

Managing Two-Spotted Mites in the Greenhouse

The two-spotted mite (TSSM), *Tetranychus urticae*, is the predominant mite species in greenhouses, feeds on a wide range of crops including herbs, herbaceous perennials and annuals, and greenhouse vegetables. This mite can be very difficult to control because of its short generation time, potential for rapid increase and development of resistance to many commonly used miticides. Growers often overlook spider mites, due to their small size and tendency to feed on the underside of leaves, until outbreaks occur.

Identification

Spider mites are more closely related to spiders and ticks than insects. They have eight legs rather than six legs and only two body regions (the head and thorax are fused together). Adult females are small, (less than 1/50 of an inch long), soft-bodied and oval in shape. Color varies from greenish or yellowish to orange with two dark spots on either side of their body. Bright orange forms occur when adult females are overwintering. Spider mites have a pair of silk glands near their mouthparts enabling them to spin webbing or silk threads.

Feeding Damage As spider mites insert their stylet-like mouthparts into plant tissue, they suck out plant juices reducing chlorophyll and moisture content with the leaf cells. At first, you will see a slight flecking or stippling (chlorotic spot) on the leaves.



Figure 1: Flecking or stippling as signs of spider mite feeding. Photo by L. Pundt

As mite feeding continues, leaves can turn yellow, bronzed and drop from the plant.



Figure 2: Spider mite feeding can also result in yellowing leaves, resembling a nutrient disorder. Photo by L. Pundt



Figure 3: Spider mite damage on ivy geraniums resembles oedema. Photo by L. Pundt

When high populations develop, fine webbing is extensive. Spider mites migrate to the young, new growth where they can become easily airborne and blown to new hosts.



Figure 4: When high spider mite populations develop, fine webbing can be seen. Photo by L. Pundt

Two-spotted spider mites can feed on over 300 different species of plants. Many greenhouse ornamentals are favored hosts including dracaena spikes, ivy geraniums, New Guinea impatiens, garden impatiens, hydrangea, *Ipomoea*, marigolds, poinsettias, vinca vine, verbena and viola. Many herbaceous perennials including hollyhock, monarda, columbine, daylily, butterfly bush, primula, scabiosa, verbena, and salvia are also prone to mites. Herbs such as lemon balm, lemon verbena, lemon grass, oregano and mints can also be favored hosts. Greenhouse vegetables including cucumbers, tomatoes and beans are susceptible to mites. Weeds such as chickweed, oxalis, pigweed and henbit found in and around greenhouses can be sources of continuing infestations.

Biology and Life Cycle

Adult females can live for about one month and lay from 100 eggs during this period. Mite eggs are small, spherical in shape and are laid singly on the underside of leaves. Eggs hatch in about three days and the young mite larvae immediately begin feeding. After going thru two nymphal stages, mites become adults. Adult females begin laying eggs within 1 to 3 days and do not have to mate to reproduce. The life cycle from egg to adult can vary from 7 to 21 days

depending upon greenhouse temperatures. Spider mite populations increase rapidly during warm, dry conditions, when temperatures are between 68° F and 86° F and relative humidity is 30 to 50%. Spider mites can develop from egg to adult in as little as 7 days at temperatures above 80° F.

Prevention

- Inspect incoming plants for signs of mites or their damage.
- Avoid over fertilizing plants. Spider mites are more able to feed upon this lush, succulent growth. Increased fertility levels, especially nitrogen, provide amino acids that are needed for the spider mites to develop.
- Eliminate weeds in and around greenhouses that can harbor spider mites.
- Promptly remove unsold or “pet plants” as older plants may be a source of mites for younger plants.
- Avoid allowing plants to become water stressed, as those plants have higher levels of amino acids, which are favorable to spider mites.
- Overhead watering both helps wash spider mites off plants and increases relative humidity in the plant canopy.

Scouting

Inspect plants weekly for signs of spider mite feeding. In the greenhouse, focus on scouting hot and dry locations near furnaces and hanging baskets. Check near the doorways and vents, where mites may be blown in from weedy areas outside. Tag pest infested plants as indicator plants to determine the effectiveness of control measures.

Plant inspection is needed to detect all stages of mites. First, look for slight discoloration or flecking. Stippling does not occur on ivy geraniums. Mite injury on ivy geraniums resembles oedema, but the damage spreads to the youngest leaves. Then, turn over leaves, especially the older, more mature leaves and look for the spider mites that tend to be found along the leaf vein. Use a 10 - 20-x hand lens to detect the eggs and all stages of mites. Look on the underside of the leaves for cast skins and empty eggshells, too. Because mites are easily carried on workers or their clothing, do routine greenhouse tasks and scout in mite-infested areas at the end of the day.



Figure 5: Empty eggshells and cast skins of spider mites. Photo by L. Pundt

Biological Controls

Outdoors, natural enemies such as predatory mites, thrips, ladybeetles, predatory midges and pathogenic fungi help to keep the spider mite populations low. Several different predatory mites are commercially available. See [Biological Control of Spider Mites](#) for more information.

Chemical Controls

Contact or translaminar miticides may be used. When treating with contact materials, thorough coverage is needed to the underside of the leaves where the spider mites are feeding. Resting stages and eggs can be more tolerant to many miticides so repeated applications are often needed.

Spider mites develop resistance to miticides very rapidly. The miticides used in your rotation schedule should have different modes of actions (i.e. come from different pesticide classes and work differently). Follow long-term rotations and all label restrictions in terms of amount and frequency of use. Many of the newer miticides are more selective toward a particular life stage or are more effective when populations are low.

Regular monitoring, careful timing and application are needed to get the desired results with more selective miticides. Consult the most recent edition of *New England Greenhouse Floriculture Guide* for more specific up-to-date

recommendations. Available from the [Northeast Greenhouse Conference and Expo](#) and the [UConn CAHNR Communications Resource Center](#)

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