Pest e-alerts

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An Update on Rose Rosette

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Late last fall and this winter I have received lots of questions regarding rose rosette, its importance, and how to control the disease. There has been considerable confusion about rose rosette. Much of this is related to the fact that little detail is known about the disease among plant pathologists.

Rose rosette was first described as a disease of rose in the 1940s. Rose rosette is widespread in wild rose stands east of the Rocky Mountains. Symptoms include leaflet distortion, bright red leaf pigmentation (Fig. 1), witches'-broom (Fig. 2), and canes that grow slow and are excessively thorny (Fig. 3).

Fig 1. Bright red leaf pigmentation caused by rose rosette disease. (Photo Credit: James Amrine, West Virginia University, www.bugwood.org).

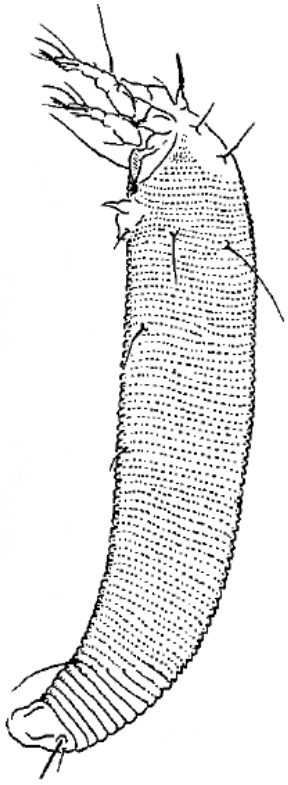
Fig 2. Witches‘ broom caused by rose rosette disease. (Photo Credit: James Amrine, West Virginia University, www.bugwood.org).

Fig 3. Excessive thorniness of rose canes is a symptom of rose rosette disease. (Photo Credit: John Hartman, University of Kentucky, www.bugwood.org).

Cultivated roses are also affected by the disease, which has resulted in increased interest by home gardeners and nursery owners alike. Anecdotal reports suggest that some of the newer improved cultivars might be very susceptible to the disease. There is also concern about being able to test propagation material for the presence of the causal organism to prevent spread in planting stock. This has been difficult, however, because the causal agent has not been absolutely identified and no diagnostic tools developed.

Over the years, the causal agent of rose rosette was thought to be either a phytoplasma or a virus. Phytoplasmas are prokaryotic cells that lack cross walls. Phytoplasmas cannot be grown on artificial media, so research with these organisms is difficult. Most phytoplasmas are transmitted from plant to plant by leafhoppers or psyllids. They are found in sieve elements in the phloem of plants and can cause symptoms like yellowing (chlorosis), twisting, and other abnormal growth habits.

Viruses are much different in that they are not composed of cells. They are very small particles that are made up of nucleic acid (genetic material) and protein. Viruses cannot be grown in artificial media, also making research with these organisms somewhat difficult. Viruses enter cells through wounds or other openings and cause disease by replicating in the cells and spreading to other cells in the plant. As this takes place, plants generally produce less chlorophyll and growth-regulating hormones. Therefore, plants often become stunted or have odd growth habits. Viruses can be transmitted in a number of ways including mechanically through sap, by insects, mites, nematodes, or plant propagation.



Until recently, some evidence suggested that rose rosette was caused by a phytoplasma that was transmitted by an eriophyid mite. The phytoplasma of interest was an aster yellows type from the apple proliferation group. This has caused some debate, however, as phytoplasmas inhabit phloem in plants and only leafhoppers have feeding mouthparts, which can access the phloem elements deep in plant parts. Eriophyid mites do not have phloem-piercing mouthparts. Thus, reexamination of the causal agent of rose rosette and the vector is required before adequate control recommendations can be developed.

Recent research by Laney et al. (2011) has helped to shed some light on this 70-year-old mystery. These scientists from the University of Arkansas and Oregon State University collected rose rosette symptomatic plant material and were able to identify a new virus that is thought to be the causal agent of rose rosette. The new virus is Rose rosette virus (RRV). RRV is a member of the new group called Emaravirus. This group of viruses has two other members Fig mosaic virus (FMV) and European mountain ash ringspot associated virus (EMARaV). Laney et al. (2011) were able to develop a detection technique for RRV and use it to sample symptomatic plant material

successfully. This is a big step forward in that now there is a diagnostic tool available to test plant material for the presence of RRV.

Because rose rosette is likely caused by RRV it also makes sense that the vector could be an eriophyid mite. Virus particles are not limited to the phloem like phytoplasmas; therefore, eriophyid mites may have the ability to transmit RRV, although tests to demonstrate mite transmission of RRV have not been successful.

Roses with symptoms of rose rosette cannot be cured of the disease. The best method for insuring the health of asymptomatic roses is to remove any rose rosette symptomatic plants and destroy them. More information about the disease and the mite vector(s) that might be responsible for transmitting RRV are required before sound recommendations can be made concerning mite control to manage rose rosette.

References:

Agrios, G.N. 1997. Plant Pathology, 4th edition. Academic Press. 635pp.

Horst, R.K. and Cloyd, R.A. 2007. Compendium of rose diseases and pests, 2nd edition. APS Press. 83pp.

Laney, A.G., Keller, K.E., Martin, R.R., and Tzanetakis, I.E. 2011. A discovery 70 years in the making: characterization of rose rosette virus. J. Gen. Virology 92:1727-1732.

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