

The Art of Maintaining Root Systems



Some orchids produce massive root systems easily such as *Cymbidium* and *Zygopetalum*, others such as *Paphiopedilum* and *Miltoniopsis* don't. Producing a good root system starts with the germination of the seedlings, or the beginning of the meristem process, in flask. You can produce good plants in flask without any root system simply by omitting the hormones and chemicals that initiate root development. This is normally done where the combination of growing and rooting hormones retard top growth as in the tissue culture of *Eucalyptus* species, then two separate growth media are used, one to promote top growth and one to produce roots. After the plants have produced the required amount of roots, they are then deflasked and grown in a propagation area. This system can also be used for orchids as it is easier to work with them in flask at the early stages of development if they have little or no roots. They are then transferred to a medium containing the hormones needed for root development before being deflasked.

Plants coming out of flask without a good active root system are much harder to establish and losses could be high - hence the deflasking problems many growers suffer. Some growers say the roots produced in flask do not continue to grow once deflasked into a growing medium like bark or sphagnum, however, I do not find this to be true. Roots produced in flask do continue to grow if treated properly. As well, the plant then produces more roots as they harden off. Treating plantlets with hormones/chemicals such as "Best Grow" and "Nu Farm Growth Formula" when deflasking, assist in the retention of existing roots and the quick production of new roots. These chemicals **MUST NOT BE USED AT A STRONGER RATE OR MORE OFTEN THAN RECOMMENDED**. You will only succeed in producing stunted useless plants with huge root systems.

Care should also be taken when using these products on larger flowering plants as the side effects can cause loss of flowers, etc. (see *Australian Orchid Review*, December 1995, page 21). Remember to use your personal protection gear when using chemicals. Treat them all as potential hazards. Selection of the growing medium for the plant's life from seedling to adult and beyond is crucial. Without a good active root system to hold the plant firm in its pot and to gather food and water, your plants will not perform to their optimum.

THE BASICS

PURCHASING PLANTS

Flasks:

Look for a good balance between top growth and roots. Don't look for plants that have reached the top of the flask as these could have run out of nutrients and may be harder to establish. Also, the moisture congregates on the inside of the lid and any leaves against the lid will be growing "under water" and normally die off after deflasking, leaving dead tissue for you to cut off risking infection through an open cut. Select plants about two thirds of the height of the flask.

Small Plants:

Seedlings or mericlones - look for well-established, well-grown plants that are firm in their pots. This normally means a good root system. When you get the plant home, gently slide it out of the pot and check the growing medium and the roots for health and pests. Repot into your preferred potting medium or slide back into the original pot.



Larger Plants:

Look for live root tips and a good open potting medium. As soon as the weather permits (your normal potting time), repot into your preferred potting medium. After potting, a treatment of either of the products mentioned earlier (**ONLY ONCE**) will ensure the minimum of stress to the plant(s).

YOUR OWN COLLECTION



Small Plants:

The same as above - don't be frightened to slide plants out of pots to check the medium and roots. If you can't get the plant back into the pot, simply pot into a larger pot it evidently needs. This can be done nearly all year. Regular potting of small plants, even every six months, is beneficial. The plants seem to respond and enjoy the fresh growing medium.

Larger Plants:

Repot every two years. Every twelve months remove the top inch of medium and sprinkle a little Blood and Bone, then top off with new potting medium. Select your growing medium with care (see growing medium next paragraph) and if you suspect a problem is occurring, take the plant out of its pot and check. Some orchids such as Paphiopedilum, Miltoniopsis, Disa and all terrestrials should be potted every year.

GROWING MEDIUM

This is where your own cultural practices dictate the type and size of the product you use to pot your orchid into. The amount and quality of water, the type of house, be it shade cloth, fibreglass roof with shade cloth side or totally enclosed glass/fibreglass, the amount of air movement and fertilizer are all factors that place demands on your potting medium. Other factors such as very cold frosts also dictate the type of potting medium. Don't put your plants into a mix that will hold a lot of moisture if you get severe frosts. That moisture will freeze killing the plants' root system.



After some 30 years of growing orchids and trialling many potting media and additives, I still return to good composted bark. There is nothing better for a mixed genera collection. In specialist situations and with good quality water, you can use other mediums successfully.

Selection of the Potting Medium:

This, as stated previously, must be in conjunction with your own personal cultural practices. Choose a grade of bark that will meet the following criteria. You should do a set of trials using the same plants in the same type and size of pots in different grades of bark.

- (1) The bark will last for two years.
- (2) The roots are attracted into the bark.
- (3) The bark drains quickly.
- (4) The bark retains a coating of moisture.
- (5) There is ample air space between the pieces.
- (6) The pH of the bark is compatible with the type of orchid to be grown in it (fertilizer uptake is restricted if the pH is not correct).
- (7) The bark comes in the correct sizes for your usage - Fine, Medium, Coarse and Extra Coarse.
- (8) The bark is rough so it does not pack down over a period of time.

Preparation of The Bark:

If the bark is already composted, as in Debco, a little Blood and Bone mixed into the moist bark and left for 3 to 4 days will suffice or you can use it straight from the bag. If the bark is fresh, it should be treated with a combination for fertilizers, moistened, mixed several times over a period of several weeks before use. It should have a good earthy fragrance, not a pine fragrance. **POTTING:** The bark should be moist, NOT WET, when you pot with it. After potting, a soaking with either "Best Grow" or "Nu Farm Growth Formula" will be beneficial in reducing the stress on the plant and ensuring the roots get away quickly to hold the plant firmly and begin to feed the plant. Selection of the pot is important. **DO NOT OVERPOT**, select a size that will give your plant two years growth. Remember, clay pots dry out faster than plastic pots, so take this into consideration when selecting a potting mix. You may have to use a finer mix so the plants don't dry out too quickly. If you are a heavy waterer, clay pots might be the right option.

Retention of a Good Active Root System:

If you have followed a similar program to the one I have outlined, you shouldn't have any problems. If not, then why not try changing a few of your plants to see if you can improve them and make sure they are "doing their best" for you. If they grow and perform better, change the rest over. Remember, unless they have a good root system under them, they will not perform to their optimum.

HELPFUL HINTS:

- (1) Select a medium that will last two years.
- (2) Select the right grade to suit your culture and the plant.
- (3) Larger pieces can be used in the base of the pot to add to the drainage.
- (4) The only additive other than fertilizer, I suggest is styrene foam.
- (5) The bark must drain freely.
- (6) Ensure the bark is properly treated and not too fresh so the roots will be attracted to it.
- (7) An application of either of the two products mentioned is beneficial.
- (8) Use the correct type of fertilizers, totally chelated forms are recommended.
- (9) Remember, organic fertilizers are beneficial from time to time but constant use can break bark down quickly.
- (10) Flood the pots regularly with water to remove stale air from between the bark and replace with fresh air containing oxygen.
- (11) Check your root systems regularly at least twice per year.



Good Growing.

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These notes have been used at our Cultural and New Grower's Meetings. They are from various sources and we thank the authors. All articles are supplied in good faith and the Bribie Island Orchid Society and its members will not be held responsible for any loss or damage.