



Brian E. Whipker<sup>1</sup>



Patrick Veazie<sup>1</sup>

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# Osteospermum: Lower Leaf Olive-Green Spotting

*An early spring osteospermum crop was exhibiting olive-green spotting on the lower leaves and eventual total necrosis. Symptoms were typical of a Type II phosphorus deficiency, and leaf tissue analysis confirmed the diagnosis.*

Osteospermum is a nice cool-season crop that is fairly problem-free. When visiting a grower in early spring, one white flowering cultivar had olive-green spotting and necrosis on the lower leaves (Figs. 1-2). Symptoms progressed further over time, the symptomology began as darker green leaves, then olive-green spotting, and finally leaf necrosis (Fig. 3).



Figure 1. Osteospermum with lower leaf olive-green spotting and necrotic leaves, indicating a phosphorus deficiency. (© Brian Whipker)

These symptoms are typical of a Type II phosphorus (P) deficiency. While lower leaf purpling or red leaves are the

most common symptoms associated with a Type I phosphorus deficiency, plants can exhibit Type II symptomology when grown under warm conditions or the plant is not prone to produce anthocyanins. We have observed Type II symptoms in a number of species, ranging from peppers, chrysanthemums, and calibrachoa.

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<sup>1</sup>NC State University, Dept. of Hort. Science  
[bwhipker@ncsu.edu](mailto:bwhipker@ncsu.edu)

### Leaf Tissue Evaluation

To confirm our diagnosis, we obtained leaf tissue samples from the lower leaves of the white cultivar. In addition, we also sampled the uppermost recently mature leaves (MRML) of the same white cultivar and also the MRML of an adjoining pink osteospermum cultivar.

The white cultivar had half the P concentration in the older leaves (0.17%) as compared with the 0.35% P in the MRML. The pink osteospermum cultivar contained 0.32% P in the MRML, which was comparable to the white cultivar's levels. Phosphorus is a mobile element, and the tissue values support that P was translocated out of the lower leaves into the upper foliage, which led to the development of symptoms. Both the white and pink cultivars were irrigated with the same fertilizer concentration. This implies that the white cultivar was more susceptible to phosphorus problems, possibly due to a higher P demand or increased sensitivity.

### Conclusions

Growing plants with lower phosphorus aids in controlling excessive stem stretch. Going too low or withholding P altogether can quickly escalate into the development of deficiency symptoms. We have observed plants developing P deficiency symptoms in 2 to 3 weeks after P was withheld.



Figure 2. As phosphorus deficiency symptoms advance, leaf necrosis rapidly develops. (© Brian Whipker)



Figure 3. An array of symptoms associated with a phosphorus deficiency in osteospermum. (© Brian Whipker)

Prior MS thesis work at NC State University by Dr. Josh Henry found that an adequate P fertilizer concentration was between 10 to 15 ppm P for most species. So a low P fertilizer strategy can be used, but just remember not to go too low.

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**CONTRIBUTORS**

Dr. Nora Catlin  
Floriculture Specialist  
Cornell Cooperative Extension  
Suffolk County  
[nora.catlin@cornell.edu](mailto:nora.catlin@cornell.edu)

Dr. Chris Currey  
Assistant Professor of Floriculture  
Iowa State University  
[ccurrev@iastate.edu](mailto:ccurrev@iastate.edu)

Dr. Ryan Dickson  
Greenhouse Horticulture and  
Controlled-Environment Agriculture  
University of Arkansas  
[ryand@uark.edu](mailto:ryand@uark.edu)

Dan Gilrein  
Entomology Specialist  
Cornell Cooperative Extension  
Suffolk County  
[dog1@cornell.edu](mailto:dog1@cornell.edu)

Dr. Chieri Kubota  
Controlled Environments Agriculture  
The Ohio State University  
[kubota\\_10@osu.edu](mailto:kubota_10@osu.edu)

Heidi Lindberg  
Floriculture Extension Educator  
Michigan State University  
[wolleage@anr.msu.edu](mailto:wolleage@anr.msu.edu)

Dr. Roberto Lopez  
Floriculture Extension & Research  
Michigan State University  
[rglopez@msu.edu](mailto:rglopez@msu.edu)

Dr. Neil Mattson  
Greenhouse Research & Extension  
Cornell University  
[neil.mattson@cornell.edu](mailto:neil.mattson@cornell.edu)

Dr. W. Garrett Owen  
Sustainable Greenhouse & Nursery  
Systems Extension & Research  
The Ohio State University  
[owen\\_367@osu.edu](mailto:owen_367@osu.edu)

Dr. Rosa E. Raudales  
Greenhouse Extension Specialist  
University of Connecticut  
[rosa.raudales@uconn.edu](mailto:rosa.raudales@uconn.edu)

Dr. Alicia Rihn  
Agricultural & Resource Economics  
University of Tennessee-Knoxville  
[arihn@utk.edu](mailto:arihn@utk.edu)

Dr. Debalina Saha  
Horticulture Weed Science  
Michigan State University  
[sahadeb2@msu.edu](mailto:sahadeb2@msu.edu)

Dr. Beth Scheckelhoff  
Extension Educator - Greenhouse Systems  
The Ohio State University  
[scheckelhoff.11@osu.edu](mailto:scheckelhoff.11@osu.edu)

Dr. Ariana Torres-Bravo  
Horticulture/ Ag. Economics  
Purdue University  
[torres2@purdue.edu](mailto:torres2@purdue.edu)

Dr. Brian Whipker  
Floriculture Extension & Research  
NC State University  
[bwhipker@ncsu.edu](mailto:bwhipker@ncsu.edu)

Dr. Jean Williams-Woodward  
Extension Plant Pathologist  
University of Wyoming  
[jwilwood@uwyo.edu](mailto:jwilwood@uwyo.edu)

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