Martin-Gatton
College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-OR-W-16**

Rose Rosette Disease

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Introduction

Rose rosette is a devastating and widespread disease that is a threat to virtually all cultivated roses (*Rosa* spp.) in Kentucky, regardless of cultivar. Even Knock Out® roses, known for their exceptional disease resistance and hardiness, are susceptible to rose rosette disease. Losses can occur in residential and commercial landscapes, nurseries, and botanical garden plantings.

Symptoms

Rose rosette symptoms are initially observed during spring and become more evident as the season progresses. Symptoms can be variable (Figure 1), depending on cultivar, plant age, and growing conditions. Some common symptoms include:

- Rapid elongation of shoots (Figure 2)
- Thickening of newly emerging shoots
- Abnormal red discoloration of shoots and foliage (Figure 3)
- Distorted or dwarfed leaves (Figure 3)
- Witches broom (prolific clustering of small shoots) (Figure 4)
- Spiral pattern of cane growth
- Shortening of internodes (shorter stem length between leaves)
- Overabundance of thorns (Figure 5)
- Atypical flower coloration (e.g., mottling of otherwise solid-colored roses)
- Distorted flowers that may fail to open
- Increased susceptibility to other diseases, such as black spot and powdery mildew
- Lack of winter hardiness

Initial infections progress until all new growth is affected. Flower production continually declines and plants are eventually killed by winter injury or other stressors. Highly susceptible rose varieties may succumb in just one season, or symptoms may continue to increase for several seasons before plant death.

Diagnosis can be difficult in the early phases of disease development when symptoms are mild or may be confused with other problems. For example, distortion and witches broom symptoms may be suggestive of chemical injury from glyphosate (e.g., Round-up) or growth regulator (e.g., 2,4-D) herbicides. However, excessive thorn production is not characteristic of herbicide injury and can differentiate rose rosette from herbicide damage.

Figure 1. Rose bush showing multiple symptoms of rose rosette disease: leaf distortion, witches broom, abnormal red discoloration, and increased shoot elongation.

Newly emerging leaves of some cultivars naturally have a reddish coloration (Figure 6A). While this discoloration disappears as foliage of healthy plants expands, stems and shoots remain red when plants are affected by rose rosette disease; distortion often accompanies the reddening (Figure 6B). Plants exhibiting these or other abnormalities should be closely monitored. Symptom development typically appears 1 to 6 months after initial infection. Unfortunately, often by the time plants exhibit multiple symptoms definitively implicating rose rosette, disease is well-advanced and may have already spread to neighboring roses.

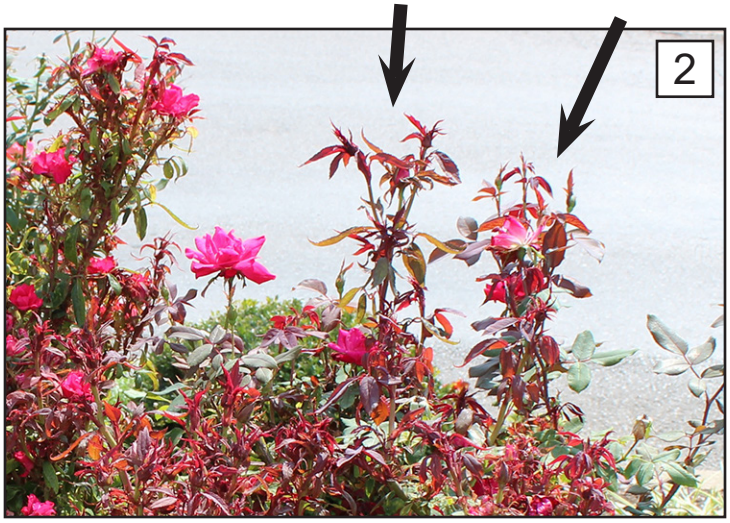

Figure 2. Increased growth and elongated shoots are common symptoms of rose rosette disease (arrows).

Figure 3. Abnormal discoloration and distortion of shoots and leaves can be indicative of rose rosette disease.

Figure 4. Rose rosette disease can cause a proliferation of shoots (witches broom), along with abnormal red discoloration.

Figure 5. An overabundance of thorns is a symptom of rose rosette disease. Note the right-hand cane with normal thorn spacing.

Figure 6. While the new growth of some healthy cultivars is naturally reddish in color **(A)**, this discoloration disappears as leaves continue to expand. In contrast, leaves of roses infected with the rose rosette virus **(B)** often emerge distorted and remain red even as growth continues. Also see Figure 3.

Cause and Disease Development

Pathogen

Rose rosette disease is caused by a virus, which has been named rose rosette virus (RRV). RRV is transmitted by an eriophyid mite (discussed below) and through grafts. Once introduced into a plant, the virus becomes systemic. The virus is not soil-borne; however, it can persist in live roots that remain in the soil from previously infected roses. A diagnostic assay is available, but most diagnostic laboratories use a combination of symptoms and site history to make a diagnosis.

Vector

Rose rosette virus is spread by *Phyllacoptes fructiphylus,* an eriophyid mite known as the rose leaf curl mite. These tiny mites are only visible with the aid of a microscope. Eriophyid mites cannot fly, but they are able to crawl to adjacent plants if leaves or canes touch one another. They are small enough to move from plant to plant via air currents or by attaching themselves to insects. Adult mites overwinter in buds, spent flowers, and leaf axils, and then migrate to developing shoots in spring where they lay their eggs.

Pathogen source

Multiflora roses (*Rosa multiflora*), originally introduced from Japan as a conservation plant and "living fence," is highly susceptible to RRV. This wild rose, which is now considered an invasive/noxious weed, is the primary host and an important source of the virus. However, other wild roses, such sweet briar rose *(Rosa rubiginosa),* can also serve as sources of the virus. Cultivated roses growing near wild roses have a higher risk of infection.

Disease Management

Growers should take precautions to reduce the risk of introduction of RRV. There is no cure for rose rosette disease once plants become infected, thus, early detection and prevention are essential.

Preventative steps

- Select tolerant rose species/cultivars for plantings. Species within the *Rosa* genus have varying levels of rose rosette resistance. For example, *R. arkansana* and *R. carolina* have recently been identified as among the most tolerant species.
- Purchase new roses from a reliable source since rose rosette can be found in nursery stock. Inspect plants before purchase. If symptoms are present, avoid purchasing roses from that supplier.
- Remove wild roses from within 100 yards of cultivated roses whenever possible. When removal is not possible, avoid planting cultivated roses downwind.
- Avoid using leaf blowers near roses to reduce mite spread.
- Horticultural oil applications can aid in suppression of eriophyid mite populations. However, reliance on horticultural oils and miticides to control the mite vector is not considered practical, especially in the absence of good cultural practices, such as removing diseased plants. Also, keep in mind that most miticides labeled for spider mites are not effective against eriophyid mites.

Once the disease is detected

- Remove infected plants completely, including all roots and debris. Diseased plants should be immediately bagged and removed from the vicinity so that the pathogen is not spread to healthy plants. Alternatively, where permitted, infected plants may be destroyed by burning. Do not compost infected plants.
- Take care when digging out roots of diseased plants to avoid scattering disease-carrying mites to nearby roses.
- Remove and destroy any regrowth that occurs from roots remaining in the soil after rose rosette-infected plants are removed.

Additional Resources

Additional information can be found on the UK Plant Pathology Extension Publications webpage
https://plantpathology.ca.uky.edu/extension/publications

- Black Spot of Rose (PPFS-OR-W-10)
- Powdery Mildew (PPFS-GEN-02)
- Roses (ID-118)

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Editor: Cheryl Kaiser, University of Kentucky
Photos: University of Kentucky—Henry Smith (1 & 2), Nicole Gauthier (4 & 5); Bugwood.org—Jennifer Olson, Oklahoma State University (3, 6A & 6B)