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Phalaenopsis Flower Induction (or, How To Make Them Bloom)

Flowering in phalaenopsis orchids is a response to an irritation or a stress caused by (usually) seasonal changes of light, temperature and other external influences. It is a genetically-controlled sequence set in motion by too much or too little of the conditions the plant is comfortable with. It is a worried plant that flowers.

Although we may not notice the changes in growing conditions the plants undergo over a period of time, those changes *do* take place — even in the best-kept growing environment. These are changes brought about by the advancing season. Light levels rise and fall, temperature levels rise and fall, and combinations of the two bring about flowering — with or without our knowledge.

We usually notice the changes when something unusual happens, such as when the greenhouse roof falls in or the heater quits. Almost everyone has had the experience or knows someone who has had a heater go out during a cold spell and, instead of finding the plants set back by the chill as might be expected, has seen them bloom better than ever in the following cycle. This is measured stress: enough to stimulate or irritate the plant but short of harming it permanently.

Most orchids in culture more than 10 years or so start downhill and eventually just die. Ever wonder why so few of the old classics are still around? I believe the answer is stress or, more specifically, the lack of it from an overly comfortable existence. They become couch potato-orchids. A lightly-stressed plant is more likely to maintain its ability to survive — from practice. A plant which is coddled and has every need fulfilled by its grower is often one on its way downhill.

Among the highest achievers in human and animal society are those who stress themselves in an attempt to succeed — stopping at a point just short of a lethal dose. The animal behaviorists call them Alphas, but most of us know them as Type As. Current research indicates that most Type As live *longer* lives, not shorter than the rest of us as originally thought. There's a lesson there for us: lightly stressed plants are healthy ones. No couch potato-orchids here.

Exposure to a cold soak is necessary for flowering of many plants, including grasses, some fruits and ornamentals. Expatriates to the warm climates who bring their favorite tulips or other spring-flowering bulbs with them find they must chill them for a month in the refrigerator to renew flowering.

Mild winters in the temperate zones are usually followed by mediocre fruit and grain crops. Without a hard freeze, vernalization (shortening of the dormant period) will not take place and wheat will not thrive and produce grain the next season.

In the natural situation on western slopes in the Philippines, late autumn and winter bring a flow of cool, dry air off the Asian land mass. The flow sweeps out much of the warm, humid air and clears the skies in many areas. Daytime light and temperature levels rise with the removal of the clouds and haze; nighttime temperatures drop as the earth radiates more heat to deep space in the clear evening air; humidity falls in the relatively dry, crisp autumn days; rainfall is reduced; and air movement is increased as the cool, dry masses of seasonal air flood the region.

Such weather patterns, similar to the "Indian summer" of the United States with its bright, clear, warm autumn days, are common in temperate zones around the globe. They mark the onset of the natural flower induction process for, among other plants, spring-blooming phalaenopsis.

Cultural steps taken to make or improve the flower induction process are best timed to boost the natural effect of the autumn seasonal changes. The timing of the adjustment of the cultural controls should be keyed to the change of season from summer to autumn, worldwide. The first day of "Indian summer" is a good marker, but in tropical climates the induction process should be started when outdoor, nighttime temperatures fall to a range of 58-60°F (15°C).

Inducing the flowering of phalaenopsis in culture involves manipulation of 1) light, 2) temperature, 3) water/humidity, 4) fertilizer, 5) air circulation and 6) potting schedules. Let's look at how they can be adjusted.

Adjustment of Light: Raise by 25-40% the amount of light the plants are receiving — from a norm of 1,000 foot-candles (FC) to the flower induction level of 1,250-1,400 FC (measured with a meter, if possible) at solar noon. This is the time at which the sun is at its highest point in the day. Ideally, phalaenopsis plants should have at least six hours of direct sunlight each day. Maintain the increased light level for 30 days and return to the normal growth level of about 1,000 FC.

Adjustment of Temperature: Increase maximum and decrease minimum temperatures by 5°F (3°C). In most phalaenopsis growing environments, this means setting new limits of 58-97°F from a norm of 63-85°F. While setting a lower minimum may be enough to cause spiking, many experienced phalaenopsis growers agree that widening the daily temperature spread also helps. It may even work to compensate for those climates where nighttime minimums down to 58°F may not be a common occurrence. Maintain the new temperature limits for 30 days, and then return to the normal limits.

Adjustment of Water and Humidity: Reduce water and humidity. Lengthen the watering interval a "modest" amount. It is the time of year to do so anyway, and flower induction is a handy way to remember the change. Lower the humidity to 50% or so, if possible. This will happen naturally with reduced watering, but a change in the misting system adjustment (if you have one) is in order, too. The drier air in the greenhouse will make the wider temperature swing suggested above easier to obtain. Maintain the lower moisture level for 30 days.

Adjustment of Feeding Program: Reduce or eliminate nitrogen fertilizer and increase the phosphorus given to the plants. In the natural setting, reduced rainfall means fewer feedings of dissolved nutrients. The simplest move is to stop feeding during this period, but if you continue feeding, use a high-phosphorus fertilizer such as 2-10-10. Flush pots at the beginning of the period to eliminate as much nitrogen fertilizer as possible. Maintain this modified fertilizer program for 30 days.

Whether or not you give your plants fertilizer during the initial 30-day period, feed with Epsom salts at the rate of 5 pounds per 100 gallons of water, or one teaspoon per gallon for small quantities. This step is not needed in locations if your water supply has excessive levels of magnesium, if dolomitic limestone is used to adjust pH or if foliar analysis exceeds 0.8% magnesium.

Most growers can disregard this step, but if you are serious about getting all that is possible from your phalaenopsis plants, use a high-phosphorus fertilizer from the end of the first 30 days of the induction process until the time when the flower spikes are half developed (40-50 days). Then switch back to balanced feeding for the rest of the year. Some growers use a high-nitrogen fertilizer until the flowers begin to open.

Compensating Adjustments: Increase air circulation to offset the higher leaf temperatures resulting from the increase in light and temperature. You turn on a fan or the air conditioner when you get warm, right? You certainly can do no less for your phalaenopsis. As is the case whenever making adjustments to the growing environment, look for the secondary changes needed to keep the plants comfortable and healthy.

For phalaenopsis in culture, a balance in growing conditions is necessary. When you change one control, look for the compensating change that must also be made. If you increase the light to induce flowering, increase the air circulation, too. But do not increase nitrogen; flower induction is an exception to the usual rule of high light-high nitrogen, low light-low nitrogen.

Adjustment of the Potting Schedule: Repot in the time window of 60-120 days before the beginning of the induction process, if this is at all possible. Add the impetus of the burst of growth that follows 2-4 months *after* repotting to the flurry of activity taking place during the induction. Repotting *within* 60 days of induction can reduce the rush that the plants experience during the process and dampen the total effect of the induction process.

By repotting 2 to 4 months before Indian summer, all of the plant's excitement is concentrated in the month of the other steps and a doubling effect is achieved.

Having said all that, chances are good that even if you do nothing outside of ordinary, good growing practices, most of your mature, healthy plants will still flower. But the steps I've outlined here will help ensure that all the plants that are *able* to flower will do so and do it well. It is not uncommon to have plants with 3-and 4-inch leaf spans in bloom using this technique. It makes sense to cut these flower spikes off when you've seen what they look like, of course. In making these changes to induce flowering, keep in mind that each change in cultural conditions probably needs a balancing change to keep the plant things in harmony.

When To Cut the Spikes

To conserve the plant's energy and force it to rest in preparation for a good presentation of flowers in the following blooming season, cut the flower spike off at its lowest point with a sterilized tool. Do this on the first day of the flower induction process— the beginning of autumn. This step prevents an enzyme produced in the nodes and tip of the spike (which keeps the plant in the reproductive mode) from entering the plant, thus allowing the plant to devote all its energies to growth following a brief rest. However, *do this only on those phalaenopsis that bloom in the spring*. Do not cut the spikes of ones that flower in the summer; these "summer bloomers" flower more profusely when spikes are allowed to remain.

"Summer bloomers," those phalaenopsis with a primary flowering season in June, July and August in the Northern Hemisphere, are unaffected (and unharmed) by the flower induction processes detailed here. It is not necessary to separate them from their spring-blooming benchmates during the induction steps. There is reason to believe that they respond to long-day conditions and are stimulated to bloom by the lengthening days of summer (actually short nights). The following species (and their primary hybrids) bloom most frequently during summer months in the temperate zones. This list may not help growers who have complex hybrids made with these species because of the unpredictability of dominance in flowering habit when they are bred with plants having a different flowering
season:

Phal. amboinensis, Phal. corningiana, Phal. cornu-cervi, Phal. fuscata, Phal. lueddemanniana, Phal. lindenii, Phal. mariae. Phal. sumatrana, Phal. venosa and *Phal. violacea.*