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Peony: *Tobacco Rattle Virus*

Light and dark green mosaic (mottled) patterns and ringspots were observed on peony leaves. This Alert will describe a common ringspot virus, Tobacco Rattle Virus (TRV).

Peonies (*Paeonia* sp.) are herbaceous perennials that display large showy flowers with hues of lavender, pink, purple, red, or white. Peonies flower during spring months, leaving only green foliage behind in the landscape or cut flower fields during the summer. However, in some instances, peonies are forced in greenhouses for early or fall cut flowers sales.

On a recent greenhouse visit, a crop of peonies that were being forced for cut flowers was observed. Multiple plants were exhibiting a mosaic or mottled pattern of light and dark green on the leaves (Fig. 1 to 3) and ringspots (Fig. 4). Flower buds also exhibited ringspots (Fig. 5). Uncertain of the virus, a sample of foliage was submitted to Michigan State University's Diagnostic Services Lab for testing. Dr. Jan Byrne, MSU Diagnostic Services, in

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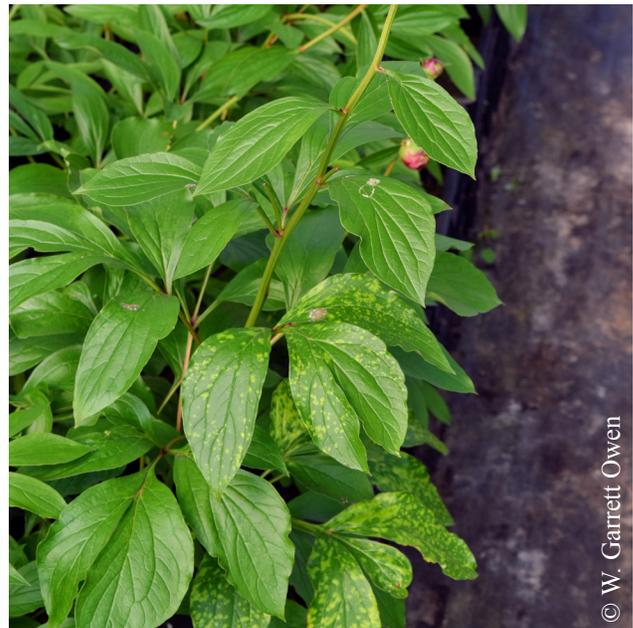


Figure 1. Cut flower peony plants exhibiting a mosaic or mottled pattern of light and dark green on the leaves.

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conjunction with another plant pathology lab group, tested the foliage with a molecular based test (qPCR). Foliage tested positive for Tobacco Rattle Virus (TRV), also known as Peony ringspot virus or Peony mosaic virus.

Tobacco Rattle Virus

TRV has a wide host range of over 400 species, including: anemone, bleeding heart, columbine, astilbe, clematis, delphinium, hosta, iris, peony, petunia, phlox, sunflower, tulip, and many agronomic, vegetable, and weed hosts. Many of the hosts listed above can remain symptomless.



Figure 2. Peony leaf exhibiting mosaic or mottled light and dark green patterns on the leaves.

TRV often stays localized to the roots of infected hosts, but in the case of peony, the symptoms are expressed in the foliage and flowers. This virus is somewhat common in ornamentals; a 2013 survey done by Wisconsin Department of Agriculture, Trade and Consumer Protection detected TRV in 40% of all ornamentals, and 47% of all peony samples tested.



Figure 3. Mosaic pattern caused by Tobacco Rattle Virus (TRV) on leaves of peony.

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Figure 4. Ringspots caused by Tobacco Rattle Virus (TRV) on leaves of peony.

Vectors

The virus is transmitted by nematodes (genera *Paratrichodorus* and *Trichodorus*), also known collectively as stubby root nematodes. The nematodes are highly mobile in the growing substrate and

are favored by abundant moisture content. TRV is also transmitted by vegetative propagation of infected plant material, movement of inoculated substrate, plant residue, or by propagation and harvesting tools.

Management

Early detection of virus infection is critical to prevent major crop loss. Once a plant is infected with TRV there are no treatment options or possible cures. The impact of TRV can vary from little impact to loss of plant vigor and reduction of flowers. Symptomatic plants with reduced vigor should be removed and destroyed.

In an established growing area, remove infected plants once plants have been confirmed with a viral infection to prevent spread to nearby healthy plants. To date, no nematicides are currently listed for stubby-root nematodes, therefore avoid replanting the same area with a susceptible host plant species. In the field, soil fumigation may provide some control of the nematode vector.

Literature Cited

Wisconsin Department of Agriculture, Trade and Consumer Protection. 2014. Viruses of ornamentals report 2013. 5 May 2017. <http://pestsurvey.wi.gov/plantdisease/pdf/ornamentals/Ornamental-Virus-Powerpoint-2013.pdf>



Figure 5. Ringspots caused by Tobacco Rattle Virus (TRV) on flowers of peony.