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Hydrangea Leaf Distortion: Hydrangea Ringspot Virus confirmed

A recent eGRO alert on “How to Deal with Diagnosis” (<https://www.e-gro.org/pdf/2024-13-18.pdf>), stressed the importance of looking for symptom patterns and getting an accurate diagnosis for a plant problem.

Recently, images of a plant problem were submitted for a possible diagnosis. The affected plants were *Hydrangea macrophylla*. A large number of plants growing within the same production area were affected. Mostly, the new growth showed symptoms of leaf distortion, leaf discoloration, and poor budding and flowering (Figure 1). Older leaves in the images seemed OK. The uniformity in symptom pattern and the number of plants affected tends to suggest an abiotic or possibly an insect cause.



Figure 1. Severe leaf distortion, puckering, and light-colored discoloration of hydrangea leaves. (Image by J. Williams-Woodward)

Initially, thrips feeding damage to developing buds was suspected. Chili thrips have been a problem in some production facilities. The second thought was that a chemical may have been applied that affected the new growth. However, no herbicides, growth regulators, or other chemicals had been applied to the crop. It is extremely difficult to make a diagnosis from submitted images; therefore, a physical sample was submitted for evaluation. When the sample was received, there were no signs of thrips or other insects or mites present on the plants. It was also evident that older leaves were also showing some symptoms, just not as much as the younger leaves.

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Younger hydrangea leaves showed symptoms of light discoloration along the leaf veins (vein clearing), small splotches and light-colored ringspots clustered along the leaf veins and leaf margins (Figures 3 and 4). Slightly older leaves showed more leaf puckering, cupping and distortion (Figure 2). Flower buds were also small and poorly developed. No other fungal or bacterial pathogens were associated with the plant sample.

Vein clearing and ringspots are symptoms characteristic of plant viruses. There are several viruses known to affect hydrangea including Hydrangea Mosaic Virus (HdMV), Hydrangea Ringspot Virus (HdRSV), Tomato Ringspot Virus (ToRSV), Tobacco Ringspot Virus (TRSV), Tomato Spotted Wilt Virus (TSWV), and Alfalfa Mosaic Virus (AMV). Some of these viruses can be detected using antibody serological tests similar to pregnancy and COVID tests, and which can be conducted within most plant diagnostic labs. However, other viruses require more advanced molecular tests that detect the virus RNA and may require sequencing to accurately confirm virus presence.

In this sample, symptomatic hydrangea leaves tested positive for Hydrangea Ringspot Virus (HdRSV). Other virus tests were negative. HdRSV is mechanically transmitted in plant sap on tools. It is not insect (aphid) or seed transmitted. The occurrence of many symptomatic plants within the same production area is most likely due to mechanical transmission through pruning and worker activities. Also, it is possible that propagation of infected plants via stem cuttings could spread the virus into and through production areas. There is no cure for a virus disease. The best control is to discard infected plants, propagate from and/or buy clean stock, and sanitize pruning tools to reduce virus spread.



Figure 2. Hydrangea leaves are cupped, distorted, puckered, and show light ringspot symptoms (lower left in image). (Image by J. Williams-Woodward)



Figure 3. Hydrangea leaf showing symptoms of vein clearing (lightening along the veins) and light-colored ringspots especially along veins and leaf margins. (Image by J. Williams-Woodward)



Figure 4. Vein clearing, blotchy spotting, and small ringspot symptoms present on young *Hydrangea macrophylla* leaves. (Image by J. Williams-Woodward)

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