BEGINNER'S SERIES

Orchid Culture — Part 10 — Repotting

Text and photos by STEPHEN R. BATCHELOR

Most orchid growers face the chore of repotting (or reslabbing) their orchids reluctantly. However unappealing this task, it is a very necessary one. As previously discussed in this series, organic media unfortunately decompose into humus, a material, by itself, unfit for orchid roots. In a decomposed medium roots rarely have adequate oxygen to survive and function (see illustration). Therefore repotting must occur before significant media decomposition takes place, in order to avoid major root loss. Once again, healthy roots are a must for healthy orchids!

Even as a slab, tree fern eventually decomposes. If remounting had been done before the decayof this slab, the nearly total loss of the root system of this epidendrum would have been avoided.

Fast-growing sympodial orchids (those which grow horizontally by rhizomes) may bring on the need for repotting before media decomposition (see illustration, page 1318 of the November 1981 BULLETIN). A plant which has "crawled out of its pot" and is rambling along as it pleases in mid-air will require repotting and/or dividing before things get out of hand!

WHEN TO REPOT

Repotting is an unavoidable disruption to the potted orchid. This disruption can be lessened with expert technique, yet inevitably some injury is going to result in the process of replacing old medium with new. Nevertheless, minor root damage in repotting is of little consequence when compared to the alternative of major root decay if a change of medium is delayed. With new root growth orchids overcome any damage which may occur with repotting. For this reason it is very important to repot at a time when the orchid is just beginning, or is capable of beginning, new root growth.

By way of explanation, consider deciduous calanthes. Like a number of orchids, they have a distinct period of inactivity. This rest period typically follows the

maturation of new growth, the loss of leaves, and, finally, flowering. Annual repotting is recommended, the procedure being to remove and divide the plants after flowering, and to maintain the pseudobulbs, bare-root, until new growths begin. Only then is repotting to occur (Hawkes, 1965). Repotting after new growth has initiated comes just prior to the period of greatest root growth (see illustration, page 949 of the August 1981 BULLETIN). Placed into a new medium at this stage, a calanthe can fairly rapidly grow into the mix, establishing itself for the water and nutrient uptake needed to produce the growth and flowering to follow.

The cluster of root tips at the base of the c*Cattleya* hybrid indicates a good time to repot. Photo: Greg Allikas

Deciding whether an orchid could produce new roots at the time of repotting is just as important for orchids without well-defined rest periods. Most complex Cattleya hybrids are capable of forming new roots nearly anytime. Even so, repotting a plant with an actively expanding pseudobulb just beginning or about to produce its own cluster of roots is ideal timing (see illustration). Such a practice often means quick establishment in the new medium. To wait until root development on the new growth is nearly completed is less than ideal, not only because another such flush of new, penetrating root growth is less likely, but also because those newer roots will be exposed, like the rest, to mechanical damage in repotting.

Proper timing of repotting also considers the flowering period of the orchid involved. Since a change of medium is to some degree a shock to a plant, repotting at a time when an orchid is in bud or flower is risky. If repotting is done during the period of bud development, bud drop could result. At the very least, some lessening in the ultimate size and longevity of the flower(s) is apt to occur.

Sometimes timing repotting to coincide with a period of active root development is not possible, due to a dangerously decomposed medium. In this case, it is far better to repot before all roots are lost, and to encourage new root formation into fresh medium where there is a good chance of survival. Whether it be a result of higher oxygen levels, or a lesser chance of disease attack, orchids with few viable roots (and those with a good number) are generally more inclined to form new roots in a drier medium than one which is wet. After restricting water to bring this about, the trick then is to avoid severe desiccation during this tenuous, root-deprived period. This can be done by providing conditions which discourage high transpiration (water loss) rates (such as high humidity, lower light intensity, etc.) until new roots are formed and on their way towards establishment. Very validly,

many growers will not pot up a rootless orchid until new roots are initiated, keeping the plant in a bag, under a bench, or on a flat of moist medium to achieve these low-transpiration conditions.

REPOTTING PROCEDURE

It is fairly obvious when a sympodial orchid is about to outgrow its container and will soon need repotting (see FIGURE 1 of the repotting sequence illustrations). For orchids which grow vertically (monopodial types), this is not likely to be the reason for repotting. Determining whether repotting is necessary because of media decomposition requires a bit more investigating. Naturally, as media break down and become less porous, they take up less space in the pot. A lowering of the level of a medium is a good indication of decomposition (see illustration). An examination of any roots along the surface will reveal whether they have declined, as is the case in the accompanying illustration. As previously mentioned in this series, jiggling the plant in its pot will also indicate root condition. Any significant shifting of an established plant suggests substantial root loss. Examining the resistance of the medium with a probing rod or finger is another method of assessing decomposition. If there is little resistance, one can assume major decomposition of the mix has taken place.

Though this *Phalaenopsis* hybrid has not outgrown its pot, it is nevertheless inneed of repotting because of media decay. Decomposition is indicated by the shrinking of the media and the decline of the surface roots.

Once it is decided that repotting is necessary, for whatever reasons, the logical first step is to remove the plant from its pot. Many knowledgeable growers find this easier to accomplish while the medium is moist. In addition, a moist mix more easily separates from the roots. The roots themselves are perhaps more pliable and less likely to break, when moist. If, even with a moistened mix, the plant resists removal, a knife inserted and run along the inside surface of the pot may help to separate the rooted medium from the pot itself.

After the plant has been removed, the condition of both the roots and the medium can be fully seen for the first time. Now there can be little doubt as to whether repotting is called for. If the mix is decomposed, it will be more than apparent (see illustration, page 1212 of the October 1981 BULLETIN), and immediate repotting in fresh medium is imperative. But if the plant — roots, medium and all — slips out of its pot intact, and the roots and medium appear light in color and undecomposed

(see FIGURE 2), reconsider. Can the present container accommodate yet another year's growth? If it can, delay repotting. Reinsert the plant and allow it to continue in its present container relatively undisturbed. On the other hand, if the pot is presently too small, do not simply insert the plant, present medium included, into a larger pot, adding additional fresh (or, God forbid, used) medium to fill in the additional space. What you have then is two effectively different media in one pot, and, in any event, it will be the original, older medium which will ultimately dictate repotting. Little time will then be gained. It is best in this case to start entirely afresh in new medium.

Fig. 1 -This Cattleya hybrid is about to outgrow its pot The two new growths are reaching the stage when roots will be initaed. Now is a good time to repot

Removal of the old medium should be done carefully, in order to preserve as many viable roots as possible. Some living roots will inevitably be broken, however. After all the mix has been removed, damaged and dead roots should be removed as well, using sterilized scissors or clippers. This helps reduce the likelihood of infection. (See illustrations, page 948 of the August 1981 BULLETIN for a visual distinction between living and dead orchid roots.) This "depotted" stage is also an excellent time to generally groom the plant, removing dried pseudobulb and rhizome

Fig. 2 –With moist roots the plant is easily removed from the pot. The root system is alive and well and the media is in good condition.

sheaths, dead or diseased leaves and pseudobulbs, etc. While all this is being done, some thought should be given to the possibility of dividing the plant in hand (see FIGURE 3) Is a specimen plant desired? If so, division is obviously contrary to the

goal in mind. Container culture of large specimen plants generally requires large pots, a tricky venture even for the most experienced of growers. Slow drying of the center core of media in such pots make specimen plants vulnerable to rampant rots. My recommendation to the beginner is to keep to 8-inch or smaller pot sizes for this reason. This of course will necessitate dividing plants which outgrow the larger pots. Propagation by division will be discussed in the following article of this series.

Whether one plant or two, or more, result, a proper, sterilized pot must be found to accommodate each bare-root subject. At this stage, control the urge to resort to "the bigger the better" philosophy! (See table, "Guidelines in Selecting Growing Media", page 1323 of the November 1981 BULLETIN.) Larger-than-necessary containers, while seemingly providing ample room for new growth and thus a longer time before the next repotting, are counterproductive. Media in such containers last a shorter time than those in smaller pots because they dry more slowly. Drying more slowly, decomposing more quickly, such media are less aerated as well. Most orchid growers would agree that, as a rule, the great majority of orchid roots will stay away from the relatively airless and wet interiors of a mix, preferring to grow nearer the interior surface of the pot. This tendency is more pronounced the larger the pot and the greater the amount of mix.

Fig. 3—The original medium is now removed with as much care as possible. Even so, note the root damage that has occurred in the process. Division can now be considered. A logical dividing point is show by the line.

All these tendencies work against, not for, a plant placed in too large a pot. The old rule-of-thumb applies: in repotting, the new pot should be large enough to accommodate no more (and no less) than two years of additional growth. Because few conventional media last any longer than two years at a maximum, there is no point in potting any larger — particularly with these other negative considerations in mind.

To further enhance the all-important drainage and aeration of a mix, whatever the size of the container, inert material, such as clay shards or gravel, is often layered in the bottom few inches of the pot before the plant and medium are inserted.

The plant to be repotted should now be properly positioned in a suitable pot. For horizontally-growing sympodial orchids, the greatest distance between the plant and pot edge should be on the side where new growth is most likely to occur. This is where the space will be needed. With cattleyas, for example, this means

placing the oldest pseudobulbs, the backbulbs, flush against the edge of the pot, in turn providing the largest area immediately in front of the most recent growth. Once the plant is in position, its rhizome should be level, or just below, the top of the pot (see FIGURE 4). For vertically-growing monopodial orchids, such as phalaenopsis or ascocendas, placing the plant in the middle of the pot is best. This allows root growth to radiate evenly in all directions from the plant itself, and aids in plant and pot stability.

Fig. 4 - After division into two plants and removal of diseased leaves and damaged roots,each resulting plant is inserted into an appropriate, sterilzed pot conatining a layer of gravel in the bottom. The oldest pseudobulbs are kept close to the pot edge to allow space where needed in front of the newest growth.

Now the mix, previously prepared and moistened, may be added. While holding the plant in position with one hand, handfuls of mix can be applied with the other. When enough has been added to hold the plant more or less in place, both hands may be used to properly press the mix around the roots. An occasional rapping of the pot and plant on the potting surface will help to further settle the mix. All this is done to ensure that no gaps in the medium will remain, and that the plant is, in the end, secure. Additional mix should then be applied until the medium rises to the level of the rhizome, in the case of sympodial orchids, or well covers the area of greatest root production at the base of most monopodial orchids.

Once all this has been completed, the plant should still be in its initial position, and firmly in place. A "shaky" orchid cannot establish itself properly! Staking may be necessary for the tall (monopodial) or top-heavy (sympodial) orchids to provide additional support. Fortunately, modern breeding, particularly with the Cattleya types, has brought down the height of most hybrids, so that staking for plants in bark mixes, a requisite for the giant hybrids of the past, is no longer usually required. Last of all, but very important, the name tag should be transferred to the new pot!

Although some shriveling may occur immediately after repotting, repotting, if done properly, should soon result in an outburst of new roots (FIGURE 5). Assuming that the plant is firmly potted, these new roots should readily penetrate and establish in the fresh medium, enhancing the water and nutrient absorption so crucial for successful growth and flowering.

A plant securely in place is critical in the mounting of orchids as well. Monofila-ment fishing line, or heavier wire, is frequently used for attaching orchids to slabs. It should be wrapped as many times as necessary around the slab and plant,

Fig. 6—A month after repotting, vigorous, new roots have formed and begin to penetrate the mix. Note that some wrinkling of mature pseudobulbs Once new roots establish, these signs of desiccation will disappear.

so that the base of the orchid does not move when the plant is touched or shaken. In this way, new roots can form and establish on the mount without disturbance (see illustrations). Occasionally, growers will "sandwich" a mat of absorbent material (sphagnum moss, sheet moss, or osmunda) between the plant and the slab itself. In mounting certain orchids, this practice seems to produce better results.

Recently mounted on a tree fern slab with monofilament fishing line, This plant of *Den.loddigesii* has established itself and begun new growth

SUMMARY

If done before significant media decomposition, and at a time when new roots are or can be produced, repotting can be of little disruption, and much benefit, to an orchid. Next month, a discussion of various propagation techniques will give the beginner several options for increasing his collection, without additional cost. — 84 Sherman Street, Cambridge, Massachusetts 02140.

BIBLIOGRAPHY

Collins, Ralph and Richard Peterson. 1975. **Potting Cattleyas — Part 1 and 2**.

Amer. Orchid Soc. Bull. **44** (5 and 6): 406-411, 480-484.
Collins, Ralph and Richard Peterson. 1975. **Potting Phalaenopsis**. *Amer. Orchid Soc. Bull.* **44** (7): 624- 626.
Collins, Ralph and Richard Peterson. 1975. **Potting Paphiopedilums**. *Amer. Orchid Soc.* Bull. 44 (8): 692-699.
Fitch, Charles Marden. 1977. **The New Grower — Cattleya Culture** — 2. *Amer. Orchid Soc. Bull.* 46 (6): 504-507.
Hawkes, Alex D. 1965. *Encyclopaedia of Cultivated Orchids*. Faber and Faber Limited, London.
Northen, Rebecca Tyson. 1973. **Orchids for the Beginner — 4 — Potting**. *Amer. Orchid Soc. Bull.* 42 (4): 329-337.

A Tolumnia species is well established on a cork slab.
Note the abundant root growth from the quick-drying, airy conditions.