

Rose Rosette Virus

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Rose rosette virus (RRV) is the viral pathogen that causes rose rosette disease (RRD). This virus affects roses in more than 20 states in the United States and has been reported in India and Germany. Early reports of this disease emerged from Canada and California in the 1940s. It spread to much of the United States on *Rosa multiflora* plants. The disease-resistant multiflora roses were imported into the United States to improve rose rootstocks. They were also planted extensively during the Dust Bowl period in the 1930s to serve as living fences for livestock and to slow the effects of soil erosion.

The first report of the virus affecting cultivated rose species was in the 1970s, but RRV did not become a significant pathogen on commercial roses until the 1990s. The disease was first reported in a few Texas counties in the early and mid-1990s. In 1998, the virus became a major pathogen on roses used in mass plantings in the developing Dallas metroplex area. Since then, efforts to disseminate information about the disease have made people more aware of the disease and the need to remove infected plants. RRV has been confirmed in over 20 counties in Texas (Fig. 1). The spread and range of this disease is still monitored in the United States. Visit <http://roserosette.org> for more information and to report suspects.



Figure 2. Typical rose rosette symptoms. Source: Maddi Shires, Texas A&M AgriLife Extension Service

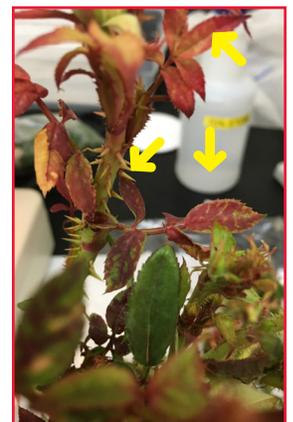


Figure 3. The yellow arrows point to the tie-dyed effect common on roses infected with RRV. Source: Maddi Shires, Texas A&M AgriLife Extension Service

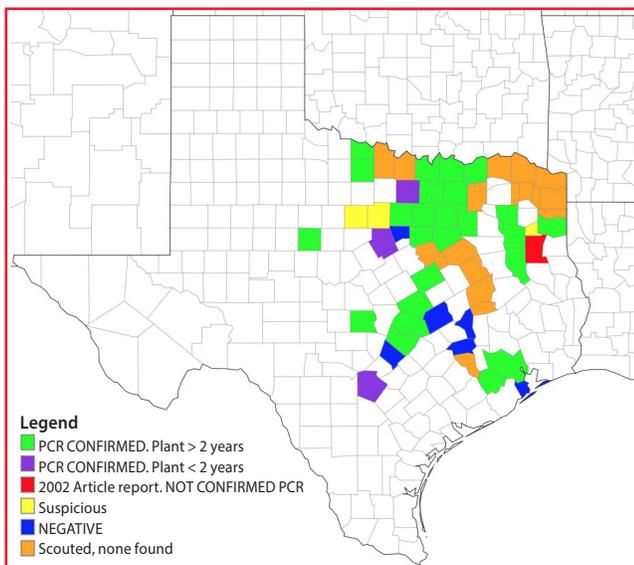


Figure 1. Counties in Texas where RRD has been reported or confirmed. Green and purple counties are positive (confirmed for RRD) counties. For updated disease reports, visit roserosette.org.

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Figure 4. A less common version of RRV infection. There is no redness on the plant, but a long, lateral cane sticks out from the rest of the plant. The cane also has leaf yellowing, witches' broom, and abnormal thorniness. Source: Maddi Shires, Texas A&M AgriLife Extension Service



Figure 5. A rose plant with witches' broom in the blooms, elongated or "strapped" leaves, and unusual redness on the leaves. Source: Maddi Shires, Texas A&M AgriLife Extension Service



Figure 6. This sample has witches' broom, thickened canes, abnormal redness on the leaves, "strapped leaves," and abnormal, rubbery thorns. Source: Maddi Shires, Texas A&M AgriLife Extension Service

Cause and Disease Movement

RRV can replicate (cause infection) only inside of living plant cells. The virus is transmitted by a small eriophyid mite, *Phyllocoptes fructiphilus*. Most readily spread by the wind, the mite can also walk to neighboring plants. It acquires the virus when it feeds on an infected rose plant and transmits the virus when it feeds on noninfected

plants. Disease transmission occurs more often in the summer; however, in warmer parts of the state, transmission can occur year-round. The virus is systemic, meaning it can infect the entire plant. There is no set time for when symptoms appear; it may depend on the cultivar, age, size, and general health of the plant.

Control

There are no known treatments for roses infected with the virus and all rose cultivars appear to be susceptible. Scientists in Texas and across the United States are focusing efforts to identify viral treatments and resistant rootstock. When symptoms of rose rosette disease occur, rule out possible mimics such as nutritional deficiencies and chemical misapplication. To get a confirmed diagnosis, submit symptomatic samples for virus testing to a plant diagnostic laboratory. Early detection and removal of infected roses is the best way to reduce the spread and impact of this disease. When removing the infected plant, bag it before cutting the plant down or quickly place the cut plant material in a trash bag to help isolate and prevent the eriophyid mite vectors from escaping.

Much scientific research about various aspects of rose rosette disease is ongoing, and as new research information becomes available, recommendations may change. For more information about what we know so far about rose rosette disease, see Extension publication EPLP-010 *Rose Rosette Disease Demystified* and visit <http://RoseRosette.org>.

Sources

- Allington, W. B., et al. 1968. "Transmission of Rose Rosette Virus by the Eriophyid Mite *Phyllocoptes fructiphilus*," *Journal of Economic Entomology*. 61: 1137-1140, <https://doi.org/10.1093/jee/61.5.1137>.
- Laney, Alma, et al. 2011. "A Discovery 70 Years in the Making: Characterization of the Rose Rosette Virus." *Journal of General Virology*. 92: 1727-1732, doi:10.1099/vir.0.031146-0.
- Ong, Kevin, et al. 2015. *Rose Rosette Disease Demystified*. Texas A&M AgriLife Extension Service. <http://www.agrilifebookstore.org/Rose-Rosette-Disease-p/eplp-010.htm>.

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