

The Bulb Garden



~Gardening with Bulbs ~

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Raising a Bulb Collection from Seed—Jane McGary

Jane McGary lives in a suburb near Portland, Oregon, with a half-acre garden including a large unheated bulb house and several rock gardens. She is a charter member of PBS and serves as Membership Coordinator, and has also been active in NARGS for many years. She recently retired from working as an editor of academic books.

When I used to sell surplus bulbs through an informal list, it surprised me how eager other gardeners were to buy certain kinds, such as species *Narcissus* that can be grown easily from seed. I have acquired around three-quarters of my large collection by purchasing seeds or getting them through exchanges or wild collection, beginning around 1990. I was inspired to do this when the late Molly Grothaus, a fine bulb grower, brought a pot of *Fritillaria raddeana* in flower to a North American Rock Garden Society (NARGS) chapter meeting. She mentioned that she had grown the plants from seed, and noticing my enthusiasm, she later gave me some of the seeds they had set. Today I still have half a dozen of the original bulbs grown from those seeds.

Why doesn't everyone who wants bulbs grow them from seed? Some say, "I don't have a place to grow seeds." In most climatic regions in North America, all you need is a flat place that can be covered during inclement weather. Even the worst carpenter in the world (and that would be myself) can knock to-

gether a simple cold frame, a box of boards or masonry blocks, and cover it with something translucent. I grew many of my first garden plants, including bulbs, in this way, though I now keep vulnerable seedlings in a glass-roofed shed. Some growers in severe-winter regions grow seedlings in a basement under lights.

Others object, "It takes forever to get a flowering bulb from seed." It can take many years for certain bulbs to flower, but most kinds can be raised to flowering size in four or five years, and some (*Allium* or *Crocus*, for instance) take only three. Some *Cyclamen*, such as *C. hederifolium*, can even be flowered in a year. If you're willing to plant a small tree or shrub and wait years for it to grow into a characterful specimen, you probably have the patience to raise bulbs too.

The pros of growing bulbs from seed far outweigh the cons. If germination is reasonably good, it saves money, even when you invest \$8 in a packet of 20 seeds and only 10 or 12 germinate. A "population" of seed-grown bulbs contains a number of different clones, genetically varied, so the grower can select the most vigorous or attractive, and the plants are much more likely to produce fertile seed than are purchased bulbs, which may have been vegetatively propagated from a single clone.

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Raising a Bulb Collection—McGary *cont'd*

Many growers feel that bulbs grown from seed to maturity in one garden adapt better than mature bulbs brought in from elsewhere. Finally, home-grown seedlings are less likely to be infected with the plant viruses and fungal or bacterial diseases well known in commercial stock.

A “population” grown from seed is likely to display some color variation. Seed saved from plants in cultivation may produce bee hybrids, such as several crosses between *Fritillaria purdyi* and *F. biflora* that arose in my own collection, and these hybrids may have extra vigor as well as aesthetic interest.

Most of all, you can grow species from seed that are rarely if ever available as bulbs: western American *Calochortus* and *Brodiaea*, collections from Central Asia and the Caucasus from a range of Czech specialists, or Mediterranean *Crocus*, *Iris* and *Narcissus* and Iranian *Fritillaria* from Kurt Vickery or Oron Peri, along with special discoveries in the NARGS, Alpine Garden Society (AGS-UK), Scottish Rock Garden Club (SRGC), or PBS exchanges. Your own wild collections will be priceless souvenirs of your travels.

General procedures

Different growers use different seed-sowing mixtures, but most of us stick with just one formula for almost all seeds. Mine consists of one part sieved peat, one part ground horticultural pumice, and two parts coarse, gritty sand, materials readily available in my area. Many growers substitute Perlite for pumice, and I think some use vermiculite in seed mixes. My mix works well for me but the pots are heavy to lift in large flats; on the other hand, I think it retains moisture more evenly than mixes with artificial ingredients, since the pumice absorbs some water and releases it slowly. As an alternative, John Lonsdale reports that BioComp BC5 – a composted peanut hull-based compost available to growers in eastern North America – when mixed 50:50 with super-coarse Perlite, makes an excellent light, well-drained, moisture-retentive sowing and growing medium for all bulbs.

When to sow. A few kinds of bulbs have seeds with short viability in storage, and they are best sown as soon as possible after ripening, although some germination can be expected in most cases even if sowing is delayed but the seeds have been correctly stored. Examples include most bulbous *Corydalis*, *Fritillaria meleagris*, *F. cam-*

schatcensis and possibly other northeast Asian species, subtropical amaryllids such as *Zephyranthes* and *Habranthus*, and many of the ephemeral woodland geophytes. To predict short viability, consider where the plant grows naturally: if seeds are likely to encounter moisture immediately after ripening and being disseminated, they may be short-lived, but if they ripen during a long dry season, they probably can withstand dry storage for months or even years. North American *Erythronium* is a perfect example in which species native to summer-rainfall areas have short-lived seeds, while those from dry-summer regions have long-lived seeds.

The majority of temperate-climate geophytes come from regions with moist winters and dry summers. Their seeds can be stored dry at room temperature until early fall and sown in cool, moist conditions at that time. The seeds should not be frozen, although some species tolerate freezing at this stage, but they should be kept cool – under 60° F/15° C – through the winter. When extended subfreezing temperatures are likely, I move my germinated and ungerminated seed pots to the ground and wrap them in micro-foam sheet insulation. A few kinds of bulbs can stand freezing when very young, but most cannot.

Even if you don't get your seeds until after the New Year, I recommend sowing them right away. Some will experience a long enough chill to germinate in the current year, and others will remain dormant through an entire year and then germinate the following year. I have sown seeds received until April with success, but John Lonsdale writes, “If I get anything after the middle-end of February I refrigerate them until the fall. Here on the east coast anything that germinates in late spring doesn't get enough time to build up a decent bulb before going dormant, and the seedlings are all too easily lost in the summer.” The difference in our experiences is probably due to the cooler temperatures, especially at night, during spring and summer in the Pacific Northwest where I live.

How to sow. I sow most bulb seeds on the surface of the seed soil mix, cover them with a sprinkling of soil mix, top with enough ground pumice to conceal the soil (any kind of medium-fine grit will do), and press the surface down gently but firmly with a flat-bottomed pot. Large seeds, such as those of *Iris* species, can be

GROWING BULBS SUCCESSFULLY FROM SEED—Johannes-Ulrich Urban

Johannes-Ulrich (Uli) Urban was born in 1956 and is a pediatrician by profession. After a happy working life he decided to start something new at the age of 60 before it would be too late to do so. He sold everything in Germany and moved to Portugal in summer 2017 to create a new garden in a good climate. He has a deep life-long interest in plants of all kinds and has often considered becoming a professional gardener but finally never did. "Now my passion for plants can run free... but fortunately there is my partner. He will sometimes stop me smilingly..."

During his professional life he lived and worked in France, England, Switzerland and then in Germany; many trips led him to interesting people and places (and plants) in the Americas, Asia, Africa and Europe. Especially the years in England have marked him both professionally and plant-wise. Very many times he was overwhelmed by the generosity and gardening knowledge of his English friends. Gardening and travelling are somewhat contradictory... but this way many plants in his collection have a personal history. (All photos taken by Johannes-Ulrich Urban unless otherwise noted.)

Climate: Our garden is at an elevation of 350 m (1150 feet) on the south facing slope of the Foia which is the highest mountain in the Algarve, Southern Portugal. The climate is a moderated mediterranean climate. Moderated due to the elevation and the influence of the Atlantic Ocean which is 25 km (15 miles) away both in southerly and westerly direction. The climate is practically frost-free but early morning temperatures in the coldest months of January and February can come close to freezing; our microclimate allows the cold air to drain down the slope. The valleys can be 7°C (44° F) colder at night. Winters are mild and rainy with sunny spells, summers are warm to hot and dry. We are exposed to wind and there is a risk of fire. The international classification by Koeppen and Geiger is Csb (cool summer Mediterranean), average rain per year is 650 mm (26 inches) but we have measured more. Our garden soil is a deep fertile and very well absorbing loam, the bedrock is a relatively rare rock called Monchiquite, very deep down it is basalt, the origin of our mountain is volcanic, and there is slight seismic activity. We have massive exposed rocks in the garden. The soil and the water from our borehole are lime free.

Having grown bulbs from seed for many years on a small scale, sown now and then when interesting seed (mostly from various BXs) was available, I am not a beginner in this field. But having moved to Portugal and having started a new empty garden in a Mediterranean climate, I took on the challenge to sow a lot of winter-growing bulb seed. It was a chal-

lenge in the sense that I very quickly realized that I had to learn gardening again (the hard way sometimes...) in a new and very different climate. But this new climate also offers opportunities which I never had before, especially the fact that I can now grow winter-growing bulbs in the open. The first sowings were made in autumn 2017 in fairly small 3-inch (7,5cm diameter and depth) round plastic pots. These were the ones used routinely in Germany under glass. Germination was generally good, the seedlings grew quite well but then came the first



summer, hot and dry. Very hot. I watered the pots occasionally because I knew from past failures that small bulbs can dry to death if kept too dry during their first dormancy. But next autumn showed clearly that my regime was not good, many pots never sprouted again and those which did had lost a high

percentage of the seedling bulbs. I put it down to a too small pot size and too little water. Maybe a sand plunge would have helped but I have never done this so far.

So in autumn 2018 I started a very large batch of seeds from various sources. I had ordered a wholesale box of square 8 x 8 cm pots 8.5 cm (3-inch square by 3.5 inches) deep, sturdy black plastic. Sowing was done as early as possible but due to delays in seed delivery and shortage of time the sowing period had to be extended into January 2019. Many seeds were from the southern hemisphere and not otherwise available.

The substrate for sowing was and is fine grade commercial compost made of milled composted bark which turned out to be very standardized and which has a stable structure, at the same time sufficient water holding capacity and good drainage. This compost is mixed with about 25% sharp washed

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Raising a Bulb Collection—McGary *cont'd*

covered with extra soil mix. Some small seeds, particularly *Crocus*, also benefit from deeper planting. Some growers plant flat seeds like those of *Lilium* and *Fritillaria* on their edges, but others think this is unnecessary.

Care before germination. Keep the pots slightly moist and unfrozen, in full light. Protect them from rodents. Examine them frequently and move young seedlings into a well-protected place with strong light. Seeds of many bulbs,



Pots sown with 1/4 10 topping rather than pumice.

especially *Cyclamen*, fall-flowering *Crocus*, and western North Americans (notably *Brodiaea* and related genera) germinate in the fall. Pots containing ungerminated seed of dry-summer species can be allowed to dry out somewhat in summer, with watering resumed in fall.

Care after germination. This is a tricky period for the young bulbs. Provide as much sunlight as possible during winter, but shade them in summer (in nature, they would probably be shaded by larger plants). Watch carefully for aphids, which are especially attracted to *Iris*, *Crocus*, and other *Iris* family members. You can remove a few aphids by hand, but I use a systemic granular insecticide applied to the soil. I don't recommend spraying any product (even "organic" ones) on new seedlings. Another problem is damping off, especially in *Calochortus*; I don't know of any effective treatment, and the best way to avoid it is to sow seeds thinly, grow your *Calochortus* seedlings as cold as possible without freezing them, and maintain air movement. Naturally, protect the seedlings from slugs, snails, and other plant predators.

Apply a liquid fertilizer, diluted to about half the strength recommended by the manufacturer,

to the seedlings two or three times during their growing season. Some growers add a small amount of superphosphate to the seed soil mix.

Keep the seedlings moist but not soaking wet as long as they are growing strongly. Eventually they will approach their natural dormancy and begin to yellow. Unless they're plants of constantly moist habitats (e.g., *Fritillaria meleagris*), reduce watering at this time and put the pots in a dry, shady position; I cover them with mesh-bottom flats and leave them out of sunlight. You can also cover trays of seedling pots with sheets of Styrofoam used as building insulation, which helps greatly to protect young bulbs from desiccation.

Moving on. Growers differ in when they transplant seedling bulbs into a new growing medium. I like to repot many kinds after their first year, but I leave *Crocus* and most *Calochortus* species in their seed pots for two years to develop corms large enough to handle easily. It can depend on space available. Let the seed pot's soil dry out so you can spot the young bulbs. Some will be obvious, others not. If you can't see any bulbs, don't despair; just put the soil back into the pot and set it with your ungerminated seed pots, and perhaps another cohort of seeds will sprout next year. When I find only a few bulbs in a seed pot, I top up their new pot with the soil from the seed pot, and often there are more seedlings to follow. I also fill in between the pots in my bulb house with soil from harvested or completely failed seed pots, and sometimes this "last chance" produces plants.

To pot on the bulbs, fill your growing pot (because I plunge the pots in sand, I prefer clay but also use plastic mesh "aquatic" pots) almost up to the intended surface level and distribute the little bulbs on it. They don't need to be very deep at this time – one inch (2.5 cm) below the surface is fine for most kinds, unless you find them at the bottom of the seed pot. Cover them with more of the soil mix you've chosen, and mulch with grit if you wish. I use a soil mix of two parts coarse, sharp sand, one part ground pumice, and one part topsoil.

It can be difficult to tell which end is up when dealing with seedling bulbs, but the good news is that in most cases it doesn't matter; they'll figure it out for themselves. Some, such as *Narcissus* and *Erythronium*, are vertically elongated and

Raising a Bulb Collection—McGary *cont'd*

should be oriented properly. Others, such as *Allium* and Old World *Fritillaria*, make little round bulblets that seem to cope well with being sown at random. Crocus cormlets can also be “sown.” The roots will plunge downward and the stem upward, and in another year the bulb will be positioned normally.

Keep the young bulbs in pots until you feel they’re mature enough to go into the garden. If you’re putting them in troughs, they can go directly from seed pot to trough as long as they won’t be overwhelmed by other plants while tiny. I believe that bulbs grown in pots are best plunged in some well-draining medium, preferably sand. If, however, you’re growing them in solid plastic pots, plunging is not necessarily beneficial; most growers just stand them on a bench, perhaps on a layer of sand or gravel.

Notes on genera

Following are some observations on seed growing of individual genera of winter-hardy geophytes, including some dicots often included in bulb collections.

***Allium*.** Almost all are easy from seed, which is available in great quantity and variety through exchanges. Most germinate within 3 months from fall to winter sowing. The tiniest species, many from the American West, should be left in seed pots 2 years, but most can be identified and replanted during their first dormancy. Some species are summer-growers (e.g. *A. cernuum*, *A. cyaneum*) and should be grown like herbaceous perennials rather than summer-dormant bulbs. Many species flower in 3 years from sowing.

***Astroemeria*.** Not a bulb, but often grown in collections of geophytes. The seeds appear to benefit from a period of warm dry storage before sowing. Germination occurs in cool, moist conditions, usually within one year. Seedlings can be transplanted carefully when they have 4 leaves. Don’t leave multiple seedlings in a single pot for too long, since the brittle roots will be difficult to disentangle.

***Anemone*.** Species with “cottony” seeds coated in fluff tend to remain viable in storage, but those with smooth seeds usually do not. Germination of stored seed can be erratic, with seedlings appearing sometimes after 3 years, so keep the pots. Do not dry out the young seedlings completely after they go dormant. They can be potted on while in new growth the second year after germination, or, if the seed pot contains only one or two plants (as often happens), simply remove the entire soil mass into a larger pot of growing mix, or a rock garden site, while the

plant is dormant, setting it at about the same level in the soil.

***Arum*.** Plant the large seeds well down in the pot. Germination can be erratic over several years. The young tubers are easily identified and should be potted on after one year, because they will enlarge rapidly. The top of the tuber has a little, folded-over “topknot.”

***Bellevalia*.** Easy from seed, flowering in 3 years. The lovely turquoise *B. forniculata* should not be dried out completely at any time of year. The young bulbs are usually glossy white and should be planted with the narrow end upward.

***Biarum*.** See *Arum*. Germination in this genus seems better than in *Arum*, and flowering can occur in 4 years from sowing.

***Brodiaea*.** Germinates at a high rate within 3 to 5 months of fall planting, often within weeks if the seeds have been stored for any time. Seeds remain viable for many years in dry storage, whether or not temperature-controlled. Small brown bulblets are readily identifiable. Flowering takes 3 to 4 years from sowing. Give large species plenty of depth.

***Calochortus*.** Seeds remain viable a long time in dry storage. Most species germinate well within 3–5 months. Sow thinly to help prevent damping off, a common problem, and keep the seedlings as cool as possible without freezing them. Most species, other than the largest and most vigorous, are best left in the seed pot for 2–3 years. The bulblets are brown, fibrous-appearing, and much elongated, and should be planted about three times their length deep in the soil. Flowering typically takes 4 to 5 years, sometimes less in *C. venustus* and its close relatives.

***Chionodoxa*.** Germination is fairly high, with most bulbs flowering in 3 years.

***Colchicum*.** Plant seed fresh if possible. Stored seed germinates very erratically, if at all; keep seed pots up to 5 years. Germination appears to be environmentally triggered, as typically several species from several years’ sowing will germinate within days of one another, often in a midwinter warm spell. The seeds tend to rise to the surface, so plant them rather deep with plenty of grit top-dressing. Small species can flower in 4 years from germination, larger ones perhaps taking longer. Growing colchicums from seed is only for the patient and expense-tolerant.

***Corydalis*.** Fresh seed germinates far better than

Raising a Bulb Collection—McGary *cont'd*

stored seed in most species, and seeds can be damaged by rough handling in the mail, so this is another gamble. Nevertheless, a small number of seeds, even from stored stock, may germinate. The seed pots should not be dried out severely, even with dry-summer dwellers, and plants should be left in the seed pots for 2 years.

Crocus. Germinates fairly well, usually at the time of year the species would normally begin foliage growth. Plant the seeds deeper than you would normally place such small seeds, because a radicle (first root) emerges first and can push up above the surface if the seed (which is on the tip of the radicle) is placed too shallowly. The leaf emerges a little later, but in the same season. The seedling corms are mostly very small. Flowering takes 3 to 4 years.

Cyclamen. Fresh seed germinates much better than stored seed, but enough germination can be obtained from stored seed to make it worth a try. Germination is somewhat erratic. Tubers are identifiable after one year but can be left in the seed pot two or three years to advantage, unless very crowded. Do not let the dormant tubers dry out severely, but don't keep them too moist either when it is hot, and keep them in the shade. John Lonsdale, who has an extensive collection of this genus, covers dormant pots of all *Cyclamen* species except *graecum*, *persicum* and *rohlfianum* with Styrofoam sheets.

Dichelostemma. See *Brodiaea*.

Erythronium. Eurasian and eastern American species' seed should be planted fresh; most western American species' (except perhaps *E. revolutum*) seed remains viable in dry storage for at least one year. Germination of the latter from fall planting is high, and bulblets can be moved on during their first dormancy. They are elongated, and the larger end, usually lighter in color, is the bottom. No species should be "baked." Some flower in 3 years, most in 4 to 5.

Fritillaria. A few species (*F. meleagris*, *F. camtschaticensis*, and possibly other East Asian na-

tives) have short seed viability and must be planted fresh and not allowed to dry out completely at any time. Other species remain viable in dry storage for one year, with germination rates diminishing greatly thereafter. Some growers plant the seeds "on edge," but I don't find this necessary. Germination of Old World species usually occurs 3–5 months after sowing, but North American species planted in fall often germinate quickly. Bulblets can be left in the seed pots for 2 years, but they are easily identified unless you use perlite in the mix (they look like slightly irregular pearls). Fertilizing is especially beneficial in this genus, but use a dilute strength.

Galanthus. Snowdrop seeds apparently do not remain viable in storage and should be planted immediately after ripening. After germination, do not allow the pots to dry out completely, and keep them in a cool site even while dormant. Keep in seed pots for 2 years.

Gladiolus. I grow mostly the hardy Eurasian species, very easy from seed, germinating copiously and flowering in 3–4 years. The small, elongated, brown first-year bulblets are hard to identify, so

leave them in the seed pots 2 years, providing ample fertilizer.

Gymnospermium. This tuberous member of the Podophyllaceae is popular with bulb collectors and can be increased only via seeds. Plant the large seeds at a good depth in a well-drained soil mix. The young tubers are light brown and easily identified. This is a fairly large plant, so move them on to a pot with plenty of depth after one year. The seeds

have elaiosomes eaten by ants, and volunteers often appear some distance from the parent plants.

Iris. Growing irises of the Reticulata section from seed is a good choice, because they germinate readily, reach flowering size relatively quickly, and can thus be freed of the prevalent Ink Spot disease (as long as you keep them away from commercial Reticulata bulbs). First-year bulblets are quite small. Also popular with bulb enthusiasts are members of the Scorpiris (Juno) and



Erythronium seedlings, second year.

Raising a Bulb Collection—McGary *cont'd*

Oncocyclus sections. The large seeds should be sown deeply and germinate erratically over several years. Handle the young dormant plants very carefully so as not to damage the developing storage roots.

Leucojum. Many former members of this genus have been moved to *Acis*, and it is in the latter genus that we find those most likely to have storage-tolerant seeds; *L. vernum* and *L. aestivale* should be sown fresh. The *Acis* species (including the much-grown former *L. autumnale*) tolerate dry dormancy and germinate readily. Seedlings are small.

Lilium. The growing requirements of this huge genus are too varied to condense here. For details see Edward McRae's book *Lilies: A Guide for Growers and Collectors* (Timber Press, 1998). Because viruses are such a severe problem in lilies, growing species from seed is strongly recommended.

Muscari. Most are very easy from seed, forming good-sized first-year bulblets, usually glossy white with an obvious enlarged base.

Narcissus. A top choice for seed growers. Seed germinates readily and produces easily identified brown, elongated bulblets the first year. Don't dry them out completely. Smaller species can flower the third year. Garden-collected seed is likely to produce hybrids unless the stock is carefully hand-pollinated.

Ornithogalum. Another easy genus that can be moved on during its first dormancy.

Scilla. Most germinate readily the first year and can be moved after one season.

Sternbergia. Import restrictions make this a genus needing seed propagation. Germination can be erratic, suggesting that seeds be planted fresh even though sternbergias come from dry-summer regions. The brown bulblets develop quickly.

Triteleia. See *Brodiaea*.

Tulipa. Germination is usually moderately successful, but you may wait many years for flowers. A few species (e.g., *T. cretica*, *T. sylvestris*) flower when fairly young. Move the bulblets on to pots with plenty of depth. Another genus where widespread virus disease in commercial stocks makes seed growing desirable.

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Propagating Rain Lily Seeds in Water

Yet another method of propagation which appears to be especially useful for thin or flat papery seeds is water sowing. The following information provides the basics of this form of propagation but more information can be found on the Pacific Bulb Society's wiki. Although rain lilies are specifically mentioned, other flat papery seeds such as lilies and Amaryllids may also be propagated using this method.

The most easily acquired containers for this method are clear or almost clear plastic containers with lids from the deli, small ketchup cups or other condiment cups with lids from fast food places for small amounts of seed, or clear plastic drink cups. Punch a small hole in the lid with an awl or nail. Use cool tap water and dump in the seeds, then cover with the perforated lid, plastic bags or saran wrap or similar. Fish out any non-seed pieces as these typically rot.

Put containers in light but not direct sun. Moderate temperature is not an issue for rain lilies according to Rimmer deVries, but should not be too hot or too cold. Rimmer starts his on a shaded porch in summer, and in the garage or house in winter. If the water turns color or if you see mold, flush and replace the water and remove the mold. Also an effective preventative measure is to put a drop of bleach and a drop of dish liquid (only a drop each – more is not better) if the water you are using is from a non-municipal water system or from bottled or distilled water. Most municipal water systems, if not all, have some residual amount of chlorine remaining which tends to kill detrimental bacterial or other agents that might harm the seeds.



Ecrosia seeds sprouting in water.

Rain lily germination takes a few days to two weeks, some longer. The generic term 'rain lilies' refers commonly to *Zephyranthes*, *Cooperia* or *Habranthus* genera. Fresh seed is faster than old seed. When you see a radical or even later a true leaf, you can plant in your medium. Rimmer waters in with a mist bottle on me-

Growing Bulbs—Urban *cont'd*

sand and after sowing the pot is covered with a layer of the same sand. This mix has proved successful. The pots were placed outdoors exposed to wind and sun but sheltered with old cold frame windows against our heavy winter rains. Temperatures were fluctuating but no artificial heat was applied. The trickier seeds (apart from bulbs I also - tried *Protea*, *Pelargonium*, *Erica* and *Restio* seeds) were sown in a mix of 60% burnt soil (collected after the forest fire that raged in summer 2018) and 20% each of the same standard compost and sand.

Both compost mixes produced excellent germination, even in the smoke or fire dependent seeds.

The autumn 2017 sowings of *Cyclamen persicum*, *graecum* and *hederifolium* were lost to a large extend during their first dormancy. Although

they were watered regularly many tubers shriveled so much that they rotted at the onset of winter rain. So

last autumn I used perforated seed trays of strong black plastic sized 45x33 cm, 7,5 cm (18x14x3.5 inches) deep. *Cyclamen* seed is routinely soaked overnight with a drop of dish washing liquid and then sown. Excellent germination and growth lead to strong tubers to enter dormancy. These trays were never exposed to full sun; they later went under shade cloth and were placed in full shade once dormant and -hand watered more frequently every two weeks with a very fine rose. Look at the picture how well they started this autumn; they were exactly one year old when photographed. Surprisingly those tubers around the rim started first and there were no losses.

After germination when growth had set in, the seedlings were fertilized several times with

about half of the recommended strength of a balanced high potash fertilizer. Most seedlings reacted almost immediately to being fertilized, showing a new set of leaves or stronger growth. I had to learn from other plants that the milled bark compost is relatively low in nutrients.

Then came spring with warmer temperatures and stronger sun. I removed the frame windows in order to prevent unnecessary heat behind the glass. Later I moved the crates with the pots into a shady position and/or covered with a 50% shade cloth or garden fleece in order to keep them green as long as possible. Of course they were very carefully hand watered at this stage. Those that had already gone dormant were removed from the collectively watered crates in order to prevent rot due to excess water. This way some of the seedlings stayed green for quite a long time into early summer and some even remained evergreen during their first “dormancy”.

During our hot Mediterranean summer these crates were moved into the shade under our cork oaks. Now the advantage of the new square pots was that they snugly sat in their crates and held almost double the volume of compost compared to the 3-inch round pots so the compost was less exposed to extremes. The tightly fitting pots protected each other from sun; the white sand reflects the light and the bigger volume dried out much slower than in 3-inch round pots with more air circulation around them. The dormant bulbs received a hand watering with the same fine rose about every 4 weeks. Those that seemed to need more water like evergreen *Veltheimia* and *Albuca* seedlings were grouped in separate crates and watered more often and with more water. But even with this regime there were losses. I was given seed of *Paeonia mascula* which germinated well but the seedlings



Cyclamen seedlings at one year. Right: Pots in perforated crates.

Propagating Rain Lily Seeds *cont'd*

dium flow stream and keeps up the humidity until they seem to have taken root. Then take off covering, but leave in same location for a week or so to harden off a bit and show a bit of top growth, then they are ready for a shady humid position outside. In a year or two the rain lilies will outgrow the 4-inch pot and bloom. Some will bloom faster like *Habranthus tubispathus* and show up when you don't expect it.

Both Rimmer and Lee Poulsen have tested this water method side by side with pre-moistened seed starting mix (one deliberately and one by accident) while controlling humidity. The water method is far superior with very little rot, except that old dead seed will rot. Lee suggests that old seed of questionable viability is more likely to germinate in water rather than in soil mix where it is exposed to possible microbes.



Some flat paper seed like tulips, fritillaries and some lilies (Martagons, Caucasians, Japanese, Korean, Chinese mountain lilies, and American natives and hybrids) need cool to cold or fluctuating temps to germinate so these should be started

in water in the fall and left in a place that gets colder at night and warms up in the day, but not in direct sun. Some don't even need or want light to germinate. You can use the refrigerator for 3-4 months for a cold period any time of the year but don't put seed near fruit; the ethylene gas given off by fruit will kill the seed.

Moist paper towels in a zip lock bag in the refrigerator also work but you need to monitor them so they don't grow through the paper or start leaves without light. (This happened to *Corydalis* seed mailed to Robin in damp vermiculite – it was sprouting when received.)

Ed.: Rimmer deVries, Lee Poulsen, Robin Hansen. Photos: Rimmer deVries.

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Treasurer's Report for 2017—Arnold Tractenberg

	3rd Quarter	
Balance Oct. 1 2019	\$	37,542.55
U.S. Members	\$	350.00
Overseas Members	\$	300.00
BX Receipts	\$	575.00
Investment results	\$	118.72
INCOME	\$	1,343.72
BX/SX Postage Domestic	\$	(146.99)
BX/SX Postage International	\$	(304.77)
BX/SX Supplies	\$	(140.57)
BX Helper	\$	-
Board Conference call	\$	(111.58)
Treasurer's Supplies	\$	(217.00)
Publications	\$	(1,310.00)
Accountants fee	\$	-
Publication postage	\$	(684.83)
PayPal expense	\$	(66.03)
Membership Directory editing	\$	-
Bulb Garden editing	\$	(700.00)
EXPENSES	\$	(3,681.77)
Balance Sept. 30, 2019	\$	35,204.50

Board Nominating Committee Report

October 13 2019 meeting minutes are not available yet. However, new PBS board officers have been elected to serve two-year terms and they are as follows:

- President: Robin Hansen (new)
- Vice-president: John Wickham (re-elected)
- Secretary: Kathy Andersen (re-elected)
- Treasurer: Arnold Trachtenberg (re-elected)

--Thanks to the Nominating Committee: Lee Poulsen, Jim McKenney and Arnold Trachtenberg, Chair, for their work in assembling the slate.

WANTED

MEMBERS TO MANAGE THE BULB & SEED EXCHANGE. APPLY BY EMAIL TO ANY BOARD MEMBER (not to the list)

Growing Bulbs—Urban *cont'd*

became too dry in summer and died. And to my shame I lost all my *Protea* and *Erica* seedlings because they became too dry as well.

What is the lesson to be learnt from failure and success? It is pot size and timing that matters. So this autumn I used the same square plastic pots like I did last year but for some seed I now use big pots of 20 cm (8-inch) diameter or even more. The biggest pot size is 8 litres (approx. two gallons). Why this new strategy? I found Ranunculaceae seedlings most difficult to get through their first dormancy; *Paeonia*, *Anemone coronaria* and *Ranunculus asiaticus* were mostly lost, especially in the 3-inch pots. And there is another reason for big pots. When the winter rains set in there was surprisingly vigorous growth in many of the square pots of last year's seedlings. I had not removed the seedling bulbs from their pots during dormancy because I was scared they might be so small that I would lose them in the process as I NEVER reuse my compost. But with such dense foliage in a relatively small pot I decided to repot them in full growth. I had never done this before. So... the first plants were not so valuable and were known to be robust. They exploded into growth after being repotted into new compost so I got more courageous. In order to reduce the number of pots and at the same time to let them have big pots I plant up to four different species into one big pot. No loss or damage whatsoever has occurred in these repotted seedling bulbs. I pay attention that the bulbs/tubers/corms of these plants can easily be distinguished in their dormant state in order to avoid confusion at a later date. For example *Scilla* with an Irid and an Aroid. Or a low growing oxalis with *Lachenalia* and crocus or narcissus. I have been planting more than one species of bulbs per pot for quite some time and find this very successful. I put notes on the labels in case one wants to outgrow the other but even in this

case the resulting bulbs are of good size. But still next season there will be a different combination. No plant grows on its own in nature.

Timing is another important factor. Very clearly those seeds sown early made the better bulbs compared to those sown later. I prefer to store seed in my seed fridge until next season if it arrives after January following the advice of Rachel Saunders. Except for seed that needs immediate sowing. This year the first sowings were made at the end of September when the weather was still hot. But the pots were placed in the shade and watered carefully and six weeks later the seedlings stand 5 cm (2 inches) tall and grow

very vigorously. In this case they are *Free-sia* Hybrids and *Ixia viridiflora*.

The crates are covered with a fine wire mesh



Left: Pot with several different taxa. Above: Using large pots for difficult species.

to prevent animals from digging the seed pots.

This autumn two different seeds were sown together early in one big pot for the first time. This is experimental but so far it looks good. It is *Scilla peruviana* together with *Ranunculus asiaticus*. Both have germinated simultaneously and both stay green for a fairly long time in spring and both do not like drying out brutally. They will remain in their big pot for two seasons.

Also for the first time the seed pots were not covered with the frame windows but left exposed to rain as well. This way they remain slightly cooler. Even with free circulation of air the windows produced more heat under the glass than without cover. So far there have not been any problems with washed out seeds due to heavy rain. But the

Growing Bulbs—Urban *cont'd*

windows are standing by. Only *Ornithogalum rich-
tersveldense* is under cover, the adult plants are not
used to so much rain.

More finely structured seedlings like *Gladiolus*
species or *Ornithogalum dubium* are not being repot-
ted. They remain in their square plastic pots for an-
other season and will be fertilized again during
growth.

There is one trap to be avoided. We had a sur-
prisingly early good downpour on September 21st
when the weather was still hot and the bulbs were
still dormant. But as the pots stood outside they got
wet. This meant that they would break dormancy
and start root growth. Which meant that they needed
very careful monitoring for moisture. They were not
allowed to go completely dry again because this
would have killed the new roots. But too much water
in warm conditions can also be a problem... As soon
as the temperatures dropped and winter rain set in
regularly the problem was solved and growth began.

In general I am more than surprised how big the
one-year-old bulbs have grown in just one season.
On repotting in full growth both the roots and the
young bulbs can be seen (the root ball is not undone)
Probably the effort made to keep them green as long
as possible using shade cloth and careful repeated
fertilizing is paying off now. Especially *Lachenalia*
species make quite broad leaves in their second sea-
son so that there is hope for flowers next season if
no disaster strikes... like hoards of hungry snails...



Above: Seedlings ready for repot-
ting. Above right: The author.
Photos: Johannes-Ulrich Urban.



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You can also mail in your renewal. Please
direct it to Arnold Trachtenberg, 140 Lakeview
Avenue, Leonia NJ 07605

Whether renewing online or by mail, please contact Jane
McGary (janemcgary@earthlink.net) if any of your contact
information has changed.

**Thanks again for your continued support of
the Pacific Bulb Society!**

**DON'T FORGET GRANT APPLICATIONS WILL BE
DUE IN EARLY SPRING. CONTACT THE PBS
BOARD SOON.**

Arnold Trachtenberg
140 Lakeview Avenue
Leonia NJ 07605

www.pacificbulbsociety.org

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Gardening with Bulbs



Calochortus tolmei. Photo: Robin Hansen.

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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.

Editor: Robin Hansen, robin@hansennursery.com; Co-Editor: Jennifer Hildebrand

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