



St. Augustine Orchid Society

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Blackened Tips on New Cattleya Leaves

Calcium Deficiency After Repotting

by Sue Bottom, sbottom15@gmail.com

Some of the newest growths of several cattleyas in the greenhouse had black leaf tips, suggestive of calcium deficiency. Calcium is an essential nutrient required for optimal growth of your orchids. A brief refresher from an earlier article:

Calcium is absorbed through the roots and moved upward through the xylem via the transpiration process. It increases cell wall thickness and strength among other things as well as a plant's resistance to fungal and bacterial disease. The plant requires calcium the most during periods of active growth, while it is building new tissue. It must be supplied to the plant in proportion to its growth rate. Calcium is mostly immobile in the phloem, so the plant cannot translocate it from older growths to the newer growth, like it can some of the other essential elements... The most obvious sign of deficiency is rapidly expanding tissue that becomes necrotic, such as a newly forming leaf...



1. What causes the black tips on newly formed cattleya leaves?

It is easy to mistake calcium deficiency for the symptoms of other disease or cultural problems. Black rot is a very rapidly moving disease that often starts in the pseudobulbs and moves upward through the plant killing within days. Bacterial rots from excess leaf wetness during the rainy season is likewise very rapid and tender young tissue is commonly affected. The black necrotic tissue from calcium deficiency is a slowly advancing problem that takes weeks rather than days to traverse down the leaf. It is unsightly, but does not produce the putrid odor of the water molds or bacterial rots. Anthracnose in thin leaved orchids also starts at the leaf tip and moves down toward the base of the leaf, but you can tell it is a fungal problem by the tiny spores in the necrotic tissue. The necrotic tissue from calcium deficiency slowly continues to blacken. It is unsightly but not fatal to the plant

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2. This plant is growing vigorously, except for the two new growths with the necrotic tissue.

Plants in my greenhouse receive plenty of calcium in their diet. Between the Cal Mag fertilizer and calcium nitrate supplements, they feast on about 60 ppm nitrogen, 40 ppm calcium and 20 ppm magnesium each time they are watered during the growing season. So, can they really have a calcium deficiency? Once you accept the fact that they are exhibiting signs of calcium deficiency despite the fertilizer regimen, it is time to explore whether there is some cultural issue contributing to the problem.

Was it the hot summer temperatures causing the problem? Poole and Sheehan postulated that the black tips are from a possible calcium deficiency brought about by failure of the roots in pots that are too warm to absorb calcium in the necessary amount. They suggest increasing the frequency of watering to keep the medium cool. This summer the under bench misting system did a great job keeping temperatures from getting much over 98F, so temps probably weren't the issue.



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3. *These are healthy plants, except for the black leaf tips on the newest leaves of plants that were repotted earlier in the year and had not reestablished their root systems sufficiently when the new growths formed.*

There were only 5 or 6 plants in the whole greenhouse with this problem. The black leaf tips weren't restricted to one type of cattleya, like the fast-growing Central American cattleyas now called Guarianthe. The problem affected different types of cattleyas with no obvious connection to one another. The aha! moment came after checking the plant tags and discovering that each of the affected plants had been repotted earlier that spring. Another mystery solved!

Despite your best efforts to supply sufficient calcium, your plants can still suffer from deficiency if something interferes with the uptake of this critical element. Calcium is mostly absorbed through roots, so a compromised root system can easily manifest itself in signs of calcium deficiency. Root function can be disrupted for many reasons, most obviously from the repotting process itself, particularly when orchids are repotted when new roots are not actively forming. Older roots are damaged in the repotting process and the plant must send out new roots to stabilize itself.

To prevent this from happening again next year repot orchids when they are just beginning to grow their new roots. Consider spraying root stimulators on the roots and rhizome to encourage root growth, and perhaps add some root stimulator or seaweed to the irrigation water for the next month or so to encourage root growth.

References and Additional Reading:

Bottom, Sue. 2017. Calcium Deficiency in Cattleyas, accessed online 10/23/20
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Poole, Hugh A. and T.J. Sheehan. 1973. Leaf-tip Die-back of Cattleya — What's the Real Cause?
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