



St. Augustine Orchid Society

www.staugorchidsociety.org

Edema – Blisters on Orchid Leaves

by Sue Bottom, sbottom15@hotmail.com

When I first noticed those corky blisters on the leaves of my orchids, I thought it was some kind of aberrant scale. I tried scratching them off and even tried excising them with an exacto knife, though of course it wasn't scale at all. The culprit was edema, also known as oedema. Edema is swelling caused by excess fluids.



The blisters are always raised, as in this bifoliate cattleya that just developed edema. Sunken spots would be suggestive of a bacterial infection causing a collapse of the cells. Sometimes edema is mistaken for scale, though scale can easily be rubbed off with alcohol and a Q tip.

In orchids, this swelling is caused by improper watering, when the roots absorb more water than can be transpired by the leaves. Typically this happens during the cooler months in late winter and early spring especially during extended periods of cool, cloudy weather. If you water on a gray day when the plant is not actively growing or you water late in the day on a day when the night time temperatures turn cool, edema blisters may form. The excess water absorbed by the orchid causes a swelling of plant cells that produces a blister on the leaf.



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Proper watering is the key to preventing edema blisters from forming. During the warm growing season when plants are in active growth and the nighttime temperatures are warm, you can water your plants with wild abandon. You can water in the morning, the afternoon or at night. In fact, when the humidity is very low, many orchid growers find it difficult to properly hydrate their orchids because they dry out so quickly.



The edema on this cattleya leaf shows the blistering effect from the swollen plant cells.



In severe cases, the raised blisters can coalesce as on these cattleya leaves. Though they are unsightly, the blisters do not spread or otherwise damage the plant.

Some selectively water in the evenings after the sun has set so their plants will stay wet overnight and soak up water. Fertilizer shouldn't be applied in the evening hours. Darkness, plus water plus nutrients is a formula for fungal and bacterial growth. Most



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orchids grow in a nutrient poor environment so even though the plants may be wet at night from heavy dews and rains, there is insufficient food to fuel rots and the like in nature. If you decide a night time watering regime is right for you, water at dusk and then apply your fertilizer in the early morning.

My go-to guy Courtney Hackney recommends night time watering during periods of low humidity and warm night time temperatures and notes some of the additional benefits from this approach. Your plants will be well hydrated so you won't have to worry about fertilizer toxicity. The roots will be ready to take up fertilizer as their surface condition has changed from hard and stiff to soft and pliable. If you live in an area with hard water, salts that accumulate on the medium, pots and roots will become soluble overnight, allowing them to be flushed out the next morning while fertilizing. Once night time temperatures drop below the 65 to 70°F range, you should resume the more conventional morning watering regime.



This phalaenopsis leaf recently developed edema. There are translucent blisters with green tissue underneath while others have a corky appearing section in the middle (the blue spotting is the residual from a copper fungicide spray).



The raised blisters are clearly displayed on this phalaenopsis leaf. Some of the edema is translucent while some has taken on a corky appearance. (image sent to www.staugorchidsociety.org for diagnosis).

Watering during the cooler months is quite different than during the main growing season. Many orchids go through a winter resting period and some an outright dormancy. The orchid's need for water and fertilizer is at a minimum. Your frequency of watering will be



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perhaps a quarter or a half of your summertime watering frequency. Water early in the morning, finishing before noon or so. Don't water on gray or rainy days even if it is your 'scheduled' watering day.

Orchid growers spend a lot of time worrying about different pests and diseases that might be afflicting their orchids. I have come to believe that there are more physiological and cultural issues that cause problems with your orchids than those caused by pests and diseases. If you access to the AOS Guide on Orchid Pests and Diseases, read or reread Tom Sheehan's discussion on physiological disorders caused by improper watering, light, nutrition, potting faults, etc. His comments are as true today as the day they were written.



Edema can also be expressed on the flower segments, as on this cattleya. In fact, edema can form on upper or lower leaf surfaces, stems, petals or sepals.

Additional Reading:



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Physiological Disorders of Orchids: Oedema, Cating, R.A., Palmateer, A.J., Stiles, C.M., Harmon, P.F. and Davison, D.A., University of Florida, IFAS Extension, Plant Pathology Department, PP244, Revised April 2014 (<http://edis.ifas.ufl.edu/pp164>)

Physiological Disorders of Orchids, Sheehan, Thomas J., PhD, *Orchid Pests and Diseases*, 2002 Revised Edition