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Plant Sightings: Highlights of Greenhouse Scouting

One aspect of my job as a Floriculture Extension Specialist is visiting growers. It is always wonderful to get out of the university ivory tower and see what is occurring in greenhouses. I do not do this as much as I desire or should. On these trips there are always amazing discoveries. Many a North Carolina greenhouse grower have come to learn what excites me, is not reciprocated in equal enthusiasm by them. The major discoveries are often highlighted in e-GRO Alerts, but many times the minor ones are not. Therefore the focus of this Alert is to provide a photo essay of observations, both good and not so good, observed during last week's grower visits.

Species: Ornamental Kale

Symptoms/Signs: Bolting occurring on overwintering plants (Fig. 1).

Probable Cause: For plants held over the winter, the vernalization process is achieved with cold temperatures. Once warmer spring weather returns, plants will naturally begin to bolt (flower). This progress towards completion of the kale's life cycle has amazing beauty of pinks, yellows, and greens.

Figure 1. Colorful bolting of ornamental kale after a vernalization period. Photo by: Brian Whipker.



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Species: Pansy

Symptoms/Signs: Scattered plants with distorted growth and white mottling (Fig. 2).

Probable Cause: It has been about 15 years since I have seen these symptoms of Pansy Mottle Syndrome. These plants were grown as hanging baskets and the symptoms were not observed until the baskets were taken down. The causal agent for Pansy Mottle Syndrome is still unknown. Extensive studies in the United Kingdom were unfortunately inconclusive ([Report 1^a](#)) and Dr. Jill England is still investigating it ([Report 2^b](#)).



Figure 2. Leaf whitening and distortion are typical symptoms of Pansy Mottled Syndrome. Photo by: Brian Whipker.

Species: Cannabis

Symptoms/Signs: Leaf curling (Fig. 3).

Probable Cause: Leaf curling was observed on one plant in the greenhouse. This highlights the greater plant-to-plant variation that can be observed with a seed-based crop. Clonal-based (cutting) plants have greater uniformity.



Figure 3. Leaf curling observed on one plant of a seed-based crop. Photo by: Brian Whipker.

^a https://horticulture.ahdb.org.uk/sites/default/files/research_papers/PC%20286%20HDC%20Pansy%20Mottle%20Final%20report.pdf

^b <https://www.homegrownplants.org.uk/bpoa-member-news/pansy-mottle-syndrome/>

Species: Sempervivum

Symptoms/Signs: Both live and castskins of aphids can be observed on this sempervivum plant (Fig. 4).

Probable Cause: Aphid populations explode once warm weather returns. While aphids can be problematic, there is a certain odd beauty when observing aphids moving and feeding on plants.



Figure 4. Heavy aphid infestation on sempervivum. Photo by: Brian Whipker.

Species: Sedum

Symptoms/Signs: Distorted new growth and aphids present (Fig. 5).

Probable Cause: One possible sign of a heavy aphid infestation is distortion of the new leaf growth. This sign is not commonly shown in diagnostic guides, so thought it would be beneficial to highlight it.



Figure 5. Leaf curling observed sedum infested with a high population of aphids. Photo by: Brian Whipker.

Species: Veronica

Symptoms/Signs: Interveinal chlorosis of the new leaves of veronica cuttings being rooted under mist (Fig. 6).

Probable Cause: Other e-GRO Alerts have focused on rooting of cuttings and provide in-depth management strategies. Balancing water needs of cuttings can be challenging, especially when a wide array of species are all on the same bench. Excessive moisture (mist or irrigation) induces anaerobic substrate conditions which inhibits iron uptake by plants, resulting in the expression of iron chlorosis.



Figure 6. Upper leaf interveinal chlorosis occurring on veronica cuttings due to excess mist during propagation. Photo by: Brian Whipker.

Species: Vinca

Symptoms/Signs: Cuttings being rooted were collapsing. Base of cuttings were also rotten (Fig. 7).

Probable Cause: Upon closer observations of the base of the cuttings, black and white fungal structures of myrothecium were present. Additional information is available in an article published by Dr. Tom Creswell of Purdue University's Plant Disease Diagnostic Clinic

<https://ag.purdue.edu/btny/ppdl/Pages/POTW2017/POTW02062017.aspx>



Figure 7. Vinca cuttings collapsing during propagation (top) and close up of myrothecium (bottom). Photo by: Brian Whipker.

Species: Calla Lily

Symptoms/Signs: Red stems (Fig. 8).

Probable Cause: This calla lily cultivar has bright red stem coloration. Sometimes we focus only on the flower, and not on the other attributes of the plant. Plants we work with can be amazing if we take the time to really notice their total beauty.



Figure 8. Interesting red stems of calla lilies. Photo by: Brian Whipker.

Species: Hydrangea

Symptoms/Signs: Leaf spotting, both chlorotic and necrotic, and bumps (Fig. 9).

Probable Cause: This situation was the result of applying a tank mix of Avid and Compass as a foliar spray. The leaf bumps are an uncommon symptom. Symptoms appeared within 2 days of the application. When trying to diagnose a problem, the quick appearance of symptoms usually point to an abiotic problem. As seen in the plant overview photo, the new growth since the initial burn appears normal. This also provides clues that it was a one time event such as spray phytotoxicity.



Figure 9. Phytotoxicity due to a foliar spray application of a tank mix of Avid and Compass. Photo by: Brian Whipker.

Species: Hydrangeas

Symptoms/Signs: Purple leaf development (Fig. 10).

Probable Cause: For hydrangeas being grown cold, purple leaf coloration can occur. This is due to the uptake of phosphorus being inhibited by cold growing temperatures and the corresponding onset of a greater anthocyanin production of the leaves. What is interesting here is the effect of leaf shading. Sunlight enhances the development of anthocyanin pigments. Just as with apples growing on the outside of the tree are redder than the ones grown in the interior, a hydrangea leaf fully exposed to the sunlight turns purple while the shaded portion does not. This can be seen once the top leaf is moved.



Figure 10. Highlighting the effects of sunlight on anthocyanin (red) production on hydrangeas. Photo by: Brian Whipker.

Species: Pansy

Symptoms/Signs: Lower leaves with a purplish-black discoloration (Fig. 11).

Probable Cause: When the substrate pH drifts too low (<5.0), the accumulation of iron and manganese can occur in the lower leaves, leading to leaf spotting. This situation occurred on a crop held over the winter.



Figure 11. Lower leaf purple-black spotting and then yellow leaf symptoms due to low substrate pH on pansies. Photo by: Brian Whipker.

e-GRO Alert

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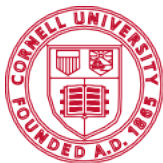
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