



## BULB LOG 06.....7<sup>th</sup> February 2008

### CULTIVATING ERYTHRONIUMS

It is a fact of life that is not likely to change in the near future that it is difficult to get hold of many of the species and varieties of Erythronium, and when you do find them they are going to be expensive. The way I have built up our collection is by raising the majority of them from seed, only reverting to buying bulbs when I want a particular cultivar or a difficult to get species and then my first task is to get it into flower and get a crop of seed from it. I collect most of the seed from our own plants when it ripens in June/July unless it is in one of the top beds under large rhododendrons where I want them to self sow and naturalise. I remember the time when I first got interested in rock gardens and was visiting some of the better established gardens of those days, how impressed I was when I saw plants self seeding all around. I used to wonder why this did not happen in our garden until I realised that I was collecting all the seed to either sow in pots or to send into the SRGC Seed Exchange. The answer was blindingly obvious and so it is with many of the other challenges and problems we are faced with when cultivating plants; as gardeners we have to learn to think laterally and observe our plants carefully.



**Collecting seeds**

I mostly collect the Erythronium seeds by cutting the stem complete with their seed heads just as the first ones have opened, even though others may still be green, the seed is fully formed. I then place them upside down in paper bags which I store in a shaded shed that is not subjected to high temperature swings. Why don't I copy nature and sow them immediately they are ripe? Well, thinking laterally, I am copying nature because in the wild habitat the erythronium seed is shed as the capsule splits into the climate it has evolved to cope with – generally a hot dry summer. The summer in North East Scotland cannot be described as hot and dry, it is often cool and wet and seed sown into pots left outside in these conditions are subjected to many forms of bacterial and fungal rot. I have experimented and get far better results by storing the seeds in the paper bags through the summer months. The seed that I let shed naturally in the garden beds does germinate well enough and we have a good population coming along but there are two points to be aware of here. Firstly the conditions in an open well drained garden bed under

trees and rhododendrons are very different to the conditions in a plastic pot and secondly, large quantities of seeds are shed in this bed and we are less aware that many probably do not germinate than we are when we grow them in a pot and have a high expectation of germination.



**Dry stored seed**

Having stored the seed over the summer in paper bags it is best to sow it in September or October but before this I soak the seed for a day in a little water to rehydrate it – it is amazing how it plumps up and this gives a better rate of germination in the first spring.



**Soaked and unsoaked erythronium seed**

Generally if we are getting seed from a seed exchange or buying some from a specialist seed merchant it can be as late as February when we receive it but I go through the same process of soaking and sowing it as soon as possible. I have written a lot about sowing certain types of bulb seed at depth to get best results but erythronium seed should be sown on the surface and only covered with a few centimetres of gravel. In my experiments of sowing erythronium deeper than this I got little or no germination and I wonder if the seed requires light to germinate.

Thinking about how the seed is shed and distributed in the wild gives the biggest clue as to whether to surface sow or sow at depth. As the erythronium seed capsule dries it only splits towards the top and the dry stem becomes quite rigid causing it spring back quickly to an upright position when it is bent by a strong gust of wind or passing animal, scattering the seed nearest the top in a catapult like fashion as it does. Unlike narcissus or crocus seeds the erythronium seed has no sweet attachment to encourage insects to take and distribute it and so the distribution is limited to the distance the catapult action can hurl it. I have measured the distance that the seed can be catapulted and 2 meters is a reasonable distance for it to achieve and if we take five years for that seed to germinate and reach flowering size before it can shed its seed another 2 meters we can work out that it would take at least 250 years for the plant to extend its range by 1km if all conditions were favourable. Any geographical barriers like rivers would also restrict the distribution of a plant with such a limited method of spreading its seed and these factors go along way to explaining why so many erythronium species have very restricted distributions in the wild before we even look at other factors such as habitat and climate.

I use our standard well drained compost made up of two parts loam, one part leaf mould and two parts 6mm grit to which I add a scattering of bone meal to provide some slow release nitrogen. I fill the pot to about 2cms from the top, scatter the seed and then fill the pot to the top with 6mm grit. The seed pots are then placed on a bed of sand in a plunge that is open to all the weather through the winter, I only place a cover over it when bad weather and snow arrive in the spring if the seed has started to germinate.



#### **seed germinating**

When the seed germinates it puts down a root and sends up its first leaf, then a stem- like structure pushes down into the compost and the young bulb forms towards the bottom of this structure. Do not replot the seedlings until after their second year of growth at least, by which time they will have taken themselves even deeper into the compost. Because they are still taking themselves deeper into the compost the bulbs will often be very long narrow and delicate structures so handle them with great care. If you should break one, which is almost inevitable when handling quantities, plant both bits and at least one will grow on. Because the bulbs like to be planted deeply I prefer to use a range of plastic pots that are 12cms deep.

Even with these deeper pots some species of erythronium will try and escape through the bottom in their second year.

I generally replot at the end of the third year of growth by which time the bulbs will all be at the very bottom of the pot and will be a reasonably good size to handle. At this stage I have two options: plant them directly into the garden or replot the bulbs into fresh compost. Sometimes due to the large number of bulbs we grow in pots we run out of time and do not get around to replotting some of the erythroniums until they have reached flowering size, this can take between five and seven years. It is not until year three that you will start to see any leaf patination appearing on those species that display that feature and the true extent of the leaf markings will not develop until the bulbs are five years old.

The first flowers can appear as early as the third year but that is exceptional and very few will reward you this quickly, a good target is to aim to get flowering sized bulbs in years five to seven.

## Bulb Increase

While some *Erythronium* species, like *E. tuolumnense*, do increase well vegetatively the majority of them increase very slowly this way and some never split. The other extreme is found in some of the species from Eastern America, such as *E. americanum*, which reproduce by sending out stolons at the end of which a new small bulb will form. The problem with some of these plants is that in certain conditions they concentrate all their energy on sending out stolons and very few flowering sized bulbs will form. There are many tales about how to prevent them behaving in this way and make them flower well each year, such as bury them very deep, place a stone underneath them to prevent them going too deep, none of this is helpful advice. There are some forms that will produce a good display of flowers every year and others that produce masses of single leaves and only an occasional flower. Plant them into a bed filled with a good well drained humus-rich compost, preferably fortified with well rotted farmyard manure and/or leaf mould, then you will stand the best chance of getting these reluctant forms to flower.

*Erythronium* 'White Beauty' is one of the most reliable of all when it comes to division of the bulb; a single bulb can produce up to five offsets in a single year resulting in two, occasionally three, flowering sized bulbs and the others will flower after one year. *Erythroniums* that form clumps are best divided every three to five years to prevent the clumps becoming too congested which, if it does happen, will result in a reduction in the number of flowers you get.



### clump forming bulbs

New offset bulbs form in two ways: the largest bulbs will form at the base of the old stem where the roots emerge and when growing conditions are favourable smaller offset bulbs sometimes also occur further up the stem, the old bulb from the previous year is completely used up in most cases.



**Dens canis bulbs showing chains**

When we look at *Erythronium dens-canis* and its relatives we find that the old bulbs do not disappear completely, leaving a small remnant of the old bulb attached to the base of the new one and after a number of years you can find a chain-like structure made from of a series of these past years' bulbs.



**New bulbs on chain links**

As long as these chains remain attached to the main bulb they will remain dormant but if you remove them and split them down into individual links and grow them on, as you would a normal bulb, then each link will form at least one new bulb.



**New bulbs forming on *E. montanum* chain**

You will also find that a few of the Western North American species such as *Erythronium montanum* also exhibit this chain-like structure.

### **Growing in pots**

Once the bulbs are mature they can continue to be grown in pots provided you can keep them cool in the summer time. Erythroniums can tolerate dry periods during their dormancy but they respond very badly to being too hot and they hate to be out of the soil for any length of time. This should be no surprise when you see the depth that the bulbs take themselves down to in the wild and the open garden, they are going down to a layer that is more stable and does not heat up too much in the summer months. I like to repot mature bulbs every second year not just to get them into fresh compost but to prevent them escaping through the drainage holes in the bottom of the pots into the sand plunge below.



**Bulb escaping through bottom of pot**

When I lift a pot from the sand plunge I always look at the bottom first to see if there are any bulbs sticking out through the holes, then I probe the sand below the pot to look for the ones that have already escaped into the plunge. I should mention that there is some disagreement as to whether an erythronium is a bulb or a corm, I think it is in between as it displays properties of both types of structure but I will continue to call it a 'bulb' for the purposes of this article. One thing it does do is renew itself every year and sometimes a new bulb forms half in and half out of the pot and because it is fatter above and below the hole it is impossible to pull it out without either breaking the bulb or carefully cutting the plastic pot open. As I have already mentioned if you do ever break or cut an erythronium bulb into two bits just plant all the bits and at least one part will grow. I also use 29cm deep polystyrene boxes, suitably carved and painted to look like a trough, for growing erythroniums in: especially clump forming ones that I want to split up every year to maximise the rate of increase. If I have a large quantity of seed of any one species I will sow it directly into one of these deep boxes where it can grow until the bulbs all reach flowering size.

## MESH BASKETS



**mesh basket**

My favoured container for growing erythroniums are the deepest mesh pond baskets that I can find. These baskets are made for aquatic plants and have a very fine mesh that allows roots and moisture through but not the bulbs. Well, most bulbs that is; there are always a few that will try and escape downwards by pushing through even the smallest of holes (1mm) in the mesh. I have a large number of these baskets which are filled with the standard compost described above and sunk into sand plunges. This makes it very easy to lift and replot the bulbs, ideally every two years but more realistically it is every three or four years. When I do replot rather than replacing the compost completely, I often just refresh the compost by adding one fifth by volume of leaf mould and a small amount of bone meal ensuring it is well mixed through. I like to add leaf mould because it is full of nutrients and trace elements rather than peat which is not only pretty inert but some erythronium species seem to actively dislike too much peat.



**mesh baskets in sand plunge**

All the erythroniums we have growing in pots or mesh baskets are left open for most of the year. The only times I will cover them is early in the year when they are starting to germinate for the seedlings and when they are in flower for some of the rarer flowering bulbs. I have discovered that a simple cover about 1 meter above the flowering bulbs greatly improves the pollination and so I get a better seed set.

In the years that we do not get round to repotting them I will scatter some bone meal over the pots and baskets in the late Autumn and add a sprinkling of sulphate of potash when the flowers fade in the spring making sure that it is well watered in.

### **GROWING IN THE GARDEN**

As to the best conditions for planting them straight into the garden we are very lucky. We have a well drained sandy loam sitting over granitic (and so slightly acid) rock, to which we have added a great deal of organic matter over the years mostly in the form of garden compost made from shredded prunings and hedge trimmings and of course leaf mould. Also, our moderate climate with summer temperatures rarely reaching the mid twenties, we briefly hit an all time record of 29.4C this summer and with the average winter temperatures not going much below -10C along with an average rainfall of approximately 1000mm, all makes for good growing conditions for erythroniums. You should plant the bulbs of the Western North American species at a good depth, covering the bulb by at least 10 to 15 cms; the Eastern North American species such as *albidum* and *americanum* along with the Eurasian ones related to *E. dens canis* do not require to be planted quite so deep as that, a covering of 7 to 8cms will do for them.



**garden bed**

We have them planted both in full sun and shade to good effect and certainly in the North of Scotland there is not much need to protect the leaves from the sun but the one thing they do not like is wind. Even a mild gusty day can cause devastating damage to many of their leaves which, like many *Trillium* species, are not designed to cope with gusty conditions.

After a number of years clump forming species and hybrids will need lifting and splitting as the amount of flowers starts to drop off from the intense competition. I am always amazed at how many bulbs of the clump forming *Erythronium* 'White Beauty' or *E. tuolumnense* you get when you do split up a clump; I only wish that all erythroniums would increase themselves so readily. The best time to dig and divide up a clump in the garden is just as the leaves start to turn yellow and you are guided down to the bulbs by their stems. Where possible dig a deep hole close to the clump and I mean at least 30cms deep, then carefully excavate sideways towards the clump until you find a bulb; this will give you an indication if you are down deep enough to get a spade or fork underneath them and prise the bulbs out. Once you have them lifted it is easy to separate them and replant in several groups. I always work some garden compost or leaf mould into the bottom of the hole before I plant the bulbs.

Unfortunately not all erythroniums increase at any speed, we have some species that have not increased vegetatively in 15 years and this is why getting a good seed set is so important. One of the main reasons that I raise so many erythroniums from seed is I am always hopeful that I will get a clump forming clone of some of the species that are so reluctant to make offsets. I have had some success with *Erythronium revolutum* but unfortunately the forms that increase vegetatively do not have the best leaves or flowers so I have to cross them with forms that do and hope that somewhere down the line we will get the best of both. I am convinced that this program of selection can succeed despite the fact that so many bulbs seen in the wild grow as individuals and only very few clumps are seen. Clump forming genes must be present in all erythroniums and when a clump forming type does occur in the wild it will be at a disadvantage; as the bulbs split and increase in number, becoming congested, they will be in direct competition with each other for any moisture and food and so they will slowly starve in their fight for survival, unlike the sole bulb that has no close competition. If however this clump forming type had been collected and brought into cultivation it has a big advantage and is much more likely to survive than the non splitting type and the reason for this is that the grower will lift and split the clump on a regular basis, spreading it around and sharing it with friends and so it increases rapidly like the excellent *Erythronium* 'White Beauty'.