

More on Orchid Culture

The biggest favour you can do yourself is to observe. Ernest Hetherington who is the grand old man of cattleya breeding and culture, stresses observation in all aspects of growing and breeding orchids. It is what sorts the great growers out from the could have beens. If you don't learn from your mistakes or successes, you will never get anywhere. Some of the ideas are new but others that I thought were new, after some research back 30 years, to my amazement, I have discovered that they were known or at least hinted at, yet culture sheets and beginners books seem to ignore them. I have brought in an ivy to demonstrate the way most of us begin with orchids. We buy one, set it on a table, water it when we think about it and rarely fertilize it. Sometimes we get lucky and they live and bloom. But we have many disappointments. So we buy more and perhaps have 20 around and are satisfied with having something in bloom part of the year. We grumble that they are a bit fussy and that is the problem. Actually, most healthy orchids are not too fussy so long as we remember that they have a few rather specific requirements and that we often don't pay enough attention to them.

The first is that most grow on ROCKS OR TREES—the tropical ones that we all grow, that is. A few paphs and others grow in leaf mulch or on rotting fallen trees. What is so important about this. ASK AUDIENCE? Two things: the roots are not in dirt and they either grow externally on something or in a very loose mulchy substrate. WHY IS THIS SO IMPORTANT? Because they grow on trees or rocks, they are not adapted to the high mineral content of soil. They are bathed in relatively pure rainwater or fog that has little or no mineral content. Where they do grow on rocks, which are well weathered, and while these release some mineral, mostly calcium and magnesium salts, it is rather dilute. (This is why the addition of a little Ca-Mg to paph mixes when using pure water can produce better growth.) All this leads us down the road to water. IF your water is hard, it can stress your plants because they are not adapted to the high mineral content. The main reason for the fertilize weakly-weekly regime is that it ASSUMED that you will be using poor quality water and, therefore, to try to prevent you from burning your plants with fertilizer salts, they recommend that you grossly underfertilize. Most commercial growers do not do this. They fertilize either somewhat dilutely with EVERY watering or on a weekly basis with a higher amount no matter how often they water. I surveyed a number of commercial growers and they are using 100 to 275 ppm of N when they fertilize. The higher rates of commercial growers were being used on catts and other heavy feeders and the lower rate on paphs. The woman who was featured in the June 2003 article on fertilizer in Orchids was using 175 ppm on a vareity of 'botanicals'. The quarter strength recommendation would give you more like 25 to 35 ppm. So the number one lesson is that most of us are underfertilizing. More on this later.

The second important cultural factor that we get from the observing orchids as epiphytes in the wild is that the roots are either exposed or growing in a very loose media. But there is a postscript to this observation: IF you read the descriptions of where these plants grow—the ones on trees—you will find that very often they have lichens or moss between the roots and the tree OR they grow along rivers where they are bathed in fogs, mists and the general humidity of the area. Riverine populations thin out to nearly nonexistent a few kilometers away from the water source. Now it is true that some types are adapted to grow in areas with dry seasons. But they usually are dormant or semi dormant at those times and make their growth and then flower during the wetter seasons. We can use two observations from this in our culture: first, many orchids, particularly cattleyas can take a dry

period BUT growth ceases or subsides. Since we are looking for optimal growth, then growing them exactly as in nature may not be optimal. (Hold up dendrobium.) I have been told over and over that to flower nobile type dendrobiums well, you need to withhold water in the winter. The idea was also that watering in winter produced keikis, or baby plants, instead of flowers. Well, between watering the same the year around and using the high potassium fertilizer, my growth is much better, more flowers and note the flowers on the stems that still have leaves. I hardly ever get keikis any more. The other observation is that the roots prefer to be next to some moisture holding substrate such as moss or lichens, where possible, while at the same time maintaining an environment that is open to the air. (Hold up Miltonia, take out of pot and show how roots are wonderful but grow along the edge.) So you want a media that holds some moisture—less for catts or phals perhaps but more for the fine roots types such as miltoniopsis or pansy orchids.

Light is another obvious part of culture. How many of you own a light meter? So you really don't know what sort of light you are using. Natural light in terms of culture has two main effects: intensity and number of hours. In Florida and southern California where most of the cultural information we have originates from, day length is not too important. Winter days are still perhaps 80 or 85% as long as summer days. The problem for us in Nova Scotia is that winter days are effectively not more than 50% of summer days. By effectively, I mean that there is a longer period after sunrise and before sunset where the sun is so low on the horizon that the atmosphere reduces the light intensity to something less than needed for growth and photosynthesis. So our orchid culture in terms of day length runs a roller coaster ride from winter to summer. So how do we cope: by providing some shade in the summer to reduce the light intensity and by adding artificial light in the winter, although it is still useful to have longer days in the summer. The orchids just don't need the extremes that we have in Nova Scotia without intervention.

The other aspect of light is intensity or roughly how bright it is. The genera of orchids vary as to how bright they like to grow. So by studying their requirements, you can try to give them what they need. Generally they will tell you: yellow or red leaves, too much (by the way, the red pigment is nature's way of reflecting the light away from the leaf, thereby reducing the intensity on the leaf); very dark green leaves, too little. There are a couple of problems associated with light intensity, however. The first is to try to optimize the light intensity while keeping the leaf temperature low. You do not like to cook in a window—neither do your orchids. If you aren't comfortable, neither will they be. Feel the leaves, if they are warm or hot, DO SOMETHING!!! The easiest is to provide more shade or more air movement with a fan. The other is to provide a cooling mist but that must be continuous as just misting hot leaves will cool them momentarily but the water on the leaf can then warm up and act like a magnifying glass and cook them even more. However, the trick is to have the highest light without stressing the plants to obtain the best growth and flowering PROVIDING that you are also fertilizing adequately. This means that as the light intensity increases in the summer, you need to provide more fertilizer than during lower light and cool temperatures of winter. Providing more fertilizer along with adequate watering and air movement in summer can dramatically increase the number of growths and therefore the number of flowers. I have found that combining slow release pelleted fertilizer spring to fall along with the normally delivered fertilizer in the water provides the 'extra' that the catts and phals need during the summer. Stewarts use it on their phals and grow them in Mississippi in the same light and temperature as their cattleyas!!!! Paul Cabilio experimented with this in Cymbidiums and many of us have followed suit because

the results are so good. Using aged manure in cymbid mixes is the same idea: smaller amount of constant slow release. The pelleted fertilizer releases more as the temperature rises.

Now there is a final note on light intensity and day length. They are related but it is not as simple as 12 hours at 3000 foot candles is the same as 8 hours at 4000 foot candles. And this is where the rub is for northern growers. The Hawaiians and Florida growers recommend 2000 for this plant and 3000 for that type, etc. With our long summer days, we cannot equate 3000 foot candles for 16 hours of daylight here with 13 hours at 3000 foot candles in the Florida. For optimum growth, we need to reduce the light intensity to perhaps 2200 or 2400 foot candles to get the same thing. We also get a higher intensity light than fellow growers in Ontario who have to deal with smog. I have found that I need to use about 20% more shade in the summer than I did in Ontario. That is when the sun is shining of course. In Halifax and along the south shore you will have to contend with fog in the late spring and early summer.

Yet another point on light intensity recommendations given out by the AOS and commercial growers is this: most growers are GUESSING at their light intensity, just the same as you are. It may sound all scientific but most of them have not taken a reading in years. A buildup of water spotting, etc on the glazing provides some natural shade. Also if you take light measurements in a greenhouse, you will find that the farther you are from the glazing, the lower the light will be. Most large commercial greenhouse operations like Carter and Holmes, Stewarts, H&R, etc have ceiling heights in their greenhouses which place the glazing much farther from the bench than in sunrooms, hobby greenhouses or windowsills. They also usually pack their plants in like sardines, which naturally shades them as well and provides a curtain of humidity that you lose on well spaced plants in a windowsill. The Vanda growers in Thailand grow them in shade houses in tightly packed rows. I am guessing that the effective light intensity 12" below the top leaf is half of what they are suggesting as ideal light. The point is that commercial greenhouses are not windowsills and can tolerate higher theoretical light levels.

The moral of the light story is to listen to your plants and only use recommendations in a rather broad sense: for example, phals and paphs, less light than cattleyas. If you are getting burned spots, they are getting too much light or need increased air movement.

There is another 'thou shall not' that I need to mention. If you want to grow bugs, then don't grow orchids. The bugs will win. The rule of thumb is that if you see mature scale or mealy bugs, then you have 100's of immature ones that you cannot see that are crawling around sucking the juices and life out of your plants. (SHOW TWO BUGGY PLANTS). The three most common remedies for windowsill or light growers are Safer's Insecticidal soap, End-all and Neem Oil. Safer's is just a mixture of soap and water and it suffocates the bugs and doesn't harm you or the plants. It is good for aphids, some control on mites and very limited control, not eradication, of scale. End-All, also made by Safer's, is a combination of insecticidal soap and pyrethrin, which is an organic made from chrysanthemums. It gives better control, is a good miticide and does a better job of controlling scale, although it does not eradicate it. Neem Oil is the oil of the neem tree and is another organic product. It also can control scale. A lot of people use it and swear by it, but I am a bit leery of it because it works by suffocating the bugs with a layer of oil. As you use it repeatedly, it builds up. I worry that it will eventually slow down or suffocate the leaves. Remember orchids respire through the leaves, if you block that, photosynthesis will shut down.

Another biggie is fertilizer. I have already mentioned that most people underfertilize. However, the other aspect is what we fertilize with: some sort of commercial formula such as 20-20-20 or 30-10-10 as opposed to an organic fertilizer such as manure or fish emulsion. The latter has its uses in that micronutrients, that is those elements other than N, P and K, may be deficient for optimum growth. They are usually only required in very small quantities, however. Manure and fish emulsion may provide the missing ingredients. Selenium in fish emulsion would be an example. So using it once in awhile isn't going to hurt anything. However, the workhorse of fertilizer is the water soluble stuff made by Schultz, Peters, Plant Prod, etc. The rule of thumb has been to use more nitrogen for growth in the summer and a bloom booster at times to get more buds. A bloom booster was something with a high middle number, which is the phosphorus. However, relatively recent research for the pot plant market and hydroponic growers found that potassium, not phosphorus, was the magic bullet for more flowers. Michigan State University picked up on this idea and tried it for orchids. Great. But they also went one step farther. They made up two formulas, one for well water, which recognized the higher tds content, and one for RO or rain water which needed Ca and Mg added back in. The results were spectacular: better growth, more flowers. I have been seeing the same effect. My Hazel Boyd has one spike with 6 flowers, two with 5 and a smaller, later one with 4. 80% of the awarded Hazel Boyds have had 3 or less flowers per spike. Do the math. And I have been flowering paphs that I have had for 4 or 5 years with no flowers. All this is just a good example of the myth of culture in the orchid world. A few early growers were successful growing in their microenvironment and those generalizations were passed on as the Ten Commandments of orchid growing without really being investigated or questioned scientifically. **YOU MUST OBSERVE AND THINK.** So that brings me to a final aspect of culture. What we grow in. And just like everything other aspect, there are the myths and commandments that may not work for you. Always remember to watch and if what you are doing isn't giving the results, then try something else. I convinced my son, William, to take on some of my seedlings that had arrived and try growing them in four common media. He will tell you how it turned out: