

needed to find the right combination for shoot multiplication. Once this is discovered, there is no end to the number of plants that can be produced. Later, some plants are moved to nutrient media with root-inducing hormones at different concentrations. In about a month, the plants can be transferred to soil.

Tissue cultured plants are transferred to soil much like tender seedlings. The nutrient media is first washed off to prevent disease organisms from starting. Roots are gently covered and the plants watered in with a ¼ strength solution of liquid fertilizer. The container is covered with clear or opaque plastic or glass to reduce light and hold in humidity. This cover is removed a little more each day over seven to ten days. The plants gradually adjust to their new environment.

Laboratories worldwide now produce tissue cultured ferns, orchids, African violets, as well as many other tropical plants. Some rare plants are becoming plentiful. Countries that restrict imports of soil grown plants can now receive plants *in vitro* in sterile conditions, making more varieties available to everyone.

FURTHER READING

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WHY THEY DO OR DO NOT GROW

by Don Schnell

How many times have those of us who grow CP noted one or both of the following events?

An article appears in CPN or some other publication going into great explicit detail about how a particular CP species can be grown—indeed, the author may insist that it *must* be grown the way he outlines or your plants will surely expire. You smile smugly and comment that you have been growing the same species a completely different way and the plants are perfectly healthy, or you come across one or more additional articles, these perhaps describing completely different ways of growing healthy specimens.

The second event is that you read a superbly detailed article about how to

grow a CP to exquisite perfection. Everything seems to be there in print—water, pots, soil, fertilizer or no, light, etc.—Everything. So you set out, follow the direction to the letter, and your plants promptly go under.

This has happened to all of us, and woe be to the poor author beleaguered with smug or angry letters, respectively.

Are the authors right? Are they wrong? Well, they may be neither, or both. It comes down to a matter of perspective. There seem to be few absolutes among life forms, and many relative factors affecting them. And after that five cents worth of philosophy, let's see what might have gone wrong—or right.

In the first instance, where the plant does not seem to be as fastidious and

fussy as implied, this is probably true. If we look to the way things look in the field (that always helps), how about those *Sarracenia purpurea* ssp. *purpurea* that thrive—as expected in nice, cool acid sphagnum bogs in the north country—but also in alkaline, open sunny and often hot marl-sandy fens in the same region? This is just one example. It illustrates that seemingly delicate species may indeed have more latitude than we expect.

Remember, growing plants out of habitat in pots in greenhouses or under lights or two thousand miles away from where they naturally occur is a stress. Even the finest appearing plants in cultivation are under stresses not present in native habitat. So the plant may well react atypically. Also, CP are generally held to be poor competitors ecologically. Once a native habitat is changed in such a way that the soil or hydration becomes more conducive to competitive plants that were previously held at bay, the poor CP's are often overwhelmed.

The grower in the first instance mentioned above, then, may have undefined stresses in his particular area that preclude his CP being grown in any other but his way in his locale. But as we saw above in the *S. purpurea* example, a species may actually be quite diversified in its requirements once a basic few have been met, perhaps plenty of water that is generally non-toxic, and little competition. So, if you are going to describe how you grow CP, be wary of the use of *always* and *must*, and remember you are describing a growing system that works for you where you are, under your conditions.

Now how about the detailed failure in the second example at the beginning of this article? Actually, pretty much the same principles we have been discussing apply. In the second instance however, the grower describing his technique may well have overlooked one or more factors important in his growing system in spite of the detail of his report. Is he careless? Not at all. There may be some

undefinable variabilities in his growing system that perhaps no one could notice causally, that might perhaps require detailed research and study. Maybe he has too much boron in his water he uses. Who might know this right off, or what difference it would make in combination with all the other variables?

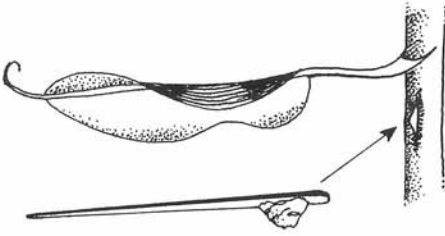
So, when you read a very nicely detailed article on how a grower manages his CP species, remember it is *him* in *that locale, under those circumstances*. There are many things we take for granted or cannot easily know (at the other extreme) that would not appear in a list of our observations.

Well then, is it indeed hopeless writing and reading all these articles on how to grow CP? Absolutely not! Quite the opposite. The only hope is to continue our horticultural endeavors and pass on our observations to our fellows. Horticulture is itself a science and contributes far more to our knowledge of plants than some of our botanist brethren might care to admit. It has been said you do not really know a plant until you have grown it—or tried to. So the botanist who rarely sees the inside of a greenhouse or holds a pot in hand, is really missing the boat. Each stressed growing attempt is itself an experiment if we try to define and control conditions to the best of our ability.

The important lessons, then, seem to be that if you write an article on how you grow CP, remember that your conditions are relative, and open your mind and text to other factors or variables. If you read an article on how to grow a CP species, remember that the author may well be describing all growing factors in seeming detail, but there may be so much more he cannot have easily noticed. For instance, even in a heated or air conditioned greenhouse controlled to the same temperature and humidity, the daylight photoperiod is going to be a lot longer in Ontario on June 21st than it is in Florida. Did anyone think to consult the almanac, or any one of a hundred other things? (Continued page 102.)

Why They Do *(from page 97.)*

As we continue to offer and acquire our knowledge among ourselves, certain patterns begin to develop among all the articles and experiences, and it is from these patterns that we can learn and ultimately successfully grow that CP. So, continue to write and read and grow by all means, but do so in perspective.



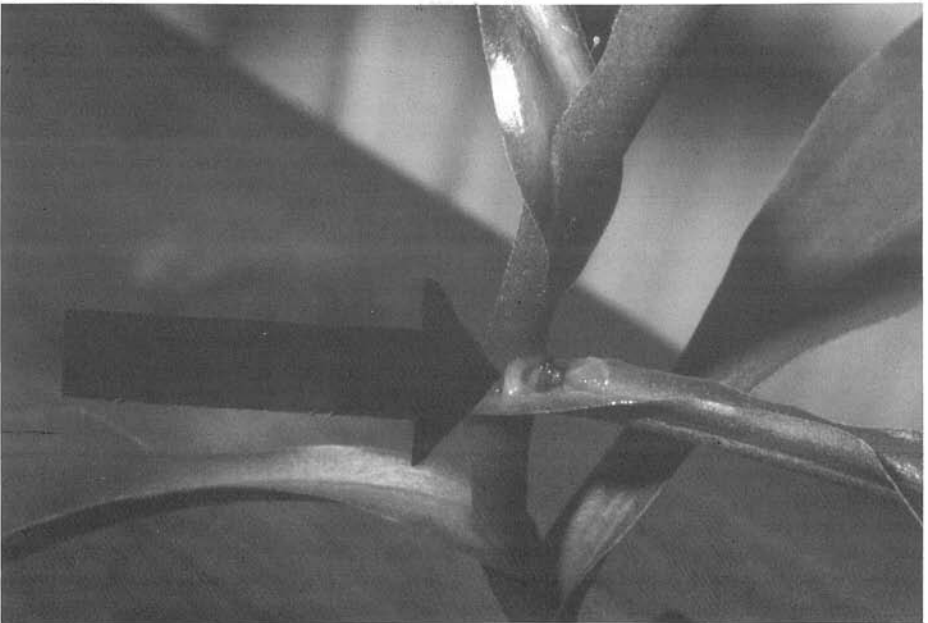
Approximately quantity of hormone to be used on toothpick as an applicator. Position of dormant bud on nodes occasionally is further down or even completely behind leaf axil.



Emerging young side shoot triggered by the application of hormone.



Examples of short and long leaf cuttings.



Emerging shoot at point of hormone application.

Photo by I. Kocsis.