

ABNORMAL PETUNIA AND CALIBRACHOA CROPS

As you all know, petunias and calibrachoa make up a major proportion of spring annuals in North American greenhouses every year. With so many small pots, baskets and patio planters full of these genera in production, they represent a lot of the calls we get in spring.



Calibrachoa and petunias are low pH-loving, moderate- to high feeders, and are more prone to tospoviruses (like tomato spotted wilt virus [TSWV]) and tobamoviruses (such as tobacco mosaic virus [TMV]) than many other spring annuals. As such, when growers see discoloration or signs of abnormal growth, red flags go up quickly. Since early symptoms of pH-related issues, too-low feed, and viral disease can look like one another, work quickly to gain insights into the root of the problem and implement the proper management steps ASAP, before things get worse.

Here are a few things to look for so you can rule out potential causes of abnormal growth.

Monitor and Manage Soil pH

If your calibrachoa and petunias are starting to get a bit chlorotic, a quick [pour thru, 2:1 test, or saturated media extract \(SME\)](#) can determine whether your growing media pH is in the correct range.

- The ideal soil pH range for these crops is 5.4 to 5.8. While they can both tolerate slightly higher pH levels, exceeding 5.8 can predispose both crops to Thielaviopsis infection. Target a soil pH below 5.8 to reduce risk of disease.
- When soil pH is much above about 6.0, iron (Fe) uptake will be limited, and interveinal chlorosis will start to appear on the newer growth. If uncorrected, chlorosis will increase

in severity and stunting will occur. In extreme cases, tip abortion will occur, and plant growth can completely stall out.

- If you do not have a soil pH/EC meter, but you have been growing everything with the same fertilizer and water source, take a look at your high-pH-loving crops like geraniums, marigolds and pentas. If these crops look great and your calis or petunias are suffering, chances are your soil pH is too high.
- If high soil pH is the cause of chlorosis (iron deficiency) in your calibrachos and petunias, switch to a more-acidic fertilizer formulation temporarily until normal growth resumes. Here are some additional considerations if high soil pH is the culprit:
- If your water source has low alkalinity, fertilizers like 20-10-20 or 21-5-20 are often enough to keep soil pH from creeping up above the optimal range.
- Moderate to high water alkalinity typically causes soil pH to increase significantly over time, and acid injection is often needed to reduce alkalinity to a level that it can be managed by changing fertilizer formulations.
- If you have high water alkalinity but acid injection is not feasible, monitor your soil pH regularly and rotate a highly acidic fertilizer like 21-7-7 into your feed program to lower pH when needed.

Drenching with iron chelate is an alternative treatment option for chlorosis due to high-pH-induced Fe deficiency. However, this is more of a Band-Aid for the problem rather than a long-term solution. This may be viable for shorter-term crops, but large hanging baskets or combo planters will likely need multiple iron chelate drenches throughout the crop cycle if your soil pH and/or water alkalinity is consistently high.

Monitor and Manage Soil Electrical Conductivity (EC)

If soil pH is in the proper range for calis and petunias but plants are still a bit chlorotic, chances are your crops are hungry. Checking substrate EC while you are testing pH is the most reliable way to know if you have been feeding enough. Most handheld meters used for testing media pH can also measure EC with the push of a button, so be sure to check both parameters whenever you test.

For example, if pH is normal but plants are chlorotic and substrate EC is below 0.4 mS/cm (based on a pour-thru), this is good supporting evidence that plants are underfed.

If you are not sure what is an appropriate EC range for your calibrachoa or petunias, most culture sheets from breeding companies provide this info for different series.

Note: different testing methods (pour thru, 2:1, SME) have [slightly different value ranges for low, moderate, and high fertilizer levels](#).

If your substrate EC is too low, increase your feed rate to 150 to 200% of normal for the next 1 to 2 fertilizer applications and re-test the media EC level. As long as nutrient deficiency symptoms were not too severe, plants should start to resume normal growth within the first couple of fertilizer applications.

Check for Viral Disease

Soil pH and EC are often the quickest and easiest parameters to check first when chlorosis or odd growth symptoms start to appear. However, if both are within normal ranges and you can rule out other abiotic factors like chilling injury or micronutrient toxicity (like boron toxicity, which often presents as stunting, thickening of leaves, increased trichome prominence, and yellowing along the leaf margin), virus testing should be your next step.

If you have a notable thrips population in your greenhouse, tospoviruses like TSWV are a definite possibility. Yellow streaking in foliage is a typical early indicator of TSWV in petunias and calibrachoa. Ringspots or necrotic spots often begin developing shortly after streaking starts, especially if crops are subjected to different stress factors like drought or temperature extremes. In-house tests can be done using [Agdia ImmunoStrips](#) or you can send samples to a plant disease diagnostic lab if symptoms appear and you have eliminated other possible abiotic factors. If plants test positive, rogue out symptomatic plants and treat thrips ASAP to prevent the virus from spreading.

Tobamovirus symptoms (such as TMV) often start as mottling (easily mistakable for nutrient deficiency), vein clearing, and distortion of newer leaves. As disease progresses, symptom severity increases, affected leaves become necrotic, and the entire plant eventually dies. Like for tospoviruses, in-house tests can be performed for tobamoviruses, but lab testing is strongly encouraged as a follow-up to any positive test strip result. Tobamoviruses spread mechanically (plant contact, human handling, contaminated tools/equipment), so exercising good sanitation is critical to prevent spreading these kinds of viruses. Immediately discard plants that test positive for tobamoviruses and scout diligently for new symptoms on nearby crops in the greenhouse.