you don't like to do that you can stand there and catch flies with a net, which is what I did. They're not too common, mostly in places where there are daffodils. For more treatment and prevention, go to the PBS Wiki for information.

Rust is a fungus you've probably seen on bulbs, especially in winter. It gets into the leaves and sometimes into the bulbs and roots (but you will only see the spores on leaves and petioles). The bulbs mostly suffer when it is too wet and cold. It doesn't really kill the plant quickly and can be treated if you dry the bulb out and remove all infected material. Don't recycle the bulb in compost. Throw it out with the trash. This is really the

only major fungal problem bulbs will get that can deteriorate them, apart from rot.

Viruses are bad, and they tend to hide in bulb collections, so we do our very best to weed them out, because they can be spread between plants by sucking insects. Some plants survive pretty well with virus, but with bulbs, the virus(es) spreads, weakening them over several years. We had some beautiful *Haemanthus* that were infected; they just went downhill from year to year, getting smaller and smaller, and eventually dying. Quarantining bulbs doesn't do much because the viruses can spread through fleshy

amaryllid seeds. Keep your plants as virus-free as possible. *Hippeastrum* (from South America) show a breaking pattern (in the leaves and flowers) when they get infected with mosaic viruses, and our native bulbs such as *Brodiaea elegans* can also get them. This is because I didn't get rid of the aphids fast enough, allowing the aphids to spread the virus. The good news is that you can grow bulbs from seeds and that tends to get rid of viruses, except for amaryllids, because the

viruses spread to fleshy seeds. It's especially important to keep viruses away from your amaryllids, because you can't get rid of the virus.

For summer growing geophytes that need summer rain, watering should start here when the temperatures are above 50° F (10° C). California has a Mediterranean climate which is the opposite of what

they like, so these will need to be protected from winter rain. Unfortunately, a lot of South American bulbs, the really nice and charismatic ones, are all

summer growers, but the good thing is that even with our drought, they don't need a whole lot of water. You can keep them barely moist and they will be fine, although those that grow on forest floors will like a little more moisture. When the leaves show signs of dormancy such as turning yellow or developing a mushy texture and drop, stop watering. Don't keep the bulbs especially dry or bone dry, because summer growing bulbs don't like to be dried out completely. It stresses the root systems too much. For winter growing bulbs, you can keep these very dry in summer.

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Right: *Pamianthe peruviana*.
Below: *Merodon equestris*,
the bulb fly.



Exciting South American Bulbs (cont'd)



Paramongaia weberbaueri

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 grow. The first is *Pamianthe peruviana* which is a summer grower with a habit of leaning a bit, which makes me think that it grows out of rock crevices or trees. I believe its habitat is no longer intact so you won't find this in the wild any more, but it is in cultivation and has beautiful fragrance. They like very well-drained soil so we grow them in pure Japanese pumice which can be obtained at bonsai stores. The roots seem to prefer the Japanese pumice. This *Pamianthe* enjoys low to moderate sun, but doesn't tolerate full sun well, and receives a good bit of fertilizer because of the pure pumice mix. It is susceptible to mealybugs and viruses. *Pamianthe* has been around for a while, and if you find one, it's worth the cost.

Paramongaia is the South Amer-

ican equivalent of the daffodil, and I'm not talking about any dinky daffodil. The bulb is as big as my head. It's a summer grower with a very nice fragrance, but there is also a second, winter growing form. *Paramongaia* likes very well drained soil and a lot of light, but not direct full sun, and a lot of fertilizer. It is not as rare as *Pamianthe*, but does pup quite prolifically. It is susceptible to bulb fly and if, over a period of a few years, you find tiny little bulbs, it means the bulb fly has eaten the big bulb and smaller bulbs have regenerated from the basal plate left over.

The third of the holy grail is *Worsleya procera* and this is very, very finicky. Strybing Botanical Garden and UC Irvine no longer have this; Huntingdon does have one. But to get it to bloom, you have

to have the perfect habitat. Seed is very expensive and there is much discussion about the type of media used to grow *Worsleya*. I think it comes down to living in the right climate and giving it the right media, basically pumice. Pumice is magic. The reason it rots so easily and dies is because it grows on rock cliffs in the Organ Mountains National Park (north of Rio de Janeiro, Brazil). *Worsleya* grows in an area that's not quite tropical and definitely doesn't like to be grown outdoors here. New Zealand and South Africa are the two places where these grow really well, as well as Western Australia and Sydney, Australia. I grew it from seed and I've had it bloom once; it's still alive, and it's in a little box we have for growing tropical plants.

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Exciting South American Bulbs (cont'd)

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The most charismatic of South American bulbs have to be the *Hippeastrums*. There are only about ninety species in this genus, but there are over 600 hybrids, thanks to efforts by the Dutch and

flower.

Hippeastrum sp. *Cardoso Moreira* is another one from South America where there are two centers of diversity, in Argentina and Brazil and in the highlands of Peru. This species, as yet unnamed,



others over several centuries. I like to grow the species because there is a lot of variation that isn't captured by the hybrids, but the species are a lot harder to come by. Most are summer growers, but there are some winter growing species as well. They enjoy rich, well-drained soils and moderate sun. In the Bay Area (San Francisco, California), I would give them 50% shade; otherwise they burn. *Hippeastrums* are especially susceptible to mealybugs and viruses. The following snippets are a broad example of the genus. Also consult the PBS Wiki for more information.

Hippeastrum aulicum, as with all my hippeastrums, is grown in a one-gallon pot. It blooms pretty well and fills out the pot, sending up a nice red green spike somewhere around Christmas. The leaves are thick and the flowers have beautiful purple stamens. Another nice *Hippeastrum* is *H. evansiae*, with a yellow

well as making offsets like mad. *Hippeastrum striatum* grows very well outside here, with some shelter from the rain. Finally *Hippeastrum reticulatum* is a tropical species that the Thais have been breeding for a while now. *Hippeastrum reticulatum* var. *striatifolium* has a nice white midrib, while the hybrids always have a yellow midrib rather than pure white.

The next genus is *Ismene* which I like a lot because it has beautiful fragrance. It used to be called *Hymenocallis* and there are about ten species. They look somewhat like spider lilies and are mostly summer growing and winter dormant. Hybrids are common. They enjoy well-drained soil, somewhat richer media, with moderate sun and fertilizer, but are also susceptible to a lot of pests and diseases, especially thrips. When *Ismene* bloom, the thrips like to come and tear up the



Top: *Hippeastrum aulicum* var. *robustum*. Bottom: *Ismene longipetala*.

is from Brazil, and is tiny but cute! *Hippeastrum bukasovii* is very nice but hard to grow because it likes to be cool. Other hippeastrums that you should consider are *H. iguazuianum*, and *H. striatum*, which is tiny and easy to grow, as

flowers, so they do a lot of damage quickly. *Ismene* hybrids tend to be a little bit more resistant.

Ismene is the only bulb I know that has a festival named after it. The "Fiesta de la Flor de

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Exciting South American Bulbs (cont'd)

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Amancaes" in Peru includes picking this flower, using it for decoration and there are dances. If you search online for the name

Ismene amancaes and festival, you can read about it, but a bit of Spanish is helpful or use Google Translate. If you ever put your nose to this, it's just wonderful. If you had a whole bouquet, how could you sleep? Another species, *I. hawkesii*, is white. *Ismene longipetala* has spidery flowering segments similar to spider lilies.

Two hybrid *Ismenes* that are most common are 'Sulphur Queen' and *I. x festalis* (*Ismene narcissiflora* x *Ismene longipetala*). 'Sulphur Queen' is so common in cultivation that a lot of them are virused. The first year mine bloomed and then it went down and down. They also have a wonderful fragrance. *Ismene x festalis* is white and if you don't grow it, you probably should. It does well here in the ground. It needs very good drainage, but is not particularly picky. I grow it in Berkeley in the ground. It goes completely dormant in winter, so remember where you have it.

Phaedranassa are wonderful although most of them look pretty similar, except for one species. *Phaedranassa*

dubia is a pretty nice one. They are mostly summer growing winter dormant and enjoy well-drained soil. This species likes to be fertilized and it's susceptible to mealybugs

and viruses as well. But it does have these glossy, waxy flowers that are very desirable. To tell some of these apart you have to look at the filament of the stamen to see if it's actually pink or white, as well as a combination of other characteristics. They are not easy to identify. *Phaedranassa viridiflora* is the distinctive one of the genus and turns yellow and green, whereas all the other ones are red (or orange) and green-tipped, such as *P. glauciflora* and *P. camiolii*. *Clinanthus* and *Stenomesson* used to be treated as one genus and are now two, although people still confuse the two. There is an explanation on the PBS Wiki regarding the taxonomic treatment and how to tell these two genera apart. In general these are summer growing and winter dormant. Some keep their leaves even in dormancy. Some species require cool moist



Top: *Stenomesson pearci*. Bottom left: *Phaedranassa viridiflora*. Bottom right: *Clinanthus incarnatus* 'Yellow.'

winters to bloom. To get them to bloom, I think the trick is to keep these slightly dryish and give them a cool enough dormancy (above freezing). *Clinanthus incar-*
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natus has two forms, one yellow and one red. *Clinanthus variegatus* apricot form has large flowers about 12 to 15 cms, resembling a real apricot hanging on the branch. You can tell *C. incarnatus* and *C. variegatus* apart by the length of certain flower structures.

Stenomesson pearcei is one of the *Stenomessons* which needs a cooling down period to bloom.

Stenomesson miniatum (formerly *Urceolina peruviana*) multiplies fairly slowly, so it takes a while to get a pot with lots of stems. Although it is not exactly vibrant red, hummingbirds are fond of it. *Eucharis* are mostly understory forest plants so they don't like too much sun. Some are very elegant but some don't smell so good. The most commonly available plant is a hybrid, either *E. amazonica* or *E. x grandiflora*. It's hard to tell these two apart.

While we can't get the big giant

Worsleyas that grow in the Organ Mountains of Brazil because nobody can grow them and because they are hard to

find and expensive, we can grow tinier versions, such as this particular species *Griffinia espiritensis* ssp. *espiritensis* pretty easily. It produces a nice umbel of flowers whenever it wants. It doesn't want too much sun so you can definitely grow it on a windowsill.

Moving away from Amaryllidaceae, I'd like to talk about some of the summer growing Irids, since some of the bigger species grow pretty successfully in the ground here. The three to be considered are *Calydorea*, *Cypella*, and *Herbertia* (see images on page 10). They enjoy rich, and, of course, well-drained soils with lots of sun. The larger species can be grown in the ground but watch out for rodents. They are also susceptible to mites when summers are dry. *Cypella herberti* is nice, easy to grow and seeds are available pretty often. Join our society and get some

seeds. *Cypella coelestis* is a very nice one, tall, to about five or six feet, with good blue flowers. I grow it in the ground and it blooms in profusion, mostly during the summer, if you do it right.

Another Irid, formerly known as *Cypella* is *Hesperoxiphion peruviana*. It's slightly smaller than *C. herberti*, and blooms a little bit later; it has been called a 'one-day wonder' because each flower blooms for one day and is done. However, they make multiple flowers so they bloom day after day for weeks.

Herbertia lahue is probably the most common in the genus, a tiny thing, and cute! *Herbertia tigridioides* is

another nice one, slightly less common, but still very nice.

Herbertia pulchella is an absolutely beautiful species, my favorite in the genus. It multiplies easily and

sets seed, but is not recommended for the garden because it is tiny, only four or five inches tall.

So summer is done and we'll go on into winter. Most of these bulbs come from Chile and the Atacama Desert area of Chile where they have a Mediterranean-type climate. They are very susceptible to rot in the winter. Has anyone ever compared the Mediterranean climates and realized that our California climate is the driest of all the Mediterranean climates? We get almost no water for many, many months. Chile is second on the list. For example, our native bulbs like *Calochortus* that get wet during summer dormancy die, and the same thing happens to these bulbs from

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Left: *Griffinia espiritensis* ssp. *espiritensis*. Top: *Clinanthus variegatus* var. 'Apricot.' Right: *Eucharis amazonica*.

Exciting South American Bulbs (cont'd)

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Chile. They are very rot-susceptible and I grow them and bulbs of the *Amaryllidaceae* in a very, very lean mix, 1:3 or even 1:4 organic to inorganic.

There are 27 species in the genus *Rhodophiala* and I can't grow them. I rot them out very quickly in Berkeley. They need to be protected from a lot of rain, and need a lot of sun, so if you live in a place that's windswept, that has good drainage and decent rain, you can probably grow them. However, *Rhodophiala bifida* 'Hill Country Red' is as tough as nails (unlike the others), and is supposedly sterile, but that's probably because there's only one clone. They are self-sterile as are many amaryllids. They love sun, so give this one as much sun as you can. The key to getting them to bloom is to plant them in the ground and leave them. If you live in a hot warm place, this could be the clone for you. The spikes of flowers are about a foot tall, and there are various forms with gradations to pink.

Phycella ignea is another neat little bulb, about two feet at the spike. The University of California Botanic Garden in Berkeley has a nice colony that blooms in



Phycella ignea.

spring, up by the monkey puzzle tree.

Leucocorynes are in the onion family and there are dozens and dozens of them in South America. They need to be very dry in summer as the bulbs rot very easily for me if they get any water at all. *Leucocoryne vittata* is a nice one to try. *Leucocoryne ixiooides* is tough. I've had it for a number of years and it blooms for about two months. Also try *Leucocoryne purpurea*. The PBS Wiki lists a number of species with information. Seeds are available from www.chileflora.com.

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Minutes, April 3, 2016 Board Meeting

Your board of directors met on April 3, 2016. After making us all extremely jealous by reporting on his new job in Hawaii, Nhu called the meeting to order at 12:08 pm. All were present.

We are very grateful to all members of our board, who will remain in their positions for the 2016-2018 term.

Our non-profit status is official! We received our Exemption Letter from the IRS on March 11, 2016.

Arnold reported that our Fidelity Four in One account has grown 26% since it was funded. Nonetheless, we discussed moving our account to UBS Bank, which has provisions for non-profit organizations. We will consult with an accountant. Now that we are incorporated, we will need to file form 990N. We also agreed with Arnold's recommendation that we keep a cash reserve of a minimum of 25% (the amount recommended for accounts over \$10,000).

Jane indicated that our membership totaled 346, and she and Arnold discussed the distribution of renewal notices.

Robin reported that *The Bulb Garden* is back on schedule. She welcomes comments from anyone who would like to suggest changes! Nhu indicated that the archiving project is complete. Presently, all back issues of *The Bulb Garden* can be purchased for \$20 (download) or \$25 (thumb drive).

We adjourned at 1:15.



Treasurer's Report, 1st Quarter 2016

BALANCE 1/1/16	\$39,128.01
U.S. Members	\$940.00
Overseas Members	\$875.00
Contributions	\$25.00
BX Receipts	\$1,889.00
Investment results	\$54.73
TOTAL INCOME	\$3,783.73
BX/SX Postage	(\$335.22)
BX/SX Support Staff	(\$72.85)
Board Conference Calls	(\$16.62)
Treasurer's Supplies	(\$29.48)
Publications	(\$1,475.00)
Publication postage	(\$597.97)
PayPal Expense	(\$140.12)
Register domain name	(\$86.70)
<i>Bulb Garden</i> editing	(\$500.00)
TOTAL EXPENSES	(\$3,253.96)
Net Change in Account	\$529.77
BALANCE	\$39,657.78

Exciting South American Bulbs (cont'd)



Top two photos: *Cypella herbertii*. Bottom two photos: *Herbertia pulchella*.

Exciting South American Bulbs (cont'd)

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Tecophilaea cyanocrocus is the blue crocus from South America. There are three forms, a bright blue, a kind of pale iffy blue, and a purple form. My favorite is the bright blue because every time I show it, everyone just oohs and ahhs and can't believe their eyes. It's not a fast multiplier and doesn't make seeds readily, so it's a bit trickier, but it is worth the effort. You'll kill it in the ground very quickly. It wants to be warmer and drier and will multiply more quickly that way.

Of course I can't get away from talking about *Tropaeolums*, or nasturtium relatives. They are mostly climbers, with about 85 species, so there is a lot of diversity on tap. Some are

tuberous, and they enjoy rich, well-drained soils. Some species are easy, but many are finicky. They will make a tuber and go to sleep for three or four years before they wake up, for which the unpredictable weather patterns of the Atacama Desert are responsible. When they

finally wake up, they are quite pretty, with massive amounts of smaller flowers.

One that everybody needs to grow is *Tropaeolum tricolor*. The "tricolor" comes from the flower which is red, black and yellow. With a big enough tuber, you can make a scaffold for it to climb three or four feet. They are spring blooming and go completely dormant in the summer, so keep them dry. I find that they lose their roots before they lose their leaves, so I stop watering earlier, in April or May, or I dig up the tubers and put them in a drier medium.

The reason that everyone should grow this species is because it is very easy for us here in northern California. It doesn't need any protection, has lasted through some frosty nights, and comes back every year. It's not like these other species (*T. azureum*) that can stay dormant for many years. Mine is in a one-gallon pot. You can try it in the ground but I think the rodents will find it tasty, so



Above: *Tropaeolum tricolor*.
Right: *Oxalis perdicaria*.

try it in a pot in the ground which will protect it. The other species that you should grow is *T. brachyceras*, which is yellow. Give it the same treatment and it will come back every year. My tropaeolums came from Telos Rare Bulbs, Ferndale, CA, which has a website.

One oxalis I will mention (because I really love oxalis), among over a thousand species, with 500 in South America, is *Oxalis perdicaria*. This is a winter grower with flowers that close up at night. It has a lovely honey-



scented fragrance during the day. It can bloom in profusion and is best grown in a pot.

Finally, there is *Bomarea edulis* 'Pink Jaguar', with a pattern in the inner petals that other *B. edulis* do not have. *Bomarea edulis* has a wide range and probably needs to be studied a bit more. This one may become a different species but for now, we are calling it this.

Many of these South American bulbs were completely unfamiliar to me, as they may be to you. Keep your eyes open for the PBS seed and bulb exchange announcements as seed and/or bulbs show up on these lists, providing an opportunity to try some new, unknown or special bulbs. — Ed.

Congratulations to the recipients of this year's Mary Sue Ittner Award:

- Evan Eifler: Phylogenic Study of Geissorhiza
- Mariano Saviello: Surveying Trip to Study the Endangered *Habranthus sanavirone* in Habitat
- Cody Howard: Trip to Tanzania to Collect and Study *Ledebouria*

All recipients are invited to contribute an article about their work. We hope to be able to bring you updates about the outcome of their research soon!

Gardening with Bulbs



Inside this edition, PBS President Nhu Nguyen shares a condensed version of his California Horticultural Society presentation, "Exciting South American Bulbs for Summer and Winter Growing." Photo by Nhu Nguyen.

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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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