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Rose Rosette Disease in Alabama

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Rose Rosette Disease (RRD) is spreading through the wild (Cherokee) roses and cultivated roses across the Midwest, eastern, and now into the southern United States. The disease is now established in northern Alabama and has spread as far south as Birmingham. RRD is affecting the production of container-grown roses and greatly concerns public garden managers and home gardeners because it is lethal to ornamental roses. Until recently, RRD was caused by an unknown biotic agent but this disease is now attributed to the virus - Rose rosette virus.

Symptoms

Symptoms of rose rosette disease depend on the species or cultivar affected, plant age, and growth stage. Symptom variability can complicate disease diagnosis because of some similarities to symptoms associated with injury caused by glyphosate or phenoxy herbicides (i.e. 2,4D, MCPP). Some of the characteristic symptoms include a rapid elongation of new shoots followed by development of witches’ broom or clustering of small branches (Figure 1A). Leaves in the witches’ broom are small, distorted, and may have a red pigmentation (Figure 1B and 1C; Figure 2A). Canes can become thickened and more succulent than those on unaffected parts of the plant (Figure 1D). These thickened stems develop an excessive amount of unusually pliable red or green thorns. Flowering is reduced and may be distorted with fewer petals than normal and flower color may be abnormal. Infected rose plants typically decline (Figure 2B) and eventually die within a couple of years of the first appearance of symptoms.

The new leaves of many rose cultivars normally have red pigmentation, but the red color does not fade on RRD infected plants (Figure 1B and 1C). The red coloration of the new growth on healthy plants usually disappears as the leaves mature. By the time symptoms are recognized, the disease may have spread to neighboring healthy plants.
Other symptoms of RRD that may occur on certain cultivars include dieback (Figure 2B), shortened internodes, blind shoots (shoots that do not produce flowers), rugose leaves, and increased sensitivity to frost. RRD infected plants may also have an increased susceptibility to powdery mildew.

Witches’ broom symptoms are not diagnostic for RRD. This symptom pattern can also occur in response to herbicide injury. If glyphosate (Roundup) contacts the green tissue of a rose plant, it will be translocated to the buds and cause a witches’ broom with yellow or otherwise discolored (Figure 2C), elongated (Figure 2D), and small (Figure 2E) leaves. If this damage occurs in the fall, these symptoms will not become evident until the following spring. The broadleaf herbicide 2,4-D can also cause leaf...
distortion symptoms on roses similar to glyphosate. If the plant is not killed, symptoms of glyphosate herbicide injury will often reappear the following year.

**Distribution and Diagnosis**

Scattered reports of RRD have come from the western United States including Wyoming, Utah, and California. In the Midwest, RDD appeared in Iowa and Nebraska; and has spread as far north as Madison, Wisconsin. This disease has become established in the eastern US, where it has been found north to New York City, east to South Carolina, south to Birmingham, Alabama, and west to Fort Worth, Texas.

Figure 3. Suspected and confirmed distribution of rose rosette (RDD) in Alabama.

When all of the symptoms are present, diagnosis is straight forward. However, the diagnostic characteristic of RRD is the excessive growth of thorns. Diagnosis is difficult because a diseased plant may only exhibit one or a few of these symptoms. Recent molecular techniques have been described to detect Rose rosette virus in plants without characteristic symptoms.
Disease Spread

Rose rosette disease is transmitted by the eriophyid mite *Phyllocoptes fructiphylus*, grafting, and possibly root-to-root transmission. The wild multiflora rose *Rosa multiflora* is a common source of inoculum. The eriophyid mite is microscopic (155-170 X 50 microns). It travels on wind currents from infected to healthy plants, so cultivated roses planted downwind of infected multiflora roses are especially at risk of infection. The eriophyid mite alone causes little damage while feeding, but if it is a carrier of rose rosette virus, symptoms may appear after four weeks to three months.

Control

Rose rosette virus (RRV) is systemic within an infected rose plant and grafting asymptomatic stems onto healthy rose plants will transmit the virus. Pruning shears, knives, and other cutting tools used on diseased plants must be disinfested with isopropyl alcohol or antiviral disinfectant before being used on uninfected plants to prevent spread of the virus. Rose rosette virus is not a soil-borne pathogen. However, it is important to remove infected plants thoroughly because the pathogen may persist in old root pieces that remain in the soil. If plants regrow from these root pieces, as multiflora roses tend to do, they can serve as an inoculum source for nearby healthy plants.

No effective controls are available for rose rosette infected roses, but the disease may be avoided using cultural control methods. No rose cultivars are proven to be RRV resistant. The multiflora (Cherokee) rose appears to be the most susceptible and the native rose species *Rosa setigera* appears to be the most resistant to RRD. Recent experience has shown that Knock Out series and Drift series roses are highly susceptible to RDD. Antique roses, particularly those derived from native rose species, are likely to be quite susceptible to RDD. The reaction of cultivars of hybrid tea, grandiflora, English tea, Austin, Rugosa, and similar roses to RDD has not been assessed but all are assumed to be hosts of the rose rosette virus.

For Alabama nursery producers and home gardeners, early detection of the disease will be the key to effective control. Any suspect roses should be sent to the Auburn University or Birmingham Plant Diagnostic Lab for diagnosis. Remaining plants should be monitored for symptom onset and destroyed (burned) should symptoms appear. Uprooted diseased plants can serve as a source of the virus. In areas where the disease has been highly invasive into nursery stock, managers are advised to cease production of susceptible rose lines.

Multiflora roses should be eliminated from the vicinity of nurseries and gardens. Sites where multiflora roses have been removed should be monitored for regrowth. If multiflora roses cannot be removed, to prevent infection avoid planting cultivated roses on hilltops or downwind of
known infestations of multiflora rose.

There are no chemical controls for rose rosette virus. Control of the eriophyid mite with miticides may reduce the risk of spread. Some reports have documented control of the eriophyid mite with Sevin. It can be difficult to get complete coverage with Sevin; and repeated applications of this insecticide can flare outbreaks of spider mites. Refer to the Alabama Pest Management Handbook ANR-500 for a list of available miticides.

Sources

