# MITES: A Tiny Yet Serious Pest

*Denise L. Olson & Ronald D. Oetting*
*The University of Georgia*

## Mite Pests of Flowering Plants

The species of mite pests are numerous and several mite species are pests of flowering plants in the home, garden, and greenhouse.

The mite species most commonly found include the two spotted spider mite (TSSM,) also known as the red spider mite, is the most common mite; cyclamen mite; broad mite; carmine mite; and bulb mites, including the lily bulb mite, the most frequently encountered bulb mite. The two spotted spider mite can be frequently found on African violet, azalea, camellia, chrysanthemum, citrus, ligustrum, pyracantha, orchid, rose and viburnum as well as others. The cyclamen mite favors gerbera, snapdragon and African violets. This mite also favors garden plants such as delphinium, dahlia and strawberry. The broad mite prefers to feed on ivy, impatiens, and peperomia. The bulb mites attack many species including onion, narcissus, hyacinth, tulip and lily. The carmine mite is commonly found on carnation.

## Description & Biology

Mites are not true insects but they belong to the Arachnida or spider group. Mites can be distinguished from insects by their tiny oval shape and eight legs, whereas insects have 6 legs. However, like insects, the immature mite stage has six legs.

The tiny eggs are globular or flattened above and are pearly, amber or red in color. Mites are very tiny, ranging in size from 0.3 to 1 ml in length. Their color varies with species. The TSSM is yellow-green to dark green, with two dark spots on either side of the abdomen.

The carmine mite is a tiny reddish mite, and the younger stages are white. Adult cyclamen mites are amber- or caramel-colored. The younger stages are also white. The body of the bulb mites is pearly white with short, reddish legs.

The developmental time from the egg to adult depends upon the host plant, plant tissue age and nutritional status, and environmental temperature. Though developmental time does vary somewhat with mite species and environmental conditions, a general guide can be used for those mites commonly found on flowering plants in the home, garden, or greenhouse. Mites are considered a dry weather pests and are favored by dry, warm (70°F) conditions such as those found in homes, greenhouses or in the garden when outside conditions are dry and warm. Under these conditions the average time from egg to adult is 14 to 21 days. However, reproduction and development is favored by hot dry conditions, and the time from egg to adult can take as few as 7 days during hot, dry periods.

## Feeding Damage and Symptoms

Mites are not visible by the naked eye, thus they are often unnoticed until damage by their feeding is detected. Because they are very tiny, often the damage mites cause is blamed on mistakes in cultural management, spray injury, or even on a virus or disease. Mites feed by stylet-like mouthparts, penetrating and removing sap from the tissue cells.

As a result, when mites feed, the green pigment (chlorophyll) disappears from the plant tissue. Because the damaged tissue has no chloroplast this gives the injured area a pale or yellow stippled appearance. The symptoms of damage will vary depending on the species feeding on the plant. A heavy mite infestation can severely defoliate or kill a plant.

Two spotted spider mites can be found feeding on the underside of leaves. However, the stippled appearance is visible on the upperside of the leaves. When damage is severe, the leaves may dry up and drop. The TSSM is most active during hot dry conditions. This mite will remain active during the winter months in homes and greenhouses where conditions are warm and dry.

Cyclamen mites feed on the leaf and flower buds. This feeding damage results in scattered areas of the plant or whole leaves to curl, wrinkle or be cup-like. When damaged, the flower buds will be distorted and may drop or fail to open. Cyclamen mites do prefer younger growth, however they will feed on the more mature growth. The cyclamen mite is most active during early spring to June, but they are inactive during the hot summer months. They will become active again during late summer to early fall. During the winter months the cyclamen mite will live about 1/2 inch deep in the soil at the base of the plant where the roots and stalks join.

Broad mites feed on the developing buds and underside of leaves. Feeding damage can result in bronzing and or cupping of the leaves, stunting of the plant and plant death if infestation is severe.

The bulb mites prefer to feed on injured or weeken plant tissue. However, they can invade healthy tissue and sometimes will reach high numbers during the bulb production season.

## Detection and Sampling

Successful mite control is based on a good program of inspection and sanitation. Care should be taken to avoid introducing mites into the home, garden, or greenhouse.

Always inspect plants before purchasing them. While plants are in the home, garden, or greenhouse inspect them frequently for mites with the aid of a 10x or 15x power magnifying glass. When checking plants for mites, thoroughly wash your hands between plants to prevent transferring mites to uninfested plants.

Because of their small size, mites may not be detected until high numbers are present and noticeable damage symptoms are very apparent on the plant. To best detect mites look for the stippling on the upper side of leaves or other plant tissue. In addition, look for the presence of delicate webbing on the underside of leaves.

Mites form a protective webbing over the eggs and mites themselves. Mites shed their skin when molting to the next life stage, therefore the presence of white cast skins also can be detected on the plant. When the stippling, webbing and/or caste skins is noticed, the presence of mites can be easily determined by sharply tapping an affected leaf over a sheet of white paper. Because mites are easily seen against a white background, green, red or yellow specks the size of pepper grain will drop to the paper and begin crawling. When mites or damage is detected it is important to promptly treat the plants.

## Mite Management

Specific control strategies can be given for each mite species, however a general guide for management can be used for those mites commonly found on flowering plants in the home and garden, including commercial production.

### *Home*

During the period of mite control isolate those plants infested with mites. In addition, discard severely infested plants. Prune out damaged infested tissue to reduce the movement of mites to unin-

fested areas on the plant. Be sure to clean the pruning tools between plants.

Individual house plants can be treated with hot water by submerging the plants in water 110°F for 1 hour. This method may be injurious to some plants, so test this method on a single plant for any given variety.

Mites can develop higher populations on water-stressed plants, so proper watering of plants will help prevent high mite populations from developing.

When the above methods are not effective at controlling a mite infestation, miticides (acaricides) can be used. Formulations containing dicofol or dienchlor are suitable for mite control in the home. In addition, insecticidal soap or horticultural oil can be used in the home for mite control.

### *Garden*

In the garden, clean out weeds that are hosts for mites, and always visit mite infested plants last. Because mites are a dry environment pest, misting or vigorously spraying the plant with water is a good control method, provided the plant can tolerate this.

Beneficial insects such as lady beetles and predatory mites can play an important role in controlling a low population of mites on flowering plants in the garden. It is important not to apply insecticides unless other insect pests become a problem in the garden. Most insecticides are broadspectrum and therefore are harmful toward beneficial insects as well as pest insects. In fact, most insecticides will remain harmful toward beneficials up to one month after application.

In addition to killing beneficial insects, organophosphorus insecticides stimulate mite reproduction, resulting in rapid increase in the mite population. Therefore, it may be beneficial to use an insecticide of another class. Diazinon and dicofol as well as insecticidal soap and horticultural oil can be used in the garden. The best control for bulb mites is to soak the bulbs in a registered miticide for 30 minutes before planting.

### *Greenhouse*

As in the home or garden, severely infested plants in the greenhouse should be discarded and infested tissue should be pruned out of the remaining plants. Spraying plants with a hard stream of water is also an effective control method.

Several chemicals are available for mite control in the greenhouse, including abamectin, bendiocarb, bifenthrin, chlorpyrifos, diazinon, dicofol, fenpropathrin, flucycloxuron, pentac, and pyridaben. Insecticidal soaps and horticultural oils also can be used in the greenhouse.

It is important to know that a change in insecticide, which has no miticidal activity, can influence the occurrence of new mite pests. For example, a change to the insecticide imidacloprid for whitefly control on poinsettias in 1995 is believed to have contributed to the appearance of the Lewis mite.

## Miticide Application and Label

In the home, garden or greenhouse, when applying a spray or powder formulation be sure all plant tissues, including the under and upper leaf surfaces, are thoroughly covered. To control mites as they hatch from the eggs, respray 2-3 more times at 5 to 7 day intervals. Refer to the *1996 Georgia Pest Control Handbook* for specific recommendations in each situation.

Precautions must be taken when applying miticides to flowering plants. The plant you want to protect should be listed on the miticide label. Many labels simply say *ornamentals*, which means that the chemical can be applied to any plant that is an ornamental. However, though the label may state

ornamentals in general, there is no guarantee that the material is not phytotoxic to some varieties of ornamentals. Always test a few plants or a small area of the plant before applying to the entire plant or all of your plants.

If a chemical is phytotoxic to a plant, symptoms will usually become evident within 48 hours of application. Often phytotoxicity can be reduced if the plants are sprayed during the cooler hours of the day and allowed to dry in a well-ventilated place. Powders and dusts are generally less injurious to plants than sprays or aerosols. However, powders and dusts may leave an unsightly residue on the plants.

When applying miticides to flowering plants in the home or garden always follow all safety procedures listed on the label. When making miticide applications to houseplants, place the plants outdoors, if possible, or in an area that will not be in contact with people, pets or food.

If plants cannot be placed outdoors, follow the precautions on the label for indoor treatment. When treating plants in a commercial greenhouse always follow the Worker Protection Standards (WPS) and Re-Entry Interval (REI) listed on the chemical label.