

Hydroponics, and First Rays' "SEMI-HYDROPONIC™" Orchid Culture Technique

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Most experienced orchid growers will acknowledge that the majority of orchid culture is hydroponic in nature, as the medium is there primarily for mechanical support, and provides little, in any, nutrition to the plant, with that being provided by the nutrient solutions used.

When most folks think of hydroponics, it's in the context of "ebb-and-flow," nutrient film, or nutrient mist (aeroponic) culture techniques. I don't feel that those are appropriate for orchids, due to the possibility of pathogen transport through the nutrient bath, not to mention the costs involved, so I have experimented for years in an effort to find a culture technique that provides the best conditions for the plants, as well as a minimum in labor for the grower.

I grow nearly all of my personal collection of plants in individual-pot hydroponics, using PrimeAgra® spherical ceramic media, in what I refer to as a "semi-hydroponic™" method (don't get hung up on the name, it's simply a way to differentiate it from the methods I described above):

For **containers**, I use custom-made plastic pots ([available from our online store](#)), but have, in the past, used painters buckets, food storage containers, trash cans, etc, with closed bottoms. I have even used Styrofoam coolers. Those pots have two or three quarter-inch diameter holes about one inch up from the bottom on the sides. The function of the design is described below.

The **medium** is another key component of the culture technique; it must be inert so it won't decompose, fairly uniform in particle size so it provides lots of free air space, and must provide good capillary (wicking) action to keep it uniformly moist. I started this culture technique using a custom "semi-hydroponic™" medium, which was sponge-rock (very coarse perlite, with chunks typically 1/2-3/4") and coarse charcoal, mixed in about 50-50 ratio, and, although it had a reasonably long life, it was not reusable, and over time, root growth appears to break down the sponge rock, which limits air flow. After much experimenting, I have found a medium that really fits the bill: one-half-inch diameter **PrimeAgra™ spherical ceramic medium** that can be reused indefinitely. Click on that link for more details about the medium. If you want to see how PrimeAgra® compares to other inert, inorganic media, [click here](#).

Potting is very similar to that with more traditional media, except that, instead of compressing the medium around the roots as you pot, you want to shake the pot when pouring medium around the roots, so it will get into the spaces within the root ball. Pot your plants to a normal depth. Be sure to soak the medium thoroughly (I prefer overnight) before potting. Adding Dyna-Gro K-L-N Root Grow to the presoak also helps.

NOTE ON SIZE OF MEDIUM TO USE: Most clay aggregate materials are available in fine and coarse grades. We recommend the **coarse** grade for almost all plants, with the exception of small, really fine-rooted plants such as pleurothallids or tiny seedlings. If you try growing larger

plants in the fine material, you will likely experience root rot in short order. Don't be too concerned about using coarser material for fine-rooted plants, as they seem to adapt to it quite well - [click here to take a look](#).

Watering is done quite infrequently, approximately every one, two, or more weeks, depending on the season. We recommend feeding a somewhat dilute nutrient solution at every watering, and all of our plants get either Dyna-Gro "Grow" (5-9-7) solution or the MSU-type fertilizer at a nitrogen dosage of about 100-150 ppm. When using the Dyna-Go in my reverse osmosis (RO) water, we also add about 1/4 teaspoon of Pro-teKt to bring up the pH, and about once a quarter, I'll add 1/2 tsp./gallon magnesium sulfate [Epsom Salts] to the solution as a supplement (neither is necessary with the MSU fertilizer, as it provides the proper pH range in RO, and has plenty of magnesium and sulfur already). Notice I don't water constantly...that's why I call it "semi-" hydroponic.

The watering technique is dependent on the pot used: when watering plants in our "semi-hydroponic™" pots, fill the pot to the top. It saturates the mix and then drains down to the level of the holes, which leaves the mix nice and airy, while providing a reservoir to keep it moist by capillary action. If you're using the two-stage hydroponics pots with gauges, we have found that it's best to stop adding solution at the moment you see the gauge just begin to move up from the bottom.

Paphiopedilums, Phragmipediums, Masdevallias, Phalaenopsis, Cattleyas, Cymbidiums, Oncidiums, Dendrobiums, Epidendrums, Miltoniopsis, Pleurothallids and Zygopetalums all do great for me, along with a variety of other miscellaneous genera. I've not had the guts to try vandaceous orchids as yet, but I'll get there eventually. Bromeliads and tropical house plants also thrive under the conditions. **DO NOT** try any tolumnias in S/H culture - they just don't go for it!

For those of you who have a tendency to "over-pot" plants, this culture method may offer you a real "plus," as it appears that plants do quite well in large pots. For example, several years ago I moved an Oncidium Sharry Baby 'Sweet Fragrance' AM/AOS from a 3" pot of bark mix to a 12" Semi-hydro pot, and it has bloomed reliably ever since. In September of 1997, it had 4 spikes carrying over 300 blossoms! When carrying it back to the greenhouse from the household display location (my kitchen), I dropped it, breaking the pot. To my amazement, the entire 12" diameter by 14" tall pot was just FULL of roots!

I know there is no "universal culture method" that is perfect for every grower and every genus, but I believe that the semi-hydroponic™ technique comes pretty close. When using the PrimeAgra® medium and the Dyna-Gro nutrient combination described above, I observe the following:



The plants are healthy and strong, and bloom reliably. Generally, I see improved size, color and durability in the blossoms.



There is always a readily available moisture and food source, eliminating the stresses put on a plant when those are lacking or only available intermittently.



It appears that one cannot overwater, as the pot design maintains a maximum level, and the medium controls the distribution.



Root rot is virtually eliminated, as the airy nature of the medium, coupled with the holes in the side of the pot, allows plenty of air movement and gas exchange to keep the root zone fresh, and not saturated with carbon dioxide.

There is no noticeable salt buildup, due to the nature of the nutrients, the structure of the



medium, and the flushing action of the dilute solution.

If you have some experience growing orchids in this manner, please fill out our "[Feedback Form.](#)"

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