



AVRDC - The World Vegetable Center

Fact Sheet

Tomato Diseases

Cucumber Mosaic Virus (CMV)

Found worldwide

Symptoms

Plants in all growth stages may show symptoms. CMV causes a “shoestring” effect of young leaves with subsequent narrow, tendril-like leaflets. Plants with severe shoestring symptoms are stunted with little or no marketable fruit.

CMV symptoms may be misdiagnosed as tomato mosaic virus (ToMV) infection. ToMV infection produces “fern-like” leaves; both CMV and ToMV produce mosaic symptoms. Shoestring symptoms may also resemble injury caused by the herbicide, 2,4-D; to distinguish



this damage from CMV, 2,4-D symptoms correspond to recent herbicide use and other broadleaf plants in the area will show distorted, curled foliage.

Conditions for Disease Development

More than 80 species of aphids including the green peach aphid, *Myzus persicae*, are an important vector of CMV. The virus has a very wide host range and may infect many monocot and dicot plants including various cucurbits, tomato, pepper, and other crops.

How to Identify Cucumber Mosaic Virus



CMV is transmitted by aphids (inset).
Healthy leaf (left) and infected leaf (right).



Notice shoestring, tendril-like foliage

The large number of aphid vector species and natural host reservoirs accounts for the high incidence of CMV in field plants. Aphid vectors can acquire and transmit the virus after feeding for only one minute, but the ability to transmit it declines quickly. Tomato is not a preferred host of the green peach aphid, which normally colonizes various cucurbits and other plants. Most epidemics occur when the primary virus inoculum exists in reservoirs such as weeds.

CMV is transmitted at low rates in tomato seeds as well as with other crop or weed seeds.

CMV can be mechanically transmitted but because it is not as stable as TMV, workers handling infected tomato plants do not as readily transmit it.

Control

No tomato varieties are resistant to CMV. Current control measures for CMV are focused on prevention. The use of virus-free seeds together with the eradication of virus reservoirs such as volunteer plants and nearby weeds can be effective in controlling the disease.

Grow seedlings under netting with mesh size of 32 or greater to prevent aphids from entering. Discard any young plants that show virus symptoms, being careful not to touch other seedlings while discarding them. Avoid touching or handling plants prior to setting them in the field. Dip hands in milk while handling plants. Do not clip young seedlings since this increases the possibility of mechanical transmission of the virus from contaminated tools or hands.

Remove diseased plants from the field as soon as virus symptoms are noticed. This will reduce the spread of the virus by aphids.

Disinfect tools, stakes, and equipment before moving from diseased areas to healthy areas. Contaminated tools should be washed thoroughly, dipped for 30 minutes in 3% (w/v) trisodium phosphate (TSP), and not rinsed before use. Hands should be washed and scrubbed well with 3% TSP, then rinsed thoroughly with water. Alternatively, hands and tools may be washed with soap or milk. Work in diseased areas last after working in unaffected parts of a field.

Insecticide sprays may not be totally effective because the aphids move to other nearby unsprayed plants when disturbed. If feasible, prevent aphids from reaching the tomato crop by covering the planted area with a 32-mesh nylon net. Other less effective measures include: planting barrier crops such as corn, applying sticky traps, or covering the ground with an aphid deterrent material like aluminum foil strips.

Another control strategy is to grow trap crops nearby that attract aphids and then spray these plants with a contact insecticide to destroy the aphid populations. Also, spray the tomato crop with mineral oil to delay virus spread in the field by interfering with aphid transmission of the virus.

For more information on the production of tomato and other vegetables, go to <www.avrdc.org>.