

**Cucumber Mosaic Virus** – Are some of your vegetable plants deformed, twisted or elongated? Are the leaves mottled, wrinkled or curled? Are the plants stunted and not producing any fruit? If you answered yes to any of these questions, then your plants may be suffering from Cucumber Mosaic Virus (CMV). This is a common virus, worldwide, and is present every year in New Mexico, but it usually occurs sporadically and is not usually widespread across the state.

**Symptoms** – CMV can cause a wide range of symptoms depending on host, age of the plant, virus strain and environmental conditions. The disease is sometimes referred to as “shoestringing” because of the effect on young leaves to develop a narrow, elongated, tendril-like appearance (Fig 1 and 2). Although common, this symptom is not always associated with infection. Other common symptoms include deformity, wrinkling, twisting, curling, yellowing (chlorosis), and mosaic or mottling (Fig. 3 and 4).



Figure 1. Chile pepper infected with CMV.



Figure 2. Tomato infected with CMV (not the narrow, tendril-like, young tissue).



Figure 3. Chlorosis, mosaic and deformity associated with CMV infection of a young greenhouse grown tomato.



Figure 4. Cupping and deformity associated with CMV infection in eggplant.

Unfortunately, CMV doesn't produce unique symptoms and diagnosis based solely on visual observations is risky. Many other viruses produce similar symptoms. Likewise, some herbicides may cause look-a-like damage (Fig. 5 and 6). Whether or not there has been an herbicide application on or near affected plants, an important consideration in distinguishing between a virus disease. The number of plants affected may also be a clue to the cause. Typically, a virus will affect a relatively small number of plants whereas herbicide injury may be more wide-spread. A laboratory test can confirm infection by CMV and/or other plant viruses. Contact the NMSU-PDC (<http://aces.nmsu.edu/ces/plantclinic/>) for more information.



Figure 5. Herbicide injury on tomato seedling.



Figure 6. Herbicide injury on pepper seedling.

**Host Range** – CMV has a wide host range and has been recorded to cause disease in over 1200 species in over 100 families of monocots and dicots, including many vegetables, ornamentals, and woody or semi-woody plants. Some of the most common hosts are tomatoes, peppers, cucurbits (including squash, melons, cucumbers, and pumpkins), beans, eggplant, lettuce, spinach, alfalfa (Fig. 7), many ornamentals, and many weeds. In some cases, infected alfalfa may not exhibit symptoms and, as such, the infection goes undetected. In New Mexico, infected alfalfa may be an important reservoir for the virus.



Figure 7. CMV infected alfalfa.

**Transmission** - CMV is transmitted by over 80 species of aphids, including the green peach aphid (Fig. 8 and 9), in a non-persistent, stylet-borne manner. Aphids acquire the virus by feeding on infected plants. Acquisition occurs quickly, usually within 60 seconds.

The insect can then transmit the virus by feeding on an uninfected plant for the next few minutes. After a few minutes of feeding, the virus is lost and the insect must again feed on an infected plant to re-acquire the virus.



Figure 8. Green peach aphid (Photo by David Cappaert, Michigan State University).



Figure 9. Winged green peach aphid (Photo by Scott Bauer, USDA-ARS).

The virus is seed-borne in some host species, such as spinach and many legumes, but seed transmission hasn't been shown for all hosts. When a fairly large number of greenhouse plants are infected, infected seed may be to blame. Additionally, the virus can be mechanically transmitted; however it is a fairly unstable virus, therefore it is unlikely to be transmitted by workers handling plants.

**Management** – As with other plant viruses, once a plant is infected, there is no cure. Infected plants should be removed from the greenhouse or garden. Because many weeds serve as alternate hosts for both the virus and the aphids, good weed management is an important aspect of control. Additionally, keeping aphids from feeding on plants can be helpful. The most effective insect prevention treatment has been obtained by caging plants under insect netting – this prevents insects from getting on the plants. Insecticides are generally not effective in reducing virus infection because of the speed at which the virus is transferred from the insect to the plant. Many crop plants have cultivars which are known to be resistant to CMV. These cultivars are good choices in areas where the disease has been a consistent problem.

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