

# Mites

By Susan Jones

Mites are almost-microscopic creatures, closely related to ticks, spiders and scorpions. Because of their size, their presence is usually not suspected until considerable damage has occurred. Mite damage makes a plant's leaves look silvery, especially on the underside, where the pests have killed the cells of the surface layer. From the top, the leaf often has many tiny yellow spots that turn brown over time. Spider mites also spin silken webs on the undersides of leaves. These are easy to see if you mist the foliage with water and hold the plant up to the light. You might even see the tiny mites walking along their webs. False spider mites do not make silk, and are extremely tiny and hard to see, but they produce the same silverying of the leaves.



Red Spider Mites live up to their name; they do make webs.

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A good way to tell if you have mites is to wipe a white cloth or tissue over both sides of a leaf of a plant suspected of mite infestation. If mites or their eggs are present, reddish or brownish streaks will be seen on the cloth. Another test is to tap a leaf over a piece of white paper and see if any of the dislodged particles move. A good magnifying glass is recommended with this test.

Mites can severely weaken plants, as well as disfiguring them. Mites damage orchids by removing sap and chlorophyll with their needlelike mouthparts. It is this withdrawal of chlorophyll that results in the characteristic blanching and silvery appearance of the leaf. Their sap sucking can also cause bruised-looking areas on flowers. Because of their feeding style, they are also potential vectors of diseases

## Life Cycle

The adult female lays one large (for her) egg at a time, which hatches into a tiny nymph. After molting a few more times, the adult stage is reached again. The life cycle speeds up under warm conditions; adult to adult takes only a week at high temperatures..

When colonies become overcrowded, winged forms appear, to fly to establish new colonies. The insects can cycle continuously under greenhouse conditions, their rate of development affected only by temperature.

In the autumn, females begin producing a few males. Females born at the same time have eggs within their bodies; they mate and lay the eggs to provide next season's offspring.

## Types of Mites

***Brevipalpus californicus*** The first observable injury from this mite feeding on orchid leaves appears as silvery areas that eventually become sunken and brown. Heavily infested leaves will become yellow and drop from the plants. Individuals of *B. californicus* are difficult to see because they lie flat against the leaf and move slowly; however, populations can be detected by the presence of cast skins.

**Phalaenopsis mite (*Tenuipalus pacificus*)** This is one of the false spider mites, which do not spin webs. This mite is a pest in California, Florida, Panama and some European countries. Feeding by these mites causes dark spots on leaves and eventual tissue death. This mite has a slow development; the incubation period requires 18 to 23 days, and each of the developmental stages 14 to 15 days; therefore, the life cycle is at least 64 days.

**Two-spotted Spider Mite, also known as the Red Spider Mite (*Tetranychus urticae*)** These mites are greenish-yellow, wingless, eight-legged creatures with a dark spot on each side of their bodies. As day lengths shorten in the autumn, they become deep red in color. As their population builds, you will start to see webs and aggregations of mites at certain sites, usually the growing points of the plant. They feed on leaf undersides and suck the chlorophyll out of plant cells. These mites thrive when plants are stressed under warm, dry conditions, but they are less of a problem under conditions of high humidity. Two-spotted spider mites are most often found on new growth and on thin-leaf orchids.



Mites can multiply quickly during warm, dry conditions and get out of control before you even notice them.

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An adult female two-spotted spider mite will lay three to five eggs per day on the underside of leaves. Each adult female can produce more than 100 eggs in three weeks. They reproduce at alarming rates: 10 spider mites in May are capable of becoming 1,000 by June and 100,000 by July. Part of this equation is because the egg incubation and adolescent-to-adult periods are drastically reduced as temperature increases. Egg to adult takes about 14 days at 70 F, or less than a week at 86 F. As temperatures increase, what started out as a small population of mites can become a major infestation in just a few days.

To make matters worse, red spider mites can overwinter without feeding and emerge in the spring and summer to reinfest plants, although artificial lighting may stop the mites from hibernating, making control easier.

## **General Prevention**

To minimize orchid pest problems, implement such cultural management strategies as prevention, sanitation and plant inspection. Proper cultural conditions, such as the correct amount of water, temperature, light, fertility and humidity, minimize potential pest problems. Be sure to know the cultural practices specific to the orchids being grown.

Sanitation is another strategy to prevent orchid pest problems. Remove all plant debris and old potting medium. Also, remove old leaf sheaths to eliminate hiding places for pests. Inspect plants on a regular basis by looking underneath leaves to check for spider mites.

## **Methods of Control**

The first line of defense against mites is to raise the humidity in the growing environment. Mites are usually most severe on plants in heated greenhouses or in the home during the winter, when the air is quite dry and there are no natural enemies to keep them under control. Washing the plants thoroughly, wiping every leaf, is one way to bring the population down. Because mites feed by sucking the sap from individual cells of the surface of the leaves, and plant sap is very dilute, mites must consume a lot of sap to get the nutrients they need, and get rid of all the water they do not need. Therefore, they do better when the air is dry, as it is easier for them to get rid of the water.

If the time of year allows, put the plants outside - the natural enemies in the garden plus the more difficult environment will usually sort out the problem.

Another option is biological control. Predatory mites are released onto the infested plants, where they eat harmful mites. This strategy works well only if you mite population is not too large for the predators to catch up. Consult biological control supplier catalogs for natural enemies available for each type of mite. One word of caution: if you are using biological controls to eliminate mite populations, do not use chemical pesticides as they will kill the beneficial mites, too.

Most insecticides have little effect on mites, but a number of chemicals (called acaricides or miticides) are developed specifically for mite control. These are useful in controlling large populations of mites. Use these chemicals with care, and do your spraying cautiously, so that you get the maximum effect. Be aware that some insecticides and miticides cannot be used on orchids. Many materials have not been tested on orchids, so try any material on a small group of plants - especially when they are in flower - before exposing the entire collection to a new chemical.

Another less-exotic and much cheaper method of control involves a pint of 409 household cleaner and a pint of rubbing alcohol mixed with water to make 1 gallon of spray. This method is especially effective as a preventative or to control light infestations. For any miticide, homemade or purchased, apply a heavy coating, especially to the underside of leaves. Reapply every three to four days for six to eight applications. This will ensure that both the adults and hatching young are eliminated.

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