

# Growing Cattleyas from Seed to Flower in 2½ Years\*

By HERBERT HAGER

IT IS INDEED AN HONOR to be a speaker at the First Annual Western Orchid Congress. I am sure all of you have seen the program and know that my subject is "Growing Cattleyas from Seed to Flower in 2½ Years."

As the normal time to flower Cattleyas, as stated in most orchid books, is 4 to 7 years, I feel sure there are some among you who have a little doubt in your minds. In fact, a few of my friends had so much doubt they came to Vallemar Gardens to check up ahead of time! I was very happy to see them and have them satisfy themselves as to the truth of my statements.

So as not to mislead you, I have found through my own experience that about 10% of a batch of seedlings will flower in 2½ years, 80% will flower in 3 years, and the balance, usually through a weakness in the plant or improper culture, will flower 6 to 12 months later. In my estimation, the value of shortening the time of flowering the first 10% lies in the fact that it gives a good indication of the quality of the entire cross and you can decide at that time whether to keep or dump it. Plants do not require much space or labor until they are shifted from 3" pots and it pays to know before then how good the cross is.

There are a lot of things that we do not know about growing Cattleyas; they thought so 50 years ago; we still think so. But as we go along from year to year we are gradually increasing our knowledge of what the plant needs to make it grow well, to flower when we want it to, and to produce the quality and type of flower we want.

A few years ago I had the pleasure of spending a couple of weeks in Hawaii. This trip was very valuable to me in that it gave me an opportunity to gain knowledge I would never have gained otherwise. Some of my very fine Hawaiian orchid-growing friends showed me Cattleya seedlings growing outdoors under lath and flowering in 3½ years without any trouble at all. There they were taking full sunlight, the weather as it came — wind, rain, or shine — and yet in 3½ years from seed they were in bloom. I wondered, if they could shorten the time of flowering under those conditions, why in the world can't we under conditions which we can control? To me this was a challenge. I began to analyze and compare growing conditions there and here and I found a number of things: first, they have a long day; second, the temperature at night usually is about 70°F.; third, the light intensity is very high over a long period of time; and fourth, they feed heavily.

As I see it, the plant needs heat, it needs light, it needs food, and for continuous growing it needs long hours of daylight to store up energy so that the plant can grow during darkness. It needs water to develop the growth and humidity to reduce water loss by transpiration so there is an adequate supply for growth. These six factors will give rapid growth if they are applied in balance. The method I have used follows.

**Flasks:** nutrient formula, Knudson's C; temperature, 68–70°F. nights, 80–85°F. days; relative humidity, 50%–70%; light intensity, started at 200 foot-candles, increased gradually after germination to 400 foot-candles; day length, artificial light added to daylight to a total of 16 hours, winter or summer, regardless of season; time in flasks, 4 to 6 months (1 growth completed).

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Some of you might ask, "Why not go to 20 hours or 24 hours continuous light?" Well, the plant needs some darkness to complete the process of food manufacture and to produce growth. As far as I can determine, as yet, 16 hours does what I want it to do. There is a lot still to be learned in this direction.



LEFT, plant 2½ years from seed. CENTER, 1 year from seed. RIGHT, plant 20 months from seed having been repotted at 10 months to 3" pot.

**Flats:** planting medium, EZR Grow mixed with yellow osmundine; temperature 68–70°F. nights, 80–90°F. days; relative humidity, 50%–70%; light intensity, started at 400 foot-candles, increased to a maximum of 600 foot-candles; day length, as above, 16 hours total; time in flats, 6 months (2 growths completed), elapsed time from seed one year.

Plants are removed from the flask and transplanted to flats, which I prefer to pots. Since we sell no plants, it is not necessary to keep them in small containers. Pots, of course, may be used. At this stage the plants are fed. The feeding program is very gradual to begin with. I am not exactly an advocate of light feeding — I feed heavily. I know you are going to ask, "What are you using?" Well, I'll tell you. I am using at this time a combination of W.P. solution and Hoagland's solution, the exact amounts, which I determine myself, varying according to the season of the year, the stage of growth, and the amount of light at the time of feeding. This part of the program must be worked out by the individual according to his location and its weather.

**One and one-half-inch Pots:** planting medium, yellow osmundine; temperature, same as flats; relative humidity, same as flats; light intensity, gradually increased from 600 foot-candles to 1500 foot-candles; day length, same — 16 hours; time in 1½" pots, 12 months (2 growths completed), elapsed time from seed, 2 years.

During this stage, the feeding program is again stepped up. I transplant from 1½" pots to 3" pots (and from 3" to 5"). I am a lazy man at heart and like to save myself as much work as possible. Needless to say, that large a shift can be made only if the plants have made vigorous growths and a strong root system and the osmunda is in good condition so the roots don't have to be disturbed.

**Three-inch Pots:** planting medium, same as 1½", yellow osmundine; temperature, 68–70°F. nights, 80–95°F. days; relative humidity, 50–70%, or even 80%; light intensity, gradually increased from 1500 foot-candles to a maximum of 4000 foot-candles; day length, same — 16 hours; time in 3" pots, 12 months (2 growths completed), elapsed time from seed, 3 years. The first 10% will flower on the first growth, 2½ years from seed.



LEFT, 2 years from seed. RIGHT, 2½ years from seed with buds in the sheath.

The plants put on a growth about every six months now. If the temperature goes to 100°F. or 105°F. I wouldn't worry about it, but when running that kind of temperature you do have to keep a high humidity. You cannot let it drop below 50% and I feel 70% or 80% relative humidity is necessary for maximum growth. Here again food is applied to a maximum. With the high light intensity it is most important that you build it up gradually. With this increased light your colored-type Cattleyas become very red, while your white varieties lose their green color and become very pale yellow-green.

The method I use to apply artificial light is a very simple one. Spacing 100 Watt incandescent lights at intervals of 5 or 6 feet, suspended approximately 20" to 24" above the leaves of the plants, gives approximately 40 foot-candles which is ample light for this method of growing. A clock is used to turn the lights on and off automatically. The artificial light may be added at either or both ends of the day.

Any locality where there is good amount of sunlight over a long period of the year, such as the coast of California, is an ideal location for this type of growing. This long daylight is needed to keep the plant growing continuously and not allow it to rest. It must be remembered, though, if a period of dull weather appears, a proportional reduction in the length of artificial light must be made.

Another point I feel to be very important is that, when growing with high light intensity, high temperatures and high humidity must be maintained and watering must be increased. These factors, in correlation with feeding, are the most important part of this method of growing seedlings.



LEFT plant 2½ years from seed blooming in 3" pot. RIGHT, plant 3 years old in 3" pot with buds in both sheaths.

In conclusion may I add a word of caution to the uninitiated. I would say — if you are going to try a program of this type, gradually build your plants up to the light you want to run. For instance, if you are growing at 200 or 400 foot-candles, don't try to increase the light to 1500 foot-candles all at once. As you know, it is like a sunburn. A person who has never been exposed to the rays of the sun can step into it and get badly burned in 15 minutes, but, by going into the sun for short periods at a time and gradually increasing the length of time, one can eventually stay out all day without any burn. Your plants are very similar. There is no sense in burning your plants when it is not necessary.

Now, what I have told you can be done by anybody. If you have the necessary elements and if you correlate all the factors, you should have no trouble in flowering your seedlings in 2½ to 3 years. Let us hope we continue to learn a little every year and eventually we will reach our goal — success in the field we love most. — *Vallemar Gardens, Box 125, Sharp Park, Calif.*