Triffid Nurseries

Seed Germination Guide

Our seed is freshly collected and stored under optimum conditions of low temperature and humidity to ensure that it reaches you in the best possible condition. Due to the nature of many species and variations in cultivation conditions, successful germination cannot be guaranteed but we believe you will find that this seed offers the greatest chance of successfully introducing your chosen species into your collection.

Please take time to read the germination tips through - we know you want to get the best results you can from these seeds.

Some useful general information on germination and cultivation:

Use only good quality soil and clean soft water for germination and cultivation - for most Carnivorous Plants, a mix of 2 parts sphagnum moss peat to 1 part sharp sand (Standard Sowing medium) is suitable, however I have detailed other soil mixture options under the appropriate species. Rainwater is preferable to tap water, but if boiled to remove lime and chlorine prior to use, tapwater will suffice.

Almost all carnivorous plant seeds are best sown on the surface of the soil and not buried.

Allow good ventilation around the pots/seed trays to prevent the risk of mould attacking the emerging seedlings. Check the seeds regularly and apply a suitable fungicide at the first sign of mould. Most CPs will respond positively to a half strength solution of any fungicide that is not copper-based.

Allow a suitable level of light to fall on the pots/seedtrays - as a rule of thumb, seeds will respond best to similar light levels enjoyed by adult plants of the same species. The same goes for water - species that like to stand in water through the summer will germinate best in pots kept standing in water.

For many of the common species that are suitable for beginners, a sunny south-facing windowsill in a warm room is an ideal position for germination and cultivation. A bottom-heated propagator is not usually desirable, and if the pots are stood in a tray or saucer of water, propagator domes/lids should not be used for most species - ventilation will be seriously reduced, which is an open invitation for mould. The very wet nature of the soil will provide sufficient humidity.

Be patient - most species of CP have not been bred for easy germination like more traditional horticultural and agricultural crops - in some cases they may take a considerable time to germinate, e.g. some *Utricularia* spp. and tuberous *Drosera* may take over 1 year! Happily most of the commoner species will take no more than a few weeks, but it is wise not to give up hope for at least several months.

If in doubt as to the techniques detailed below, don't use them. Most species will germinate without them, and many would be harmed by inappropriate heat, smoke or chemical treatment. Stratification will cause no harm, and is recommended for all temperate species (listed under Stratification), but is not necessary for tropical or sub-tropical species

Some useful information on particular germination techniques:

Cold Stratification:

Stratification is a process whereby the seeds are exposed to cold and moisture to simulate the winter conditions that many temperate *Drosera, Pinguicula* and *Sarracenia* experience in their natural habitat. This will let the seeds know that Spring has arrived and it is time to sprout.

You may sow the seeds onto peat and sand, and leave the pots outside for the winter if your climate is suitable, but protect them from high winds, or they may well be blown away.

Alternatively, you may use a refrigerator (0-5C) to simulate these conditions - place the pots in plastic bags in the fridge for 6-8 weeks, and check weekly to ensure that they are still damp. To save space, you may wrap the seeds in wet moss or kitchen roll and seal them up in ziplok bags or similar. You may if you wish apply a weak solution of a suitable fungicide as a preventative measure, as ventilation will be greatly reduced.

After 6-8 weeks, move the pots to a warm and sunny spot to await germination.

Species which require or respond well to stratification include: *Darlingtonia californica,* all *Sarracenia* spp., *Drosera anglica, intermedia, rotundifolia, Pinguicula grandiflora, lutea, vulgaris.*

REMEMBER: You CANNOT Cold Stratify dry seeds! You must sow the seeds first, providing both moisture and cold.

In the case of *Darlingtonia californica*, snap freezing can be beneficial - this is a type of stratification where the seeds are put in a small pot (yoghurt pot or similar) of water in the freezer for 24 hours. Take out the frozen ice with the seeds and put it on the surface of the pot they are to be grown in, and allow the ice to melt. This can be followed by refrigerator stratification, or used instead of it. Do not use this method with other species - the freezer is much too cold for *Sarracenia* and *Drosera,* etc.

Hormone treatment:

Some of the more difficult species can be prompted to germinate more quickly by treating with plant hormones, notably Gibberelic Acid. Particularly tuberous *Drosera,* S.African *Drosera* like *D.alba, cistiflora, pauciflora, regia,* and *Byblis gigantea* respond well to this - soak the seeds for 24 hours in a solution of 250 ppm (i.e. 100mg GA in 400ml.water). Sow on milled live sphagnum to help prevent mould. For *B.gigantea* this is certainly the most reliable method, though great care must be taken transplanting small seedlings to soil.

Smoke treatment:

Various products are available either to burn on the seeds or to prepare a smoke solution to water over them, and good results have been reported in many cases for tuberous *Drosera, Byblis,* etc. We sell Smoke Water Papers on our website for this purpose. Burning leaf litter, eucalyptus bark/leaves or paper in the pots (see heat treatment for details) also will provide smoke.

Heat Stratification:

Some species benefit from controlled burning of leaf litter or tissue paper on the seeds - these are usually species native to areas which experience regular brush fires, e.g. some tuberous *Drosera, Byblis gigantea, Mimosa pudica.* A small pile of suitable dry material can be piled on top of the sown seeds and ignited - remove excess ashes once combustion has ceased. I prefer to use eucalyptus leaf litter for this purpose. A similar effect can be more safely obtained by watering the seeds once with boiling water immediately after sowing. If in doubt, don't use this method routinely - it is only a few species which benefit, and most CP species would be damaged or destroyed by the heat!

Scarification:

Some larger seeds may benefit from scarification - this is a process whereby the seed is chipped or filed to provide a weak spot in the tough seed case where the germination sprout can emerge. This is particularly recommended for *Drosophyllum lusitanicum.*

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More Specific advice

Dionaea muscipula **Venus Flytrap**

D.*muscipula* seeds require cold stratification. The diurnal temperature ***swing*** following a cold winter is vital to synchronising the seed and persuading it to germinate. Use the Standard Sowing Medium. Seeds germinate at temps of 15 - 25C and prefer high humidity. Transplant the seedlings when they have developed 3 - 4 leaves.

Sarracenia species **Trumpet Pitcher Plants**

Sarracenia seed requires cold stratification. Sow the seed on to the surface of a soil mix consisting of 3 parts sphagnum moss peat: 1 part sand. The seeds will germinate over a period of several months, but can take as long as 18 months!

Cephalotus follicularis **Albany Pitcher Plant**

Cephalotus seed germinated best on bed of finely chopped LIVE sphagnum moss. If live moss is not available then use compressed dried Sphagnum moss or Supersphag available on Ebay. Sprinkle seeds and spray with water. Cover to provide humidity and place in half shade in a warm greenhouse or windowsill.

Darlingtonia californica **Cobra Lily**

As above, but protect from temperatures over 30ºC and ensure roots are kept cool - use a light-coloured pot and water tray, in hot weather top-water with cold water daily.

I have had most success by sowing the seed on to pure live sphagnum moss.

Drosera species **Sundews**

Tuberous Drosera*:*

Australian Tuberous Drosera seeds can be some of the most difficult of all CP seeds to germinate! Some sps take up to 3 years to germinate but if you can crack their complex germination mechanism then the rewards are magnificent. The problem is that these seeds are designed to lay dormant in harsh Ozzy conditions, often for many years, until exactly the right combination of conditios occurs. This might be a flood, a warm night, a cold night followed by a hot day, a tropical storm or even a bush fire!! Or any combination of the above! This makes them incredibly difficult to germinate (apart from D.peltata and auriculata which are pretty easy!!) since you, the grower has to try and mimic this unknown series of conditions.

One thing I always do with tuberous Drosera seeds is to soak for 24hours in GA3 solution however.

Use a soil mix of equal parts sphagnum moss peat to sand and do not waterlog the seed pots or trays.

When germinating any tuberous Drosera species it is the difference between the day +/-20C down to the night temperatures of +/-5C, combined with moisture, that finally triggers germination. *This temperature 'swing' is critical.*

Tropical Drosera:

Tropical Drosera require the exact opposite of Tuberous sps, in that there must be very little, if any, temperature difference between day and night temperatures. Germination is stimulated when day temps are in the region of +35C and night temperatures are only 2 - 3C lower.

Tropical Drosera and Tuberous Drosera cannot therefore be germinated side by side since the conditions needed for each are very different!

Sub-Tropical Drosera:

Use Standard Sowing medium and maintain temps of 19 - 25C.

Temperate Drosera.

Cold Stratification is recommended for these mainly American and European sps.

Pygmy Drosera.

These Australian sps should be sown on Standard Planting medium at temps of 15 - 25C. Heat Stratification and the addition of leaf litter ash can give higher germination rates. I have also had excellent results growing Pygmys on 60% moss peat : 40% perlite.

Petiolaris-complex.

These Australian sps require high temps (25 - 35C) and high humidity. Similarly high levels of light intensity for 12 - 14 hours per day are also needed. I use a soil mix of a 60:40 blend of sphagnum moss peat to perlite as recommended by Allen Lowrie. Do not use the tray method for these plants, just ensure that the soil is kept damp and hot!!!

Pinguicula species **Butterwort**

Sow the seeds onto the preferred soil mix of the sps.(see below) and keep in bright light and high humidity. In addition the seeds of those sps that form winter resting buds (hibernacula) will require cold stratification.

Temperate sps: 2 parts sphagnum moss peat: 1 part sand: 1 part perlite.

Mexican and Tropical Sps:Equal parts of Sphagnum moss peat, perlite, sand and vermiculite.

Nepenthes species **Tropical Pitcher Plants**

The viability of Nepenthes seed is highly variable and depends on a number of factors including sps and storage conditions. Germination can be a long process varying from a matter of days right up to 18 months! Many CP seeds are designed to be viable for many years, indeed the seed of Drosophyllum lusitanicum actually has improved viability after 2-3 years storage! Nepenthes seed doesn't however! Always try and get FRESH Nepenthes seed and wherever possible try and establish the date of harvest. Viability of most Nepenthes seed is halved after 6 months post-harvest so use fresh seed and sow soonest!

High humidity and temperatures of 12 - 30C are required.

I sow Nepenthes seed on to live sphagnum moss, however I have seen great success with using pure vermiculite, kept damp, the seeds sown on to the surface and the whole tray covered with clingfilm to maintain humidity.

Genlisea species **The Corkscrew Plants**

Use a soil mix of 3 parts sphagnum moss peat : 1 part sand at temperatures of 25 - 35C.

Genlisea often show low seed viability and the use of GA is recommended.

Byblis and *Roridula* species

Byblis gigantea requires heat stratification and the use of GA can also beneficial. Temps of 15 - 25C are best.

Roridula are sown on the surface of moist medium (sphagnum moss peat and sand, 3:1) then the seeds are lightly covered with more soil medium. The pots are then placed in freezing conditions for 72 hours after which they placed at temperatures 22-25C.

Drosophyllum lusitanicum **The Dewy Pine**

Use a soil mix of equal parts of sphagnum moss peat, sand, perlite and vermiculite. Do not use the tray system but keep the soil damp. I have recently had great success germinating seed using a method perfected by Jan Visee in Germany.

Slice off a small part of the black seed coat to reveal the white endosperm inside and place the seeds on to 2 - 4 layers of damp filter paper. Keep damp at all times

Seeds should germinate within 2 - 4 weeks. As soon as germination has occurred, transplant to their final pots. Seedlings will die if given to much humidity. Keep the soil damp, never wet.

Utricularia **species** **Bladderworts**

Seeds of European and North American sps require cold stratification, and prefer a soil mix of 3 parts sphagnum moss peat to 1 part sand. Provide temperatures in the range 20 - 30C.

Australian sps need heat stratification and a soil mix of 1 part sphagnum moss peat to 1 part sand. High light intensity and day temperatures of up to 35C, with night temps of 18C.

Allen Lowrie also strongly recommends overhead watering 4 times a day.

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