



Rose Rosette Disease

Rose Rosette Disease (RRD) is caused by a virus that is vectored by Eriophyoid mites. These mites are very small, about ¼ the size of spider mites, and cannot be seen with the naked eye. The disease causes distorted growth, both of shoots and flowers, and can be fatal within 2-3 years. RRD is specific to roses. Its primary host is *Rosa multiflora*, however all hybrid roses are susceptible.

The disease was first reported on the West Coast of US in the 1940s. It has been on the East Coast since at least the mid-1990s. RRD occurs in close correlation with the distribution of multiflora rose and is spread by the Eriophyoid mites, which move easily in the wind. The virus does not seem to spread on tools, however, roses are prone to several other diseases that can be transmitted by tools, so good sanitation practices are always necessary.

Key symptoms to look for:

- Excessive, soft thorns
- Abnormally red elongated stem growth
- Witches broom
- Distorted buds and flowers

Be aware that symptoms are similar to herbicide damage and one can easily be mistaken for the other. If you see something suspicious, contact your local extension agent who can help submit a sample to your state disease clinic.

There is no cure for RRD, however, if symptoms are caught early, pruning affected canes down to the ground and destroying them can stop the spread and allow the unaffected portions of the plant to recover. Homeowners and landscapers can reduce their risk by pruning and disposing of old growth on their roses in late winter. This will help to remove any overwintering mites. This is recommended only for homeowners and landscapers. Growers should destroy any symptomatic plants.

If a heavily infected shrub is found in the landscape, it should be removed and destroyed. When removing roses, be sure to remove the entire root structure. While the virus does not appear to persist in the soil, it can survive in root tissue. Provided all roots are removed, it is okay to replant roses at the site. Keep in mind that there is no "safe" distance from multiflora rose, but making your best effort to keep your site and adjoining areas free of multiflora rose will go a long way in helping to prevent RRD.

At Saunders Brothers, it is our goal to provide our customers with the healthiest, highest quality plant material possible. To this end, we start our roses from bare canes from a trusted vendor. We apply a systemic miticide at budbreak as a preventative treatment and to provide residual control. We also rotate contact miticides throughout the production cycle. We carefully scout our crop and remove and destroy any suspect plants. Also, we monitor our production area for weeds, including multiflora rose. Recommendations for chemical controls of Eriophyid mites and multiflora rose can be found in the attached information sheet. Chemical recommendations are intended for licensed applicators only and label restrictions may vary by state.

Please contact us for more information about Rose Rosette Disease and best practices for managing disease risks.

ROSE ROSETTE DISEASE

PREVENTION GUIDE

Rose Rosette Disease (RRD) was first identified in the Rockies in the 1940s. It is of relatively low occurrence in most rose growing areas and is rarely seen West of the Rockies. This document has been prepared to assist growers in the identification and control of RRD. By eliminating infected plants at grower source we can ensure the vitality of the rose industry for the future.

SYMPTOMS:

EARLY SYMPTOMS:

Plants infected for less than a month will typically display one or two shoots with red and elongated stem growth (see figure a), sometimes with excessive thorniness, and unopened flower buds (see figure b).

LATE SYMPTOMS:

Plants that have been infected for several months or longer will show multiple deformed shoots often bearing deformed flowers (see figure c), and very dense “witches broom” (see figure d) like clusters of leaves and stems.

Once a plant is infected, there is no cure for RRD but infection may be prevented from spreading to healthy plants by removing the infected plants and using a combination of cultural and chemical measure described in this document.

CONFUSION WITH HERBICIDE DAMAGE:

Herbicides can often cause symptoms similar to RRD. Glyphosate can cause a compressed witches broom habit over a large section of the plant. It generally does not result in increased thorns or increased redness of stem. See table 1 for more information.

DNA TESTING FOR RRD

The causal agent of RRD is now believed to be an RNA virus. Although we do not yet have definitive proof that the virus is the sole causal agent, its presence is strongly associated with RRD symptoms. Star® Roses and Plants/Conard-Pyle's research division, NovaFlora has optimized conditions for this assay and can now perform tests for growers for a minimum charge. Contact Star® Roses and Plants/Conard-Pyle for more details.

TABLE 1

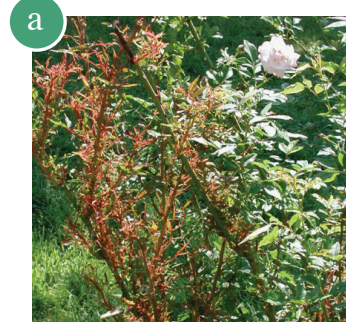
Rose Rosette Disease vs. Herbicide Damage

Figure a -
Caused by RRD:
red, elongated stem growth.

Figure b -
Caused by herbicide:
compressed witches broom habit. Leaves are often reduced in size and long & narrow. Lawn treatment with glyphosate often produces symptoms in roses.



EARLY SYMPTOMS

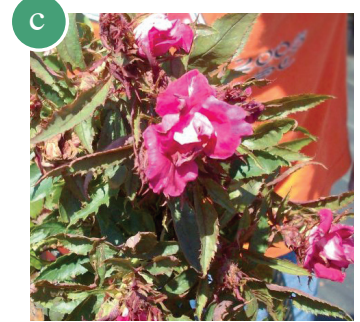


Red elongated stem growth

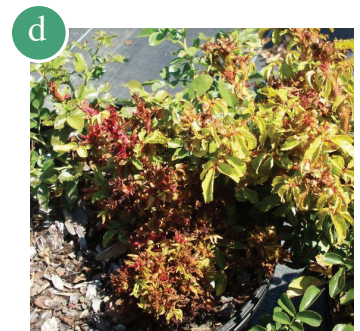


Unopened flower buds

LATE SYMPTOMS



Deformed flowers



“Witches broom” like cluster

ROSE VARIETIES AFFECTED:

All hybrid roses are susceptible to RRD. Only a few native US species roses are resistant to the disease.

VECTOR:

RRD is spread by one species of Eriophyoid mites (*Phyllocoptes fructiphilus*). Eriophyoid mites are barely visible to the naked eye and can be more easily seen with a 20X hand lens. The mites transmit the infectious agent which is most likely a virus, RRD can affect all hybrid roses and many species roses such as *Rosa multiflora*.

SPREAD:

The Eriophyoid mite is readily carried long distances by the wind to neighboring plants and neighboring fields.

DISTRIBUTION IN USA:

RRD has been reported in the Mid-West, North-Eastern US and most recently in Texas. There are few reports of RRD West of the Rockies where the main host *Rosa multiflora* is absent.

CONTROL:

Destroy infected plants as soon as possible. Plants should be burned and or bagged.

Eliminate multiflora rose. Multiflora rose is the most prevalent host for RRD. *R. multiflora* plants should be eliminated from surrounding fields within a 100-meter radius and if possible a 1.5 mile radius) of rose nurseries and gardens. Effective elimination procedures include use of mechanical and chemical methods: frequent, repeated cutting or mowing at a rate of three to six times per growing season, for 2-4 years. Herbicides have been used effectively, but because of the long lived seed in the soil, follow-up treatments are likely necessary. Application of systemic herbicides to freshly cut stumps or to regrowth is also recommended. Once eliminated surrounding fields should be monitored for regrowth in spring and early summer. See table 2 for more information.



Multiflora Rose

Photo by Nancy Gregory, University of Delaware

Pruning dormant plants just before new growth appears in late winter, will help eliminate mites and their eggs that hide in crevices of cane-petiole axis from infecting a rose crop. We recommend cutting plants back by 2/3 their size.

Star® Roses and Plants/Conard-Pyle is aggressively funding and coordinating research on many different levels, in-house and with various industry professionals. While there is no cure at this point, we are committed to combating RRD. As a leading rose genetics company, we are dedicated to leading the charge against RRD. We will keep you informed as we learn more about RRD and we ask that you please keep us informed too.

TABLE 2: CHEMICAL CONTROL FOR MULTIFLORA ROSE: *

| Name | Manufacturer | Active Ingredient | Rate | Additional Info |
|------------------------|------------------|--------------------|-----------------------|---|
| DuPont™ Escort® | Dupont™ | Metsulfuron methyl | 1-2 oz per 100 gal | Apply after break in dormancy, chemical is absorbed by foliage and roots, non-selective |
| Tordon® K | Dow AgroSciences | Picloram | 16-128 oz per 100 gal | Apply after break in dormancy, has the potential to contaminate groundwater |
| Garlon® 4 Ultra | Dow AgroSciences | Triclopyr | 2 -6 qts per 100 gal | Apply when plant is fully leafed out |
| Round Up® | Monsanto Company | Glyphosate | 1.5 oz per gal | Multiple applications may be required to achieve eradication |

* State restrictions may apply.

TABLE 3: CHEMICAL CONTROL FOR MITES:

Three chemicals registered for control of eriophyoid mites can be used. It is important that they are used in rotation every 5-7 days to prevent the mites from becoming resistant to any individual chemical. Growers who use this regime report significantly reduced incidence of RRD.

| Name | Manufacturer | Active Ingredient | Rate | Additional Info |
|---------------|--------------|-----------------------|-------------------|--|
| Avid | Syngenta® | Abemectin | 4 oz per 100 gal | Apply Avid and oil as a combination spray for best results |
| Oil | BioWorks® | Petroleum distillates | 1 gal per 100 gal | |
| Akari® | Sepro | Fenpyroximate | 24 oz per 100 gal | Recommended that a sticker be added |
| Judo | OHPA | Spiromesifen | 4 oz per 100 gal | |

For further information visit:

- pubs.ext.vt.edu/450/450-620/450-620.html
- www.ars.org/pdfs/rose_rosette.pdf
- www.rosegeek.com/
- hyg.ipm.illinois.edu/article.php?id=101

star®
ROSES & PLANTS
Conard-Pyle

LINKS

ROSE ROSETTE DISEASE

PREVENTION GUIDE

FAQ's

Q: What is Rose Rosette Disease?

A: Rose Rosette Disease (RRD) is spread by a tiny, wind-blown Eriophyoid mite (*Phyllocoptes fructiphilus* Keifer, 1940). RRD is a disease, which can affect all hybrid roses, not just Knock Out® Roses. We believe it may be a virus, but further research is needed to confirm this. RRD causes a variety of symptoms ranging from red growth to excessive thorniness, elongated shoots, deformed blooms and pliable canes.

Q: Where did RRD come from?

A: It was first identified on certain species roses in the 1940s in the Rockies. It spread down to the great plains and across the Midwest in the 1960s after the introduction of multiflora rose as a hedge and soil erosion tool.

Q: What do I do if see an RRD infected plant?

A: Immediately remove the plant and discard of it either by burning or containing in a sealed plastic bag. Do not add the infected plant to your compost bin or yard waste pile.

Q: Can RRD be spread by pruning or cutting tools?

A: No, there is no evidence that RRD can be spread mechanically. But we recommend that all tools be cleaned and disinfested after pruning to avoid spread of other common rose diseases such as crown gall and other viruses.

Q: Does RRD survive in the soil after I remove an infected plant?

A: The virus does not survive well in soil but does in plant roots that may remain in the soil. It is okay to re-plant in the same area when you have successfully removed all the infected roots.

Q: What is the best way to eradicate multiflora rose?

A: We recommend you remove any Multiflora Rose that is in the area as it is a host for RRD and the virus-carrying mite. We recommend the use of frequent, repeated cutting or mowing at a rate of three to six times per growing season, for 2-4 years. Herbicides have been used effectively, but because of the long lived seed in the soil, follow-up treatments are likely necessary. Application of systemic herbicides to freshly cut stumps or to regrowth is also recommended. Or hiring a professional weed eradication service.

Q: Will pruning help reduce incidents of RRD?

A: Yes, we recommend pruning dormant plants just before new growth appears to help eliminate mites and their eggs that hide in bud crevices of cane-petiole axis from infecting a rose crop. We recommend cutting plants back by 2/3 their size.

Q: What is your company doing to combat RRD?

A: Our company, Star® Roses and Plants/Conard-Pyle is aggressively funding and coordinating research on many different levels with various industry professionals. While there is no cure at this point, we are committed to combating RRD. As a leading rose genetics company, we are dedicated to leading the charge against RRD. We will keep you informed as we learn more about RRD and we ask that you please keep us informed too.

Q: Any way to avoid RRD if I replant in the same area?

A: Yes, for field planted crops just make sure you remove all roots from the infected plants. We also recommend a preventative treatment with mitocides.