

## Plant Clinic Fact Sheet: **Rose Rosette Virus (RRV)**

Rose rosette disease was first described in the early 1940s in North America. In the seven decades since the initial description of the disease, rose rosette has become established across the Midwest and is now common across most of the United States. However, it wasn't until 2011 that the causal agent of the disease, a virus, was isolated and identified.

### HOSTS

In 2011 a virus named Rose Rosette Virus, or RRV, was established as the cause of rose rosette disease. Roses appear to be the only hosts for this pathogen. Unfortunately, a wide variety of rose groups including hybrid tea, floribunda, grandiflora, and miniature roses appear to be susceptible. Shrub roses, including the increasingly popular Radrazz roses (better known by their registered trademark name, the Knock Out® Rose), are also susceptible. The invasive weed, multiflora rose, is particularly susceptible to RRV. This disease has been used as a biological control of multiflora rose with varying success.



**Figure 1** Symptoms of rose rosette on a rose host infected with RRV. Note the thick, succulent stems, the proliferation of small thorns, and the red color of the new growth.



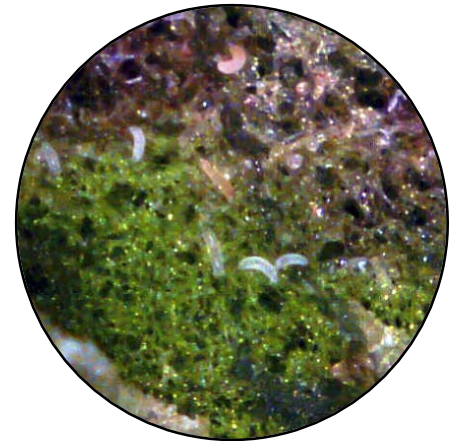
**Figure 2** Symptoms on a Radrazz rose. Note the red discoloration of the new growth and the terminal witches' broom.

### SYMPTOMS

The symptoms of rose rosette can be striking. Flower petals, flower buds, and new leaves are distorted, usually elongated and twisted. Multiple small shoots develop in a cluster, forming a growth known as a witches' broom. New growth is an abnormal red color, and numerous small thorns proliferate. Shoots elongate quickly, giving the new stems a thick, succulent appearance. Unfortunately, many of these telltale symptoms of infection are difficult to distinguish on Radrazz roses as they typically grow quickly and their new growth usually has a red hue. Not all symptoms may be present in an infected host. Symptoms can also vary depending on the variety, age, and condition of the rose host and environmental conditions.

## **PATHOGEN**

Rose rosette is caused by the Rose Rosette Virus (RRV). The virus is transmitted from plant to plant in the environment via the eriophyid mite *Phyllocoptes fructiphilus*. Eriophyid mites are tiny creatures, measuring approximately 0.01 inches in length. They are invisible to the naked eye and require a hand lens of at least 20x strength to be observed. These mites are microscopic in size, and are easily blown by wind currents. The mites congregate and feed on tender new growth, such as buds and emerging leaves. As they feed, the mites acquire the virus from infected plants, then transmit the virus to healthy ones. How long the rose survives after it is infected is heavily dependent on a number of other factors, including general health of the host before infection. Most roses develop symptoms within 3 months and die within 2 years of being infected. Research indicates that the virus also reduces the cold hardiness of the rose host.



**Figure 3** Eriophyid mites on plant tissue. Individual mites measure approximately 0.01 inches in length and are found on tender plant tissue.

## **DISEASE MANAGEMENT**

No chemicals have been shown to be effective at either preventing or curing rose rosette. Once the virus has gained entry to the host, it becomes systemic and spreads throughout the entire rose plant. Because of this, the entire plant should be removed once it is infected, including the root ball. The virus has been found to persist in root fragments left in the soil; however, research indicates that the virus cannot survive in the soil alone. Plants other than roses can be planted into areas affected by rose rosette immediately while roses should not be replanted until all root fragments are removed or decomposed.

### **The following cultural management techniques to reduce the spread of the virus are recommended:**

1. Plant and propagate only virus-free plants.
2. When planting roses in a landscape, leave enough room between the plants that they will not touch even when fully mature.
3. Sanitize pruners between plants.
4. Remove multiflora and other unwanted rose plants that can act as hosts to the virus.

### **If a plant is suspected of being infected with RRV, the following techniques are recommended:**

1. Remove the symptomatic plant as soon as possible (above-ground tissue and roots).
2. Wrap the plant in a plastic bag before removal to reduce the spread of the mite vector.
3. Wrap the infected material in a black plastic garbage bag and leave in the sun for several days to kill the plant tissue and any mite vectors that may be present.
4. Dispose of the infected plant material by burning, where allowed, or remove it from the landscape. Do not compost this material.
5. If the roots are not completely removed, they may send up new shoots. These shoots should be immediately destroyed.

## **NOTE**

Other factors, including herbicide damage and environmental issues, can cause similar symptoms on roses.