



St. Augustine Orchid Society

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Virus Testing – Do You Really Want to Know?

by Sue Bottom, sbottom15@gmail.com

Approaches range from simply not wanting to know to wanting a virus free collection. Whether or not to test your orchids is a very personal decision that each grower will ultimately have to make.

Most people simply do not want to know if their plant is virused. Denial is a temptress. We all want to believe that life is fair and only good things happen to good people. It is perfectly fine to assume all your orchids are virus and disease free, as long as you hedge your bets and act as if all your plants are virused, so you follow stringent sanitary practices when handling any of your plants. If you find plants that are potentially diseased or exhibit the symptoms of virus, you have to be brutal and simply discard any and all questionable plants.

At the other end of the spectrum are those that want a virus free collection. This group might include orchid hybridizers, who do not want to transmit virus to their new hybrids. A virused plant should not be used as the pollen parent because the virus would be transmitted to the offspring, but a virused plant can be used as the pod parent as long as the seed from the mature, dried capsule is properly sterilized. Of course, the hybridizer must know which, if any, of his plants are virused so the proper precautions are taken. Hobbyists may want a virus free collection so they do not have to worry about virused plants infecting the rest of their or their friends' collection. They are willing to go to the considerable expense of testing each and every plant and discarding any plant that is virused. Then, in order to maintain a virus free collection, every new plant purchased must be tested.



1. Often Cymbidium Mosaic Virus causes black blotches on the leaves that result in a really ugly plant, although there are other diseases that can result in black splotching besides virus.



2. Sometimes Odontoglossum Ringspot Virus causes circular to angular patterns on the leaves with the discoloration ranging from yellowish to reddish to brownish in color.

My Sainted Mother told me to never ask a question to which I did not want to know the answer. Too bad my evil sister-in-law did not learn that lesson before asking what I thought of her. So it is with virus testing. If you decide to move forward with virus testing, think the whole process through in advance and be prepared for some heartbreak. My approach was to start testing the most at risk plants, those that are in 8 inch pots and have been through the division process multiple times so they have the highest potential to be virused from contaminated cutting tools and potting surfaces.



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Easy Decisions. Any plant that exhibits the symptoms of virus is either simply discarded, or discarded after testing confirms the presence of virus. Plants with the blotchy black necrotic spotting may have Cymbidium Mosaic Virus (CyMV), and those with angular V shaped markings may have Odontoglossum Ringspot Virus (ORSV). Once the symptoms of virus are visible in the leaves, the plant is simply too ugly to keep in the greenhouse. Even worse are flowers that exhibit virus symptoms. ORSV causes color break. CyMV does not usually express itself in the flowers, but when it does, it causes blossom brown necrotic streak (some say a dual infection with CyMV and ORSV is required for the necrosis to occur). In any case, any plant that is obviously infected with a virus is discarded because it is simply too ugly to remain in the greenhouse.



3. Blossom brown necrotic streak from CyMV (generally thought to be in combination with ORSV) shows up 5 to 10 days after the flower opens, resulting in unsightly discoloration on the floral segments.



4. Color break from ORSV is an irregular, nonsymmetrical marking on the flower. You might simply discard the plant with apparent color break, but thrips and chemicals can cause similar blemishes on the flower.

Difficult Decisions. The tough decisions arise when you decide to test your entire orchid collection for virus, even those that don't exhibit any symptoms. You have a plant that is growing well, has no leaf discolorations, no flower blighting, but it tests positive for virus.

- ✦ If the vigor is compromised or the flower is nothing special, it is discarded knowing there are many many new seedlings growing up that will be glad to take its place.
- ✦ If this asymptomatic plant tests positive for ORSV, it is discarded to avoid potentially spreading the disease to other plants. ORSV is the primary flower blighting virus, and to avoid spread to other plants, infected plants are discarded.
- ✦ If it tests positive for CyMV, it is evaluated on the basis of its growth vigor and flower quality. Vigorously growing otherwise healthy plants with drop dead gorgeous flowers are moved to a virused bench, to isolate them to some extent from other plants. Here, extraordinary sanitary precautions are taken to prevent spreading the disease.

We became familiar with the five stages of grief at Chez Bottom during virus testing:



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- ✦ Denying the existence of virus (we use strict hygiene procedures... but what about the early days?)
- ✦ Being angry with the vendor (but the plant has been in my care for all these years)
- ✦ Bargaining with the orchid gods (how can I get the plant to outgrow the virus?),
- ✦ Being depressed (what a failure I am at orchid growing), and finally
- ✦ Accepting facts as they are (guess this means I will have to buy lots of new plants and be more careful going forward).

Virus Testing. The test involves cutting a small sample of tissue from the plant, mashing it in a buffer solution and inserting the test strip to wait for the results to appear. If you decide to start a virus testing program, be exceedingly careful to not spread the disease during the testing program. Put on fresh gloves to test each new plant, use newspaper or butcher paper to provide a clean working surface, changing it between plants. Use single use double edge razor blades to make your cuts.

Very little is written about exactly where to obtain the sample. Some like to sample an almost spent flower, some sample the roots, and others the leaves; but, which leaves? I had always sampled the older symptomatic leaves under the assumption that these had the most time for the virus to replicate inside. The Good Doctor Hackney says he always tests a leaf from the youngest mature growth because that is where the virus will be most concentrated. Per Randall and Ogle:

When the virus reaches the vascular tissue, it is distributed rapidly through the plant via the phloem and becomes systemic. Viruses generally move first to the roots and top leaves before infecting the remaining leaves from the top of the plants downwards.

The phloem, which transports sugars and carbohydrates throughout the plant and fuels the growth of newly developing tissue, also carries the viral particles concentrating them in the new growths. It is possible for the virus present in the older parts to become dormant and test negative, even though the virus is present in the plant.

To get the best flowering, you need a vigorously growing plant that has enough energy in reserve to bloom to perfection. The corollary of this is a poorly growing plant will never have the wow factor. It may grow poorly as a result of a disease, from which it can recover, or from a virus, from which it will ultimately fade away and possibly infect other plants along the way. In that the greenhouse is not a hospital for sick orchids, plants that have unexplained poor growth are simply discarded. If you find this too painful, keep a small inventory of test strips on hand so that you can test suspect plants and make an informed decision as to whether you want to discard the virused plant, isolate the virused plant or try to nurse the non-virused plant back to health.

Citations and Additional Reading

Randles J, Ogle H. 1997. Viruses and viroids as agents of plant disease. In: Brown JF, Ogle HJ, eds. Plant pathogens and plant diseases. Australia: Rockvale Publications, 104–126.