

Dahlia Mosaic Virus

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Fig. 1. Healthy leaf on left, DMV infected leaf on the right (Note the varying shades of green on the infected leaf that



create the mosaic pattern.)

Fig. 2. Color breaking on infected dahlia flower. Note lighter stripes on some petals

Quick Facts

- Dahlia is an important commercial cut flower product in Utah with up to \$380,000 per acre in gross income depending on variety
- Dahlia mosaic virus (DMV) is one of the most prevalent viruses impacting dahlias
- There are three strains of Dahlia mosaic virus: DMV-Holland, DMV-D10, and DMV Portland
- DMV causes a variety of symptoms that range from mosaic patterns on leaves to chlorosis and stunting

Dahlias are economically important crops in the cut flower industry, which is growing rapidly in US Mountain West. Dahlia stems can be sold at \$4 to \$5 each on wholesale markets, as locally produced dahlias are particularly sought after by florists due to their higher quality and longer vase life than imports. There are many different varieties of dahlias, and they can all be impacted by Dahlia Mosaic Virus (DMV), a widespread viral disease. DMV is causing significant losses in quality and yield of dahlias.

Symptoms

A main symptom of DMV is mosaic patterns (light and dark green patches) on leaves (Fig. 1). Infected plants can exhibit color breaking on flowers (Fig. 2), stunting, and reduced vigor. There are also cases in which plants are asymptomatic and infection is undetected. The variation in symptoms may come from mixed infections with the three strains of DMV: DMV-Portland (now: DMV), DMV-Holland (new name: Dahlia common mosaic virus), and DMV-D10 (new name: DvEPRS). Research is ongoing to determine which factors influence symptom expression.

Disease Cycle

The most likely path of introduction of DMV strains into farms is via infected tubers or cuttings. When tubers are infected, the shoots from these tubers will be infected as well. A virus infected plant will not grow out of the infection. Regardless of the size of the plant or its age, all new leaves and newly formed tubers will be infected as well. Within the farm, aphids, small sap-sucking insects, feed on infected plants, acquire the virus, and transmit it to healthy plants. A dahlia plant can be infected with one to all three of the virus strains simultaneously. In Utah, the most prevalent strain is DMV-D10, which can also be seedborne (Pahalawatta et al. 2007).

Management

There are no resistant dahlia varieties and plants cannot be cured once infected. However, there are management actions that can be taken to reduce DMV in dahlias. Buy certified virus-free seed and tubers to reduce virus incidence. If tubers are infected, do not propagate them, as this will lead to more infected plant material. Destroy symptomatic plants to prevent virus spread by aphids to healthy plants. Aphid control with insecticides is generally ineffective because aphids are mobile and infect many plants before succumbing to the treatment. When cutting flowers, sanitize tools with disinfectant wipes or 70% ethanol before and in between uses to prevent mechanical transmission of DMV. Submit symptomatic plants to a diagnostic lab for testing to determine virus presence. Also, test asymptomatic plants if they will be used for propagation. Samples can be sent to the Utah Plant Pest Diagnostic Lab (<https://extension.usu.edu/pests/upddl/>).

References and Further Reading

- Pahalawatta, V., Druffel, K., and Pappu, H. R. 2007. Seed transmission of Dahlia mosaic virus in Dahlia pinnata. Plant Dis. 91:88-91. <https://apsjournals.apsnet.org/doi/pdf/10.1094/PD-91-0088>

Image Credits

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