University of California, Irvine

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For members of the Friends of the UCI Arboretum
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Adventures with *Amarylis belladonna*

Third in a series on bulb propagation
By Laura Lyons, Nursery Manager

Until now we have primarily focused on some of the "natural" ways to propagate bulbs – sowing seed, handling cormels and other naturally occurring offsets. We certainly encourage them with good soil, fertilizer, and careful weed management, but ultimately Nature is taking its course.

However, horticulturists have a few tricks up their sleeve when "natural" methods do not suffice.

One of the more interesting artificial methods of reproducing bulbs is known as chipping. To explain how chipping is done we need to venture into botany and discuss the term true bulb.

As I commented in a previous article, the term "bulb" is used informally by gardeners. Technically trained botanists talk about corms, rhizomes, tuberous roots, and bulbs - often referred to as "true bulbs" to differentiate between informal and formal usage.

The perfect example of a true bulb is an onion. True bulbs consist of layers (known as scales) formed around a central core. They possess a small knob of tissue at the bottom known as the basal plate, where the roots come from. The leaves and flower stems emerge from the top of the bulb, though, at least in the case of *Amaryllis belladonna*, the leaves originate in the basal plate, sprout through the core and emerge from the top.

Chipping on *Amaryllis belladonna* is done in the late summer or very early fall, after flowering but before the leaves sprout. Using a sharp knife the bulb is divided into sections – from four to eight, depending on the size of the parent bulb. The key is that each section MUST include part of the basal plate. Some of the sections may already be forming natural offsets, but it is interesting to observe the structure of these bulbs. After letting the sections dry a bit, each one can be planted into a 1 gallon pot, labeled according to variety, and taken down to the bulb house. The soil should be kept evenly moist during the growing season.

In our experiment, the first sections to show green foliage were actually the sections that had offsets, even though several of those got sliced in half during the chipping process! By midwinter, though, tiny leaves start to emerge in some of the other pots, showing that tiny bulbs were starting to form from the cut sections.

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This was almost certainly an offset already forming on the original bulb. Sliced in half during chipping, you can see how the scales are regenerating the missing half! A few segments of the original bulb are visible at the top, and it has a good, strong root system visible in the right of the picture. Compare its size to the bulbils in the photo on page 5.
Photo by Laura Lyons

A *Hippeastrum* by Any Other Name.. is NOT an *Amaryllis*

By Doug Westfall, Pacific Bulb Society

A topic that frequently brings "raised eyebrows" is the use of the name of one of the more popular bulbs, "*Hippeastrum*." These are bulbs with showy, beautiful, trumpet shaped flowers that are so available around Christmas time, labeled as "Amaryllis." You can find the bulbs in square boxes with a hole in the top of the box and often a flower spike protruding from the hole. With all due respect to the growers, primarily in Holland or South Africa, these are hybrids of the genus *Hippeastrum*. They are members of the family Amaryllidaceae. While there are a great number of bulbs that belong to this family, this article will focus on the genus *Hippeastrum*. *Hippeastrum* are a genus of bulbs with many beautiful species. They are native to several of the countries in South America. Very few are found north of South America and may not actually be native to Central America.

There IS a genus called *Amaryllis*. They are the wildly popular "naked lady," *Amaryllis belladonna*, that Laura discusses in her page 1 article. They are closely related to the members of the genus *Hippeastrum*.

There is significant diversity in the growing habits and soil requirements of the *Hippeastrum* family. A few like to live in marsh areas. Some are most frequently found growing in moss in the crotches of trees or clefts in rock formation. Some are found at sea level while others are found high in the Peruvian Andes in deep river gorges. With some care, most of them do very well in our Southern California coastal climate.

The growing medium for most *Hippeastrum* consists of a "gritty" mix of decomposed granite and/or pumice, sand and peat (about 25% total), and 75% of good, organic compost. Mix this thoroughly and place the bulb just up to the neck. Water just enough to settle the potting mix.

Most *Hippeastrum* bloom during the summer. A few bloom in the late winter or early Spring. Be very sparing about fertilizing *Hippeastrum* when blooming. If you feel that you must, use very diluted fertilizer. Wait until they are dormant and then do not over fertilize.

Hippeastrum develop offsets during their dormancy. It is best not to remove offsets while they are still attached to the mother bulb, and especially if they are still sharing a basal plate. Wait till the offsets separate completely, usually after two seasons.

A few of the more sought after *Hippeastrum* are *H. intiflorum, H. bukasovia, H. argentium, H. parodii, H. hamisonii* and *H. arboricola* (which is epiphytic). There are others and this list could be debated. There are two closely related bulbs which top all on this list. They are *Worsleya rayneri* (the blue *Amaryllis*) and *Paramongaia weberbouri*, a large, yellow, fragrant *Amaryllis* that looks like a large, 8 inch daffodil.

Hippeastrum, like many bulbs, are interesting to grow from seed. On July 18, 2009 I will host a workshop on growing *Hippeastrum* from seed at the UCI Arboretum. The workshop will run from 10 a.m. to 11:30 a.m. and is free to members of the Friends of the UCI Arboretum.

Growing *Hippeastrum* from Seed

A workshop by Doug Westfall

at the UCI Arboretum

Saturday, July 18

10 a.m. to 11:30 a.m.

Particpants will learn about planting and growing seeds of these wonderful bulbs, plant seeds under Doug's supervision, and take them home!

FREE to members of the Friends of the UCI Arboretum

$20 per person for the general public

Reservations required - call (949) 824-5833 by noon, Wednesday July 15 to reserve your spot!

A Spring Walk in the Garden

by Laura Lyons, Nursery Manager
reprinted from the Volunteer Times

Who doesn't love spring? Beautiful blue skies washed clean of smog, warm afternoons (though keep that jacket handy in the early morning!), and of course, LOTS of flowers everywhere.

I leave the offices and pass the greenhouse, turning down the main entrance path. The *Clivia miniata* at the entrance jumps out at me with its orange to orange-red blooms, contrasting vividly with the dark green foliage. Bright red seeds from last year's flowers add another touch of color. By the pond is a riot of color, a lone golden *Freesia*, rose-pink *Velthemia capesis*, a touch of pink from the blooming fairy wands. The Baja gardens are in front of me; not a lot blooming there yet, but the various *Agave* species are putting up some pretty impressive flower spikes.

Turning to the left I head down toward my goal, the California gardens. On the way I stop to admire the South African Bulb garden; it's in a minor lull right now before the late season flowers bloom, but there's quite a patch of *Lachenalia pustulata* blooming, still some late blooms on the vivid yellow cobra lilies (*Chasmanthe floribunda* ssp. *ducketii*), and a few purple *Babianas* poking up here and there.

Continuing on I get a great overall view of the California hill. Big patches of vivid yellow jump out at me; the Coast sunflower (*Encelia californica*) is in full bloom all through the various habitats, and rightly so; it is a key shrub to a number of habitats in California, most notably the coastal sage scrub that would have dominated the uplands of the Irvine valley, alternating with native grasslands where the clay was particularly heavy. The native grassland is my goal today, but I stop at the Otay mountain garden to admire my favorite native plant, *Lepechinia ganderi*, or Gander's pitcher sage (*photo, right*), just coming into bloom, and the

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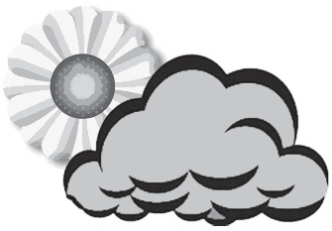
'June Gloom? No, June Bloom!'

June Bloom Plant Sale

Saturday, June 13 10 a.m. to 3 p.m.

Unique selection of summer bulbs, perennials, and succulents



Advice on selection, planting, and care

Clearance sale on our remaining spring stock

Free admission and parking

For more information call (949) 824-5833
or visit our website at arboretum.bio.uci.edu

neighboring *Ceanothus otayensis*. This native lilac is a little past peak bloom, grey-green foliage starting to show through the snowy drifts of white blossoms.

Taking the middle path up toward the Clarke garden, I get a close up look at one of the sunny patches of Coast sunflower; reality intrudes for a minute as I note with a sigh that there is a nice patch of stinging nettle opposite it that needs to be pulled. We've banished the annoying black mustard to the fringes of the garden but the stinging nettle keeps intruding.

There's more coast sunflower ahead and it lures me on. The path I walk intersects the Clarke garden loop; the graceful flower heads of purple needlegrass (*Nassella pulchra*), *Melica imperfecta*, and *Nssella tenuissima* are rising above the foliage and swaying in the afternoon breeze. More gold greets me, *Amsinckia menziesii* most notably; a very successful wildflower in our gardens and apparently rabbit proof to boot!

I pause midway up the hill; the *Ceanothus tomentosus (photo, top left)* has passed its peak but is still beautiful; a veritable cloud of pale blue it was last week. More coast sunflower competes with black sage *(Salvia mellifera*), forming a dense thicket at the top of the hill.

My goal is in sight, the new benches just installed in the Chaparral garden. Opposite is more *Enclia* and vibrant *Penstemon spectabalis (photo, bottomo left)* .It's my break, and a beautiful afternoon, and for once I want to just stop and smell the flowers!

Updated 2009 Plant Sale Calendar

Saturday Sale Saturday, July 11 9 a.m. to noon

Saturday Sale Saturday, August 1 9 a.m. to noon

"The Art of Flowers" Fall Art and Flower Festival

co-sponsored by Orange County Fine Arts, Inc.

Saturday, October 17 10 a.m. to noon *Friends preview 9 a.m.*

Summer Bulb Repotting Begins At Arboretum

by Laura Lyons, Nursery manager

This morning as I walked through the bulb house I enjoyed the last wonderful blooms on some of our late bulb species such as *Watsonia, Ixia, Alliums* and *Tritonia*. Pinks, oranges, and soft pastel yellow tinged pink – what a treat!

Our bulb propagation is going wonderfully, and with a pinch of luck, next year will see a lot of new species coming up for sale. During the winter the volunteers have fertilized, weeded and watered the bulbs assiduously, and the bulbs have repaid their care by multiplying and growing rapidly.

The advent of warmer days and especially warmer nights is sending our beautiful South African species to their summers' rest. We should be ready to start repotting right on schedule in mid-June.

During the first part of the summer we will be concentrating on our parent stock and our seedling bulbs. Parent stock is the quantity of bulbs held in reserve to produce the next generation's seed or offsets. Often we start with a very small quantity of a bulb and need to build up the "parent stock" first to ensure a reliable long term supply. How much parent stock we need depends mostly on how vigorously the bulb reproduces itself vegetatively. For example, many of the *Chasmanthes, Tritonias, and Ferrarias* reproduce themselves quite enthusiastically. For these groups we need less parent stock and can harvest much more frequently. Other bulbs are slower to reproduce themselves. We need more parent stock of that species before we can begin releasing a species for sale. The popularity of the bulb also comes into play – the more popular the bulb, the more parent stock I keep.

If we are lucky enough to get seed, the process can be speeded up enormously – to a point. As I've observed in the past, bulbs are often slow to reach blooming size from seed – but we often have quite a lot of seed!

I'm often asked which pot size I prefer for long-term cultivation. Bulbs don't have a very deep root system so a pot's depth is not as important as its width. Our stock in trade is what is known as a "3 gallon short." It provides adequate depth for good growth, and even filled with soil is light enough to be manageable for most volunteers. For very young bulbs, we generally use 27 quart plastic boxes, drilled with drainage holes; I'm also experimenting with the shallow version of the Rubbermaid Roughneck tote, mainly because the plastic seems more durable. Plastic, as we all know, does tend to break down eventually when exposed to sunlight, but the Rubbermaid totes are of a plastic very similar to those used in nursery pots and tends to hold up longer. Eventually, these trays are lifted and the bulbs move up to the 3 gallon size.

During the growing season I tag pots with colored tags. Different colors signify different needs Are the bulbs crowded and need to be divided? Is this tray of young bulbs ready to go up into 3 gallon pots? Best of all is when I can tag a pot of blooming bulbs for sale

We have plenty of seedling bulbs ready to be harvested and given more room to grow, as it were, as they march toward maturity and blooming size. We have some lovely seedling *Moraeas* that showed first bloom this year, and some very interesting *Albucas* that are coming along slowly but nicely. These and many other varieties need fresh soil and more room to grow.

For other, slower growing species, it is their time to get a "fresh start." All of our bulbs are repotted at least every three years. Some of the most desirable species, every two years. As we all know, potting soil breaks down over time, and providing the bulbs with fresh, weed free potting soil helps them grow and multiply.

The stage, as it were, has been set. After the June Bloom plant sale, the Friday Club will start the ball rolling, giving us a bit of a "warm up" as it will, for the summer season.

Bulb lifting workday; Saturday, June 27th

Fortunately we have the volunteers of Pacific Life on our side! Pacific Life's corporate volunteer group comes twice each summer to help with our summer's bulb repotting. The first session is scheduled for Saturday, June 27 from 8:30 a.m. to 11:30 a.m. Pacific Life will accomplish the bulk of the bulb lifting – removing the bulbs from the potting soil – during the June 27th session. All our volunteers and Friends are also invited to join in on the fun – indeed, you can be a great help to me, working alongside the Pacific Life volunteers.

After the "Good Guys" have done their "good work," it will be up to our Arboretum volunteers, to repot the bulbs in fresh soil and fresh pots. Some items will be repotted in 1 gallons and sold as blooming bulbs next winter and spring; others will go back into larger pots – usually a 3 gallon, sometimes into shallow tubs – and returned to the bulb house for another year.

Bulb repotting work will be done on selected Fridays starting June 20th. I invite you to join either our workday on June 27th or one of the Friday sessions during the summer. For specific dates, contact Laura Lyons at (949) 824-5833 or e-mail ldlyons@uci.edu

Amaryllis belladonna propagation, continued from page 1

Here let me briefly digress and explain that over time the Arboretum has had some very interesting strains of *Amaryllis belladonna* appear in our large patch of "naked ladies" down near the South African bulb garden. We started with a very floriferous white, the regular pink, and a very nice dark pink. Over time the busy bees did their thing and seeds formed after each blooming season, falling to the ground and germinating in their turn. About five years ago we began to see many curious hybrids appear in the bulb garden and began digging up and potting some of the more interesting combinations. I bloomed them for a couple more years to make sure the hybrid was stable in color, and to wait for time to produce offsets of the desired colors. One was a lovely "blush" pink, the other white with a dark pink picotee edge – quite striking! By Fall 2007 I judged I had enough of each to chip several bulbs while holding the rest in reserve for future propagation. I also chipped several bulbs of our very popular white variety.

By midwinter almost half the "chips" from the white variety were showing tiny leaves, evidence they were forming "bulblets" (small bulbs), but the blush and picotee varieties appeared discouraging with very few sections showing leaves. However, when I checked the sections they still seemed healthy – no rot or drying out. I shrugged and let the growing season play itself out. My, am I glad I did!

In late May I pulled three pots of the blush pink, one that had shown leaves, two that had not, and dug them out of the pots. The sight of healthy, growing roots on all three sections was encouraging, and as I examined the sections, bulblets were evident on all three! Though some of them had not gotten large enough to put out leaves, they were nevertheless forming bulblets. Having examined three more pots in mid June, I believe the bulblets survive by drawing on the sugars from the original sections. Several of the "scales" were withered and had died, though some sections were still healthy. Somewhat surprisingly given how badly I treated the poor darlings, chopping them into pieces like that, none of them showed any rot or disease.

So far I have seen from one to three bulbils on most sections. They are still firmly attached to the original basal plate and I plan to leave them that way for at least one or two years, until each forms its own distinct basal plate and roots. At that point we can separate them and grow them up to sellable size – which will take a few years! A past experiment with chipping yielded a few bulbs blooming after three years with the bulk taking 4-6 years to reach blooming size. There's a distinct trade-off involved – sometimes a section will yield only one fairly sizable bulb, and that one will quickly reach blooming size. Others yield up to eight!!! bulbils, but those are pretty tiny bulbils indeed when they have seven friends. Obviously, they will take much longer to reach blooming size.

I made sure the pots were kept just slightly moist during the summer to help protect the roots, which do not die in the summer unless the pot gets too dry for too long. Late in August I repotted the chipped sections. Several of the old scales were still healthy and left attached to the basal plate, but old, withered scales were removed to minimize the risk of rot. Some of the divisions had mealybug, which was treated by soaking the infected sections in a solution of 1 tsp Ivory soap in a gallon of water for 30 minutes. The sections were repotted close to the top to help the leaves reach the surface quickly, which they did! All but one or two of the original sections are showing healthy leaves from the growing bulbils. We've kept up a regular fertilizer regimen this growing season, and I'm excited to see how much they have grown this summer, during the dormant season.

Still, this has been another worthwhile experiment, and I look forward to chipping other varieties that have popped up in the future.

Three vividly white bulbils are visible in this image. The young bulbs have not yet formed the protective outer layer, or tunic, usually brown on most bulbs. The tunic protects bulbs from dryng out, espeically during the dormant season. *Photo by Laura Lyons*