SPIDER MITES
By Marty Pawlikowski, Master Rosarian *(updated May 2024)*

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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 – both 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.

You can also detect the presence of spider mites by examining the undersides of the leaves and feeling 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 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 takes on a yellow or silvery bronze cast. Once the foliage becomes bronzed, it 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, *Tetrncychidae 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 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 female mite 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.*** Just attach a spray nozzle to your water wand … or if you are handy, you might want to build a "mite blaster" (see diagram below). I recommend "blasting" every other day for a minimum of a week, and then periodically to maintain control.

If the "blasting" method is not feasible, I would then turn to a miticide. The use of miticides can be very effective in controlling spider mites. But remember, ***miticides should only be used as needed … NOT as a preventative.*** 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.

The trade name of the pesticide (Avid) is provided along with the active ingredient (abamectin) as there a quantity of other manufactures which produce the same product with the same percentage of active ingredient(s) under a different name and the price of the product can be variable between manufactures. Therefore, searching for pesticides under the active ingredient may result in a reduction of cost. Additionally the list provided below does not list all miticides, and it should be noted that some of the miticides have bee warnings.

Avid (abamectin Group 6) 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. Avid is also effective on controlling thrips with a label warning that using it to control thrips can lead to loss of efficacy on mites. Although if used in rotation with other insecticides for thrips may not lose efficacy on mites and will work in maintaining lower mite and thrips, specifically Chili Thrips populations.

Miticides with sterile inhibitors and ovicides, such as **Hexygon DF** (hexythiazox- Group 10B) , 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).

Talstar (bifenthrin - Group 3A) higher application rates and/or more frequent treatments may be required for acceptable control during mid to late summer. The addition of surfactant or horticultural oil may increase effectiveness. Avid also makes the same statement about the addition of horticultural oil with the caution that "some plants are sensitive to oils and so without prior experience the user should spay a small number of plants and observe plants for 2 weeks before spraying the remaining plants." With Florida's higher summer temperatures the addition of oil to increase efficacy is not recommended.

Floramite SC (bifenazater - Group 25) 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 (etoxzole- Group 10B) 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 (judo-sprieinesifren - Group 23)**,** 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.

Pylon (Chlorfenaypr - Group 13), is a member of the class of miticides-insecticides known as Pyroles. Pylon has good contact and excellent stomach activity and results in the mite's death for the inability to generate its own energy necessary for life. If tank mixed with fungicides, as an example, Pylon must be added to spray tank first and mixed then the other pesticides can be added.

Conserve (Spinsosad - Group 5), is a fermentation derived insect control agent. Commonly used for Chili Thrips Conserve is also labeled for spider mites at a higher dilution rate. Currently there is only one other Group 5 miticide, which is Spinosad and should not be rotated with each other due to the same mode of action.

Mavrik Aquaflow (Tau-fluvalinate - Group 3) works primarily through contact action, thus thorough spray coverage is required. Mavrik Aquaflow also can be used for chili thrips, although this pesticide is non selective and will eradicate some of the beneficial insects which will keep spider mites and chili thrips populations at acceptable levels.

Talstar (Bifenthrin - Group 3) Like Mavrik Aquaflow, since it is a Group 3 pesticide, it requires thorough spray cover as it relies on contact to kill the mites and is also non-discriminatory in eradicating beneficial insects.

Sultan (cyflumetofen - Group 25) controls all stages of life, eggs, immatures and adults and has a rapid knockdown with long residual activity, compatible with beneficial, including predatory mites.

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. Same with Sultan, but be prepared for sticker shock.

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 quantity and frequency 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.**

The two-spotted spider mite,
Tetranychus urticae, shown at 300x

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

Eggs of the Two Spotted mite cannot be seen easily with the unaided eye. 300x

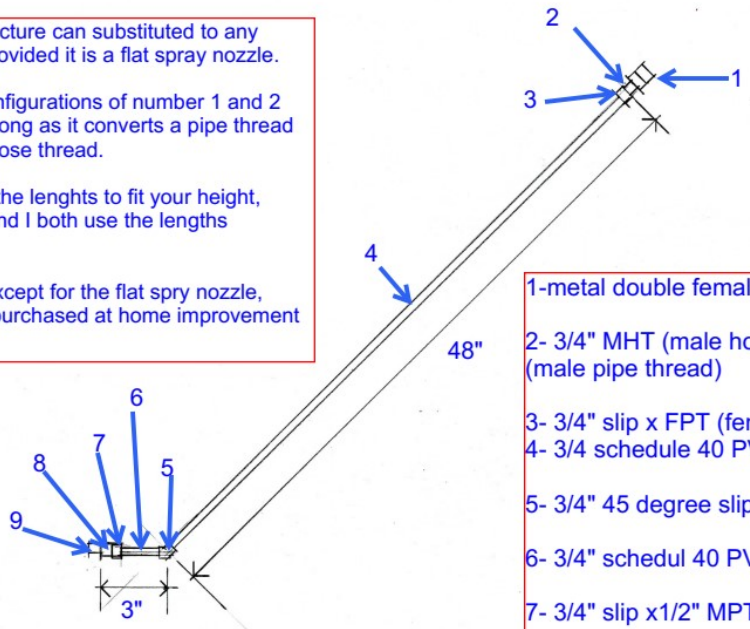
Mite Blaster

The nozzle manufacture can substituted to any manufacturer as provided it is a flat spray nozzle.

There are other configurations of number 1 and 2 which will work as long as it converts a pipe thread fitting to a female hose thread.

Feel free to adjust the lenghts to fit your height, although my wife and I both use the lengths illustrated here.

These materials, except for the flat spry nozzle, number 9, can be purchased at home improvement stores.



1-metal double female adapter (hose threads)

2- 3/4" MHT (male hose thread) 3/4" MPT (male pipe thread)

3- 3/4" slip x FPT (female pipe thread)
4- 3/4 schedule 40 PVC

5- 3/4" 45 degree slip x slip

6- 3/4" schedul 40 PVC

7- 3/4" slip x1/2" MPT reducer

8- Rainbird shrub adaptor

9- Rainbird 8HFLT 8" MPR half circle flat spray nozzel.