

## Catasetum and Cycnoches — Part 6 — Culture Influenced by Growth Cycle

STEPHEN R. BATCHELOR

THE ANNUAL GROWTH CYCLE of catasetums and cycnoches has the greatest effect on the watering and fertilizing practices of those who grow them. The most successful growers adjust their watering and fertilizing to the fluctuating growth rate of these orchids. Water and nutrient requirements of catasetums and cycnoches, as with all orchids, are determined by a number of factors in their environment, aside from their rate of growth. Nevertheless, a rapidly growing plant needs more water and nutrients for developing tissue than one which has completed growth and flowering and is losing its leaves. In addition, water loss, transpiration, increases as the leaf area increases. Transpiration in turn greatly affects the water requirements of a plant. A *Catasetum* or *Cycnoches* in full leaf, then, is naturally going to need far more water than one which is leafless.

### WATERING

Since catasetums and cycnoches generally undergo their most rapid growth in the early and mid-summer (see last month's article), expert growers of these orchids provide water and fertilizer in the greatest quantities during this time. A half-dozen talented growers of catasetums and cycnoches from around the nation were polled for this and the following article. Of this group, several growers in southern Florida water their plants of these genera every day during the growing season, roughly from spring through late summer (Fuchs, 1983; Lodyga, 1983). The growers in cooler, more northern locations water their catasetums and cycnoches nearly as often (Soule, 1983), or find that watering once or twice a week during the growing season is sufficient to keep the plants continually moist (Riopelle, 1983; Turner, 1983).

But how much to water when the plants are leafless and at rest? Certainly less than when they are undergoing rapid growth! It is important to note that those who grow catasetums and cycnoches well do not withhold water entirely during the plants' rest period. Of the growers polled for this article, all reduce their watering frequency after flowering and leaf loss in the winter, not increasing it until new growth appears and begins rapid expansion in the spring. One such grower waters as infrequently as once per month during this period of rest (Krull and Smith, 1983), another states "We water when dry" (Lodyga, 1983), while a third emphasizes "Never allow [the media] to completely dry out" (Riopelle, 1983), and yet a fourth waters every five to eight days, noting that during a plant's rest period, "Long dry spells where bulbs shrivel damage the plant's ability to come into vigorous growth on the next cycle" (Soule, 1983).

Though a convenient way to indicate water requirements, too much talk about intervals of time between waterings can be misleading. The growers cited above were responding to the question, "How often do you water these plants on the average?" Undoubtedly the amount of time between their waterings vary far more than is indicated by these two extremes in the growth cycle. The best growers of orchids, catasetums and cycnoches included, are those who do not try to conform the plants

to rigid schedules, but rather alter their cultural practices to the needs of their plants. In order to do this, they utilize a keen and observant eye.

As discussed in last month's article, though catasetums and cynoches often lack leaves during their rest period, they do have both pseudobulbs and roots which require some moisture to survive. Roots which dry out completely do not survive, and for this reason some moisture should be present around the roots at all times. Just how much watering is needed to achieve this end is determined by the number of pseudobulbs and roots, as well as other factors in their growing environment, including light, temperature, humidity and air movement, the potting medium and the type of container. This set of conditions varies for every grower, nearly every day, and for this reason the best means of deciding when and how often to water is to "ask [observe] the plant itself." The shrivelling (or cracking) of pseudobulbs mentioned above is one indication that the plant has been too dry for too long. As this can lead to damage of these precious energy reservoirs, it should be avoided. One of the best ways for the beginner to assess, at any time, the moisture level around the all-important roots, which absorb the water needed, is to make an indirect observation by lifting the container and comparing this weight to the weight of the plant when just watered. With experience and practice, this will give the beginner a good sense of how much water is present in the medium surrounding the roots. Of course, the roots and medium can be directly observed by unpotting the plant. By the time the plants enter their rest period, the roots produced by the latest growth should be well established, allowing for the removal of the roots and medium intact (see the illustrations for the previous article). However, if the plant happens to be in an open-mesh basket, which allows the vigorous roots of these orchids to grow with abandon, inside and out of the container, this means of observing the entire root system is not feasible. During their rest period, they do have both pseudobulbs and roots which require some moisture to survive. Roots which dry out completely do not survive, and for this reason some moisture should be present around the roots at all times. Just how much watering is needed to achieve this end is determined by the number of pseudobulbs and roots, as well as other factors in their growing environment, including light, temperature, humidity and air movement, the potting medium and the type of container. This set of conditions varies for every grower, nearly every day, and for this reason the best means of deciding when and how often to water is to "ask [observe] the plant itself." The shrivelling (or cracking) of pseudobulbs mentioned above is one indication that the plant has been too dry for too long. As this can lead to damage of these precious energy reservoirs, it should be avoided. One of the best ways for the beginner to assess, at any time, the moisture level around the all-important roots, which absorb the water needed, is to make an indirect observation by lifting the container and comparing this weight to the weight of the plant when just watered. With experience and practice, this will give the beginner a good sense of how much water is present in the medium surrounding the roots. Of course, the roots and medium can be directly observed by unpotting the plant. By the time the plants enter their rest period, the roots produced by the latest growth should be well established, allowing for the removal of the roots and medium intact (see the illustrations for the previous article). However, if the plant happens to be in an open-mesh basket, which allows the vigorous roots of these orchids to grow with abandon, inside and out of the container, this means of observing the entire root system is not feasible.

## FERTILIZING

Nutrient requirements, like water requirements, are to a large extent determined by a plant's environment. Just the same, the plant itself, and its rate of growth, is the best indication of how often and how much fertilizer should be applied. *Catasetums* and *cynoches* are known to be "heavy feeders" because of their tremendously vigorous growth. But they are not always growing; this astonishing growth takes place all in the course of four months on the average. The remainder of the year the plants are either flowering, at rest, or just beginning new growth (see previous article). Large quantities of fertilizer are not necessary, nor used, during times of little growth; yet inadequate nutrients during the period of rapid expansion of new growth can limit significantly the size and vigor of the resulting pseudobulb and, as a consequence, the number of flowers ultimately produced by the plant.

The most successful growers of *catasetums* and *cynoches* fertilize very heavily while their plants are growing. In this way, the full potential of each growth is achieved, resulting in huge pseudobulbs packed with the energy needed for extravagant flowering. Large amounts of nutrients can be applied to the plants in either of two ways. Some of the growers polled apply moderate amounts of conventional, water-soluble fertilizers ( $\frac{1}{4}$  to  $\frac{1}{2}$  teaspoon per gallon of water) at every watering (Riopelle, 1983; Krull and Smith, 1983) — which, as discussed, is quite often! Another uses high concentrations of water-soluble fertilizer (1 tablespoon per gallon of water) on a weekly basis during active growth (Fuchs, 1983). Still others apply a combination of both quick- and slow-release fertilizers to ensure a large and constant supply of nutrients during this critical period of growth. One such grower states, "We top-dress with Osmocote 14-14-14 and fertilize weekly with Peters 20-20-20 at 1 tablespoon/gallon" while the plants are growing (Lodyga, 1983). Another supplies his *catasetums* and *cynoches* with only 1 teaspoon/gallon of 20-20-20 water-soluble fertilizer every two weeks, but the potting medium he uses for his plants is composed of 20% well-rotted manure (Soule, 1983)!

Of all the growers polled, only one fertilizes at all during the winter months when the plants are basically inactive, and then for the most part with a low-nitrogen fertilizer given preferably on bright, sunny days (Riopelle, 1983). The others cease fertilizing after growth and flowering, resuming this practice only after new growth has begun. One grower comments that he waits until the new roots from the recently initiated growth have penetrated well into the medium before beginning to fertilize (Soule, 1983).



*All Photography: Stephen Batchelor*

**FIGURE 1** — In the process of repotting, the dead older roots of this *Catasetum* hybrid reveal that the plant was overwatered during its winter rest. Their complete removal is necessary before repotting.

## REPOTTING, POTTING MEDIA, POTS AND PROPAGATION

The annual growth cycle of *catasetums* and *cynoches* strongly influences repotting practices as well. In the past, growers often unpotted their *catasetums* and *cynoches* once they lost their leaves in the winter, and kept them bare-root under the bench until growth resumed in the spring, often cutting back, or losing, most of the old roots. The growers polled for this article do not continue this practice. One grower, when asked whether he employed such a method for these plants, responded emphatically, "Absolutely not! Some old roots will stay alive and functional if not totally dried out. These give the new growth a substantial head-start" (Soule, 1983). Instead, this grower and the others polled are careful not to disturb the plants until new growth, and growing root tips, appear (FIGURE 1). This makes good sense. A plant which has resumed active shoot and root growth is a plant which will reestablish rapidly with a minimum of relapse when repotted. Maintaining *catasetums* and *cynoches* in their pots or containers throughout their rest periods minimizes the risk of overexposure and damage to the root system. On the other hand, waiting until after the new roots have grown to some length often leads to unnecessary root damage in the repotting process. Ideally, a *catasetum* or *cynoches* should be repotted just as the "nubs" appear at the base of the new growth, when it is usually around an inch (2.5 cm) long (Soule, 1983). In this way, damage to tender root tips (at least on the new growth) is avoided entirely.

Right, FIGURE 2 — Repotted at the point when roots from its newest growth are just beginning to grow, this plant should reestablish quickly despite the total loss of its older roots. A sturdy stake to which the largest pseudobulb is tied should help steady the plant until that time.



Below, FIGURE 3 — A *Cynoches* pseudobulb beginning its third year shows signs of decline, and has lost its roots. Severed several months earlier from the younger front-bulbs of a plant and kept bare-root, it has initiated a new, though weak growth and is ready to be potted up.



The repotting process itself for *Catasetums* and *Cynoches* does not depart radically from common, conventional practice. One grower polled has found that the new roots emanating from the young growths occasionally have trouble entering the fresh medium. For this reason he initially adds the mix to a level 1-2 inches (2.5-5.0 cm) below the root tips. When the new growth reaches a height of 3 inches (8 cm), he then adds the rest of the mix to a final level even with the base of the new growth (Soulc, 1983). Because healthy, mature *Catasetum* and *Cynoches* pseudobulbs are typically quite tall, most plants of these genera require some staking after repotting until the newest roots have had a chance to establish themselves within the medium (FIGURE 2).

In the repotting process, the grower is apt to discover how successfully he or she watered the plants through their rest period. This grower, who is still learning, discovered to his dismay that during its rest period he overwatered the *Catasetum* pictured in FIGURE 1. Consequently, when he went to remove the sphagnum moss potting medium, all the older roots were rotted, lifeless. Fortunately, *Catasetums* and *Cynoches* are forgiving, due to their vigorous nature, and the abundant roots flowing from the new growth, with more careful attention to watering and other needs during the growing season, did fairly well replace those lost roots with another root system capable of sustaining the plant. Even so, the plant did suffer a set-back: the pseudobulb produced after this error was considerably smaller than those produced before — though it did flower satisfactorily.

Learn from the mistakes of others! Watering practices, both during growth and rest, are also very dependent on the type of potting medium and container. Available at many garden centers, sphagnum moss is used by some growers of *Catasetums* and *Cynoches*, particularly those in warmer, southern climates (Fuchs, 1983; Lodyga, 1983), because of its high water-holding capacity. When used in combination with porous clay pots, a moist but aerated root environment is achieved. One grower polled does note, however, that he reduces the frequency of watering for plants in this medium to every third day in the summer (Fuchs, 1983). Growers in cooler climates may find, as I did, that even in clay pots, sphagnum takes too long to dry during the cool, cloudy weather typical of winter. This, as is evident in FIGURE 1, can spell doom for *Catasetum* and *Cynoches* roots.



Above, FIGURE 4 — By late summer, the new growth has developed and established, while the *Cynoches* backbulb which produced it has exhausted its reserves and died.

Right, FIGURE 5 — This single vigorous *Cynoches* pseudobulb, only a year old, has produced a new growth nearly as strong, which will bloom nicely once mature.



As one grower wisely points out, any growing medium can be used for *Catasetums* and *Cycnoches*, "including baskets or slabs, but the container dictates the medium. A mix similar to that used for *Miltonias* is good for plastic pots, with a 'heavier' mix to hold water for clay". That grower's mix is composed of 3 parts fine-grade bark, 3 parts perlite, 1 part peat, 1 part redwood chips and 1 part composted manure (Soule, 1983). Jim and Marie Riopelle, well known for their excellent culture of *Miltonias*, among other genera, use the same potting mix for *Catasetums* and *Cycnoches*, in plastic pots, that they use for their *Miltonias*, *Paphiopedilums*, *Lycastes*, *Masdevallias* and *Odontoglossums* (Riopelle, 1983). This mix is explained in detail in their wonderful article on *Alillonia* culture appearing in last year's June *Bulletin* (Riopelle, 1982, page 583). Open-mesh or slatted baskets are often used, especially for *Catasetums*. One grower lines these airy containers with *Osmunda*, known for its ability to hold water (Fuchs, 1983). Another southern grower finds a 50/50 mix of fine-grade fir bark and charcoal works well for his *Catasetums* and *Cycnoches* (Krull and Smith, 1983).

For those beginning growers inclined to overwater, like myself, a conventional mix of medium-grade fir bark and coarse perlite in a 5:1 ratio can be used (FIGURE 2). This mix has its limitations, though. It is not a "rich" mix; being very woody, it requires a high-nitrogen fertilizer (e.g., 30-10-10) in abundance to feed both the hungry *Catasetum* or *Cycnoches* roots and the countless microorganisms present which decompose the wood. In a clay pot, as pictured, it dries very quickly, and may require several waterings during hot, sunny days in order to stay moist. As recommended above, this kind of mix is better suited for a plastic pot. With this more appropriate combination of open medium and plastic pot, the beginning grower should be able to maintain adequate moisture during the summer months, as well as reduce the risk of overwatering during the touchy winter months of rest. Apparently the type of container also has an effect on the frequency of repotting. One grower states, "Plants grown on driftwood or in baskets do not require transplanting. I repot *Catasetums* and *Cycnoches* which are grown in pots every two years" (Fuchs, 1983). At the same time another responds that he repots yearly for plants in pots, every three years for those in baskets (Soule, 1983). The majority of those polled, however, do grow in pots and do repot annually (Krull and Smith, 1983; Lodyga, 1983; Riopelle, 1983). It seems that many successful growers of *Catasetums* and *Cycnoches* have found that annual repotting ensures the fresh, open yet moisture-retentive environment necessary for vigorous root growth and healthy plants.

Propagation by division, and repotting often go hand-in-hand in horticulture, and *Catasetums* and *Cycnoches* are no exception in this regard. Division is the most commonly used means of increasing the numbers of these genera. Unlike other orchids with less substantial pseudobulbs, such as *Cattleyas*, single-bulb divisions can be made of *Catasetums* and *Cycnoches* which will flower on the next growth — if the pseudobulb is mature and healthy to begin with. As mentioned in previous articles, the pseudobulbs of *Cycnoches* tend to be short-lived. By the beginning of its third year, a *Cycnoches* pseudobulb usually shows signs of depletion (FIGURE 3) and commonly yellows and dies by the end of the growing season. If this backbulb is severed from the younger front-bulbs during repotting at the beginning of the growing season, and kept unpotted in a warm location with bright but indirect light, it will attempt a new growth from one of the eyes at its base (FIGURE 3). Only after that new growth initiates roots should it then be repotted and grown on, as is the case with all *Catasetums* and *Cycnoches*. The new growth resulting from an

old or weakened pseudobulb is very likely to be significantly weaker (FIGURE 4) ultimately producing a far smaller pseudobulb, than one produced by a healthy, single *Cycnoches* pseudobulb only a year old (FIGURE 5).

Catasetums tend to have smaller pseudobulbs than cynoches, and most of the growers polled prefer more than one pseudobulb per division. One grower suggests placing backbulbs in empty pots, giving them a "splash" once a week, waiting until new growth starts and initiates roots before potting up (Riopelle, 1983). This method also has the benefit of keeping the pseudobulbs — and their new growths — fairly upright, avoiding the bend that new growths are apt to take when developing from backbulbs placed horizontally.

On a far larger scale, catasetums and cynoches can be tissue-cultured, and a number of superior mericlones are available. Additionally, some *Catasetum* species in particular have the ability to form plantlets from their roots, of all places. If seeing is believing, Rentoul pictures a plant of *Catasetum fimbriatum* doing just that (Rentoul, 1983, page 109).

Next month, the concluding article for this series on *Catasetum* and *Cynoches* will consider other aspects of their culture, as well as some of the problems both beginning and experienced growers encounter in growing these genera. — 84 Sherman Street, Cambridge, Massachusetts 02140.

## REFERENCES

- Fuchs, Robert, 1983. R. F. Orchids, Homestead, Florida, *personal communication*.
- Lodyga, Louis T., 1983. Jones & Scully, Inc., Miami, Florida. *personal communication*.
- Krull, Jim and Frank Smith, 1983. Krull-Smith Orchids, Apopka, Florida, *personal communication*.
- Rentoul, J. N., 1983. *Growing Orchids, Book Three, Vandas, dendrobiums and others*. Timber Press. Portland, Oregon.
- Riopelle, Jim and Marie Riopelle. 1982. **Miltonia Gordon Hoyt 'Dolores'**, FCC-CCM/AOS. Amer. Orchid. Soc. Bull. **51(6)**: 579-587.
- Riopelle, Jim and Marie Riopelle, 1983. Portland, Oregon, *personal communication*.
- Soule, Lee C., 1983. Manchester, Connecticut, *personal communication*.
- Turner, Henry 1., 1983. Jamaica, New York. *personal communication*.