

SPIDER MITES

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It seems every rosarian inevitably has encountered two-spotted spider mites in their garden. Some gardens seem to be plagued more frequently, while others very rarely. Generally when there are low populations of mites, a garden is in good balance, with sufficiently high numbers of the mite's natural predators to keep spider mites in check. Rosarians can influence conditions altering this delicate balance. So it is here that we embark on our understanding of the cultural changes we can implement to keep spider mite populations under control.

The first step in controlling any pest is proper identification. A few spider mites in the garden may be hard to detect, as the mites themselves are very, very small. Several references list the size of adult spider mites differently, ranging from 1/20 of an inch to 1/50 of an inch – either very difficult to see with the naked eye. Spider mites live on the underside of leaves, and, being so small, their initial damage is easier to see than the mites themselves. The first sign of spider mite damage is a stippling on the leaves, a result of the mites feeding on the chlorophyll in the foliage, bruising the plant cells with their mouthparts, and ingesting the sap. Not so long ago I could actually see the mites on the undersides of the leaves; now I find a 10X hand lens helpful in identifying these pests. When low levels of spider mites are present, detection may require sampling several leaves throughout the garden.



Two-spotted spider mite adults and eggs
Photo credit D. Handley, University of Maine



Effected foliage becomes stippled and takes on a bleached or silvery bronze cast
Photo credit J.K. Clark

You can also detect the presence of spider mites by examining the undersides of the leaves and looking for gritty sand like substances deposited along the veins. When you rub the underside of the leaf with your finger and then rub your fingers together you will feel the grit. Another suggested



Spider Mites and their webbing in a severe infestation
Photo credit J.K. Clark, University of California IPM Project

method is to tap suspect leaves over white paper. When the spider mites are agitated they can be seen scurrying on the paper. As mite populations become elevated, the effected foliage becomes stippled and takes on a bleached or silvery bronze cast and often drops prematurely. In severe mite infestations, webbing occurs among the leaflets.

Before addressing suggested control measures, let's talk a little about the mites themselves. Spider mites are classed as a type of arachnid, *Tetranychidae urticae*, a close relative of spiders. **Spider mites are not insects** – and insecticides (at least the majority of them), will not kill spider mites. **In fact, the use of most insecticides will actually increase spider mite populations.** A major reason that spider mites become a problem in the rose garden is the use of insecticides destroy the mite's natural enemies (including, but not limited to, western flower thrips, lacewings, lady beetles, and predatory mites), but do not kill the spider mites – allowing them to reproduce without control. Research shows that Carbaryl (Sevin) devastates most spider mite natural enemies of the spider mites and can greatly contribute to spider mite outbreaks. Malathion can aggravate some spider mite problems, despite being advertised frequently as effective mite control. Soil applications of systemic insecticide imidacloprid (Merit, Marathon) have also contributed to some spider mite outbreaks.

When treating for mites, you need to use a miticide – NOT AN INSECTICIDE!

The two-spotted spider mite is an example of a 'warm season' mite. The females over-winter in the soil or on host plants, and become active in April or May when they seek out the underside of the leaves on suitable hosts. Each female may lay over 100 eggs. Research has shown that a generation, egg to egg-laying adult, takes 7.3 to 36.3 days, depending on the temperature. Development of the two-spotted spider mite will vary with conditions such as temperature, humidity, host plant, leaf age, etc. However temperature is the most important factor influencing the rate at which mites develop. The hotter it gets, the faster they reproduce. A few spider mites can quickly become thousands, and if left unchecked, can completely defoliate a plant.

Extensive research performed on strawberry crops concluded that soil moisture and method of irrigation impacts mite populations. Soil with low to moderate moisture content had higher mite populations than soil with high moisture content. Crops irrigated with drip irrigation had lower mite populations than crops irrigated with a combined drip and overhead irrigation and overhead irrigation alone. Perhaps one can conclude roses grown in soil with high moisture content and irrigated with drip or micro spray will have lower mite populations. Perhaps this research is not applicable to roses, however before dismissing the probability one can conclude stressed plants are more susceptible to insects and diseases. When plants are deprived of water, the sugars inside the leaves become more concentrated, increasing the feeding of two spotted spider mite and promoting outbreaks.

Controlling spider mites, as previously mentioned, begins with early detection and action!!! **An environmental friendly and economical control of spider mites can be achieved with water ... Yes, WATER. This method of control is highly recommended for those with a smaller garden.** A strong, forceful jet of water, directed to the underside of the leaves, can physically remove and kill many mites and their eggs, thus interrupting their reproduction cycle. **This method also helps conserve natural predators.** I recommend "blasting" every other day for a week, and then periodically to maintain control. Just attach a spray nozzle to your water wand. A "Diagram for building a mite blaster" is posted on the CFRS website under the "Rose Information" section: <http://www.centralfloridarosesociety.org/info/index.asp>.

If the "blasting" method is not feasible, I would then turn to a miticides. The use of miticides can be very effective in controlling spider mites. But remember, **miticides should only be used as needed ... NOT as a preventive.** Unfortunately, most miticides are very expensive and packaged in sizes that cannot be consumed by most home rose gardeners within a two-year period (the estimated shelf life). Therefore, they are not economical for

those with a small rose garden. Additionally, most product labels advise not to use the same product in succession, as resistance is likely to occur. With the spider mite's development rate of egg to egg laying in 7.3 days, it is certainly plausible spider mites can become immune to a chemical. Knowing the life cycle of the mite and the mode of action of the selected miticides is important in the timing and frequency of a miticide's application.

All miticides are not the same. They can vary widely in their mode of action and longevity. Some kill only adults, others adults and eggs. Some need to be applied more frequently than others. Some can be mixed with your fungicides ... others work only when applied alone. To be effective, most miticides should be applied to the underside of the foliage, while others have translaminar properties (meaning spray material applied to upper leaf surfaces is absorbed and translocated throughout the leaf). Consider the differences in order to make an informed decision on which product to purchase. Then, to obtain the best results, read the label carefully before applying. If, after reading the label, you still have questions, call a Consulting Rosarian for advice.

Avid has both contact and translaminar properties. It kills mites in the adult stage, **but does not kill eggs.** Studies have shown that spider mites remain in the egg stage for 2.8 days, possibly less, at temperatures above 86 degrees. Therefore the frequency and timing of subsequent applications of Avid have to occur within a specific number of days in order to eradicate the new mites just hatched. For best results it is not recommended to mix Avid with your fungicidal sprays.

Miticides with sterile inhibitors and ovicides, such as **Hexygon DF**, can be more effective, as it kills the eggs in addition to affecting the reproductive viability of adults. Hexagon kills the eggs and immature stages through direct contact or by contact with treated surfaces. Hexagon does not kill adult mites, but after treatment the eggs produced by females are not viable. (For those who are already using *Avid*, you can pick up the benefit of an ovicide by adding Hexygon).

Floramite SC controls all stages of mites, including eggs. It provides quick control through contact. Floramite is also easy on beneficial insects, helping maintain a good balance in the garden. Floramite can be tank mixed with your fungicidal sprays. The current label states not to use more than once every 21 days. I have found that one spraying usually knocks out the mites.

TetraSan 5 WDG affects spider mites at all life stages by stopping the development of spider mite eggs and larvae and sterilizing females. It controls through contact and translaminar properties and is said to provide spider mite control without harming beneficial insects.

Forbid 4F, a relatively new miticide, provides translaminar action, and is labeled for control of mites in all stages. But is reported to be most effective on the egg and nymph stage.

If asked which methods would be best for controlling spider mites in home rose gardens, I would suggest using the water wand or mite blaster on a regular basis. If a miticide is warranted, I recommend Floramite for the following reasons: It is effective on all stages of mites; it can be tank mixed with your fungicidal spray (does not require a separate spraying); and Floramite is less harmful to predacious mites and beneficial insects.

Learn the signs of spider mites and be observant in the garden, especially as temperatures increase. Act quickly to take control. Maintain good cultural practices and provide ample soil moisture and irrigation. Reduce the amount of insecticides used in your garden — using insecticides only when absolutely necessary. Strive to maintain a healthy balance of beneficial insects. Nobody likes spider mites. **Don't let them get the best of your roses.**

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