Florida-Friendly Landscaping Problem Diagnosis Fact Sheet

Cucumber Mosaic Virus (CMV): A Growing Problem for A Popular Native, American Beautyberry (*Callicarpa americana*)

American Beautyberry
*Callicarpa americana*

**Florida-Friendly Features**
In Southwest Florida, a 5-8’ tall, open-growing, native shrub grown for its attractive, shiny, purple berries, wildlife value and low-maintenance care.

**Landscape Use**
* massing 3 or more together to create a picturesque woodland planting
* As a groundcover for full or part sun in non-irrigated landscapes and borders
* Use to accent or naturalize community landscapes with other natives in yard borders and preserves
* Foundation plantings, entrances, road medians and golf courses

Healthy Beautyberry (late June, 2008)

American beautyberry has become a sought-after native for Florida-Friendly landscaping™. It is a fast growing, low maintenance shrub that’s relatively pest-free.

**Cucumber Mosaic Virus (CMV)** is a suspected pathogen affecting American beautyberry, *Callicarpa americana*. An array of visual leaf symptoms and stem dieback are displayed. Damaged shrubs were reported by the authors in Estero, Cape Coral, Ft Myers and Sanibel Island. In November, 2011 samples were sent to the Plant Disease Clinic, Dept. of Plant Pathology, University of Florida/IFAS, Gainesville, FL for analysis. The sample was tested for CMV. The lab confirmed leaf feeding by aphids. Using an *ImmunoStrip* test produced by Agdia, Inc. the sample showed a slight positive for the disease. Seed from plants suspected of CMV were germinated by the agent. Similar symptoms of CMV were displayed on the seedlings including those not showing any aphid feeding. Early leaves on these seedling had no symptoms of the virus until the branches were 1-2 feet long.
Cucumber Mosaic Virus (CMV) in American Beautyberry (Callicarpa americana)

Symptoms:
On new seedlings, CMV symptoms appear on the newest leaves in the late Spring. Symptoms mimicked nutritional deficiencies and herbicide injury.

Seedlings with CMV exhibited milder symptoms; light grey, yellow or lime green virus streaking on leaves with minimal leaf stunting and distortion.

Plants infected with the disease may appear healthy early in the Spring. On established plants, branch elongation, flowering and seed set appeared normal until June when more leaf yellowing, stippling and stunting became pronounced.

Inspecting several seedlings two years after infection, CMV visual symptoms included leaf mosaic mottling, significantly more leaf distortion and in some cases, shorter branches before flowering and fruiting. Plants infected for two or more years also showed poor vigor and stunting. Leaf canopy looked thinner because of smaller, stunted leaves. Plants were noticeably shorter and yellower, growing 4-5 feet tall only instead of 6-7 feet tall.

As the disease progresses, more severe CMV symptoms appear on landscape plants including puckered discolored and deformed leaves. Branch wilting and dieback occurred. Dead and dying branches were black; all its leaves were wilted and brown.

Removal of dead branches by pruning had no effect on slowing the infection. New branches on the same plant continued to die back from the plant base.

In one yard with no virus controls implemented, all eight beautyberry plants became infected after three years of exposure. Pruning infected branches may have contributed to the spread of the disease in the yard. All transplants grown from seed from this yard had CMV symptoms. In many cases, the symptoms took several months to develop fully.
**Why a Problem for SWFL**

Many host plants for CMV exist in the wild. SWFL’s year-round growing season and high average temperatures is a perfect storm for spreading the pathogen in the environment. Landscapers and gardeners can also spread the disease. CMV’s most likely transmitter is by aphids feeding on CMV-infected plant sap from weeds or plants nearby. Host plants for CMV could also be growing nearby in pastureland, vegetable gardens, fruit trees, wildflowers or many common annuals grown as groundcovers and bedding plants.

CMV produces a systemic infection. The disease can affect just parts of the plant like the leaves or stems or symptom will show up on all parts of the plant. The symptoms vary widely from plant to plant or by the length of time the plant has been exposed to the infection.

CMV, like many viruses on plants, is often difficult to identify in the field relying only on visual symptoms. Aphid-transmitted viruses like CMV are most pronounced on plants infected at an early growth stage.

Landscapers and gardeners may inadvertently spread CMV by reusing or moving infected plants. Clean pruning and shearing tools to prevent spreading the disease mechanically to other plants.

Other garden tools needing cleaned if exposed to CMV include: knives, hand weeders, trowels, shovels or pots and propagation tools.

All infected plants, weeds and seeds suspected to be carrying CMV should be destroyed rather than reused for mulch or compost.
**Aphids Transmit CMV**

CMV is known as an extremely damaging disease that has no known cure. Prevention is key when dealing with any virus pathogen.

Aphids are the most likely transmitter for the disease. Aphids are very common insects in Southwest Florida. They are found on trees, shrubs and herbaceous perennial plants.

Aphids are present year-round in Southwest Florida. Aphids are pear-shaped and soft-bodied insects. On ornamental plants, CMV infected aphids can feed repeatedly on plants like beautyberry that are commonly used in Florida-Friendly landscaping™. Other FFL host plants include native and exotics like passion vine, scarlet milkweed, iris, pine, elm, oak, willow and green ash.

Aphids do damage to plants by sucking sap from one plant and transmitting CMV to a healthy ornamental plant like beautyberry.

Prior to the onset of CMV infection, look for aphid feeding sites or stipules along the leaf veins on the undersides of the leaves. Aphids may alternate between different plant hosts in the same area of the yard or infect other plant species nearby. Winged forms of aphids can migrate long distances. They are often present on plants unbeknownst to a gardener. Aphids can infect a plant within seconds. Contaminated plant parts can spread the viruses rapidly via yard equipment or by wildlife.

More than 60 different species of aphids are known carriers of CMV. Six of these species in Florida are suspected to do most of the CMV transmission to highly susceptible vegetable and fruit crops including: peppers, tomatoes, cucurbits and banana. For gardeners, geraniums may be infected with CMV and show no symptoms.
Best Management Practices for CMV Infected Beautyberry and Other Landscape Plants

It is extremely important to prevent the spread of infected plant sap from a suspected beautyberry shrub. Dispose of seeds on affected plants and pull seedlings that display symptoms of CMV.

Cultural Controls

All plants showing symptoms should be removed and destroyed. Weeds in nearby beds and fencerows should be mowed or removed. Perennial weeds known to carry CMV should be eradicated permanently if possible. Keep them out of propagation houses, greenhouses, gardens, landscapes and compost bins.

Controlling aphids on beautyberry plants in home landscapes would be cost prohibitive. Some studies suggest avoiding high aphid populations from susceptible crops by only using slow-release nitrogen (SRN) fertilizer products. Lee County’s fertilizer ordinance restricts fertilizer applications to products containing 50% or more SRN only.

In home landscapes where aphids are present, horticultural oils can be applied to interfere with the transmission of aphid-transmitted viruses like CMV. Soap added to horticultural oil has also enhanced aphid control and reduced transmission of the virus.

Encourage aphid predators and other beneficial insects, parasites and pathogens. Natural enemies of aphids include lady beetles, lacewing larvae, and parasitic wasps. Avoid using neem or broad-spectrum insecticides to avoid harming beneficial insects.

Use only virus-free seed and purchase healthy transplants from reputable nursery growers and garden centers.

Disease Management

There are no chemicals that will cure a plant with CMV or any other virus. Immediate removal of infected plants is the only way to stop spreading it to other plants in your yard.

CMV Prevention

1. Become familiar with key pests and diseases on ornamentals
2. Monitor newly planted beautyberry for signs of CMV
3. Wear disposable gloves or wash hands in warm soapy water.
4. Never propagate from infected plants, even if some parts of the plant appear healthy.
5. Never try to prune off infected branches. Remove the plant instead. Pruning will not eradicate the virus. Pruning tools with infected sap may spread the disease.
6. Dip tools in an anti-microbial solution on a regular basis.
References
Aphids on Shade Trees and Ornamentals, W.S. Cranshaw, Colorado State University, no. 5.551, 2/09 http://www.ext.colostate.edu/pubs/insect/05511.html


Vegetable Pests & Disease, A PowerPoint Presentation created by Gene McAvoy, Hendry & lee County Extension Service, LaBelle, FL

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