



## *Dahlia Mosaic Virus: A Pictorial Guide to Symptoms and Diagnosis*

Prepared by

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Over a dozen viruses are known to infect dahlia. *Dahlia mosaic virus* (DMV) appears to be highly prevalent in dahlias grown in the US. This pictorial guide includes some of the symptoms produced by DMV. Symptoms vary widely from mild mosaic to severe infections that result in yellowing and stunting of the newly emerging foliage or the entire plant. Other symptoms include chlorotic spots, veinal chlorosis, vein clearing, leaf malformation and systemic chlorosis. The accompanying article in this issue (Bulletin of the American Dahlia Society, Fourth Quarter, December 2004) has additional details.



Additional information is available at <http://dahlia.wsu.edu>

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## **A Pictorial Guide to Symptoms Produced by *Dahlia mosaic virus***

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Viruses continue to be a concern for dahlia growers. Removal of virus-infected plants and by avoiding propagation of infected plants can be very effective in reducing their impact in the long run. The first step in dealing with viral diseases is to be able to identify plants infected with viruses. Viruses tend to produce characteristic symptoms in the plants they infect. This is the result of dramatic changes in the physiology of the infected plants. These physiological changes manifest into what we see 'abnormal' looking plants. While symptoms produced by virus infection can be used as a tool for diagnosis, often times the same type of symptoms could be caused by other pathogenic organisms such as fungi and bacteria. Knowing what is making your plants sick can make a huge difference in how to control it or make your plants get better. In the case of viral infections, diagnosis based on symptoms alone could lead to confusion since one virus can produce a wide range of symptoms and conversely, different viruses can cause same type of symptom. Most often symptoms can be used to make a call whether the causal agent is a virus (as opposed to a fungus or a bacterium), frequently, symptoms alone may not be sufficient to identify which particular virus is involved. Remember, there are more than a dozen different viruses that are known to infect dahlias! For this reason, infected plants are usually tested in the laboratory to confirm the identity of the virus.

In our recent surveys of dahlias across the country, we found that *Dahlia mosaic virus* (DMV) appeared to be widespread. As a result, we are focusing our efforts on this virus: researching on developing better methods to detect it and how to eliminate the virus infection. Besides research activities, I am developing a series of informational and educational tools to help ADS members identify DMV infections in their gardens. Fortunately, DMV produces some symptoms that are characteristic to this virus. This issue of ADS Bulletin comes with a poster that contains a pictorial guide depicting various symptoms produced by DMV. In this article, I describe some of the different symptoms produced by DMV in dahlias.

### Effect of DMV on dahlia

In general, virus infections tend to have the greatest negative impact if the plants are infected early in their life. Just like us humans, younger plants tend to be more susceptible to environmental factors and pathogens and they tend to develop some tolerance as they grow older (just like infants and toddlers tend to catch infections more often and more readily than adults). So it is important that we keep our dahlia plants with good vigor during the early stages. Also, environmental factors such as temperature plays a very important role in symptom expression. Viruses in general tend to be sensitive to temperature and depending on the temperature, symptoms can be masked. Under right conditions, if the plant gets infected early, the effect will be more devastating. This scenario usually results in severe stunting of the plant with very few blooms. Infection during later stages or symptom expression when plants are older may lead to a wide range of symptoms in DMV infected dahlias. Below is a list of symptoms that are commonly associated with DMV infection. A pictorial guide is provided as in insert with this Bulletin.

Mosaic: The most common type of symptom is mosaic. Mosaic typically is described as alternating dark and light green islands on leaves. Virus infection typically produces an imbalance in the chlorophyll synthesis in the infected plant as a result we see this alterations in the green color on the leaves.

Veinal chlorosis on leaves: Besides mosaic, another commonly found symptom is yellowing along the veins on leaves. This yellowing may eventually spread to the entire leaf. In case of severe infection, most of the leaves on the plant may turn yellow which is referred to as systemic chlorosis.

Chlorotic spots: This is another common symptom on dahlia. Leaves of infected plants develop yellowish spots distributed randomly across the leaf (as opposed to yellowing along the veins as described above). These spots may eventually join and the entire leaf may turn yellowish in color.

Stunting: This could be due to many reasons so this symptom alone is not a reliable indicator of virus infection, let alone infection by DMV. However, severe infection by DMV can result in reduced vigor, poor growth and overall stunting of the plant. This stunting becomes more apparent especially when adjacent plants are showing normal growth pattern.

Malformation of young shoots: While older leaves and shoots may appear normal, some time, newly emerging leaves show various degrees of stunting or deformation.

The accompanying poster has images of dahlia plants with some of the above described symptoms. ADS members are encouraged to review the images and be on the look out for virus-infected plants in your garden.

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