

Manipulate mites

Scouting, early responses help minimize spider mite damage in nursery crops. By Steve Frank and Adam Dale

Spider mites are among the most ubiquitous and damaging nursery pests. Spider mites damage plants by puncturing leaves with their mouthparts and sucking out cell contents. This results in tiny brown or

gray dots on the leaf surface called stippling (Figure 1). Extensive stippling gives foliage a gray or brown cast and reduces photosynthesis and plant growth. Spider mites also produce silk webbing that accumulates debris

and can become noticeable to consumers. Since spider mites are very small and reproduce rapidly, you may not notice them until they have caused severe damage to plants. Many spider mite species feed on nursery

crops. We will discuss some of the most common species that together create year-round headaches.

Cool-season spider mites

Cool-season mites are active during the spring, early summer and fall, though at high elevations or latitudes, they may be active all year. Cool-season mites generally spend winter and summer dormant as eggs. The two most significant cool-season mites in nurseries are the spruce spider mite and southern red mite. Their hosts are evergreen plants, so damage remains on plants for years. Thus, scouting for mites before damage is critical.

Spruce spider mites, *Oligonychus ununguis*, are generalist pests of conifers such as arborvitae, spruce, and juniper. Spruce spider mite adults are dark green or red depending on their host plant. Eggs are light brown during feeding seasons and red during winter. Eggs are deposited at the base of needles or under silk on



Figure 1. Stippling caused by two spotted spider mites on roses. **Figure 2.** (Inset) Egg, juvenile, and adult southern red mites.

INSET PHOTO BY JIM BAKER, NCSU

PESTS & DISEASES

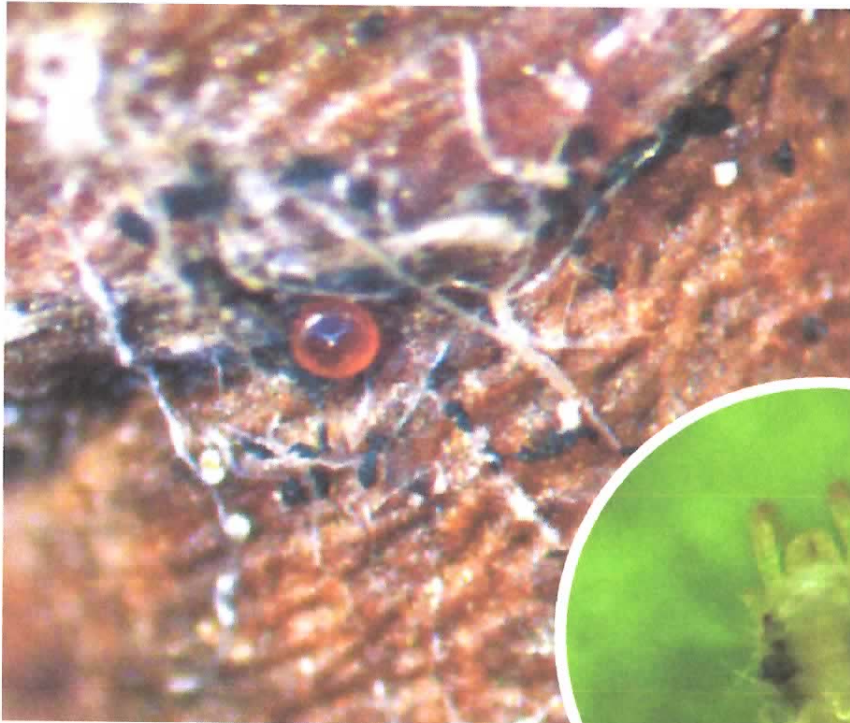


Figure 3. (Inset) Two spotted spider mite.
Figure 4. Maple spider mite egg on a maple twig.

the bark. They hatch in early spring at about 160° F degree-days (FDD). Development from egg to adult takes one to two weeks. Stippling caused by spruce spider mites gives needles a red or brown cast. Spruce spider mites feed on the interior, older needles of plants causing the center of plants to turn brown and die. This makes them harder to control because pesticide coverage of dense interior foliage is difficult. Even after mites are controlled, plants with sparse interior foliage and discolored needles are unmarketable.

Southern red mites, *Oligonychus ilicis*, are pests of broad-leaved evergreen plants in the southeast and California. Adult southern red mites are dark red to brown, with a light red to orange head region (Figure 2). Southern red mites overwinter as red eggs on the bottom of leaves. Eggs hatch in early spring around 100° FDD. They feed on the underside of leaves, causing gray or brown discoloration. Heavily damaged leaves die and fall off, making the plant look sparse. Southern red mite hosts include azalea, holly,

camellia, cherry laurel, rhododendron, Japanese holly, pyracantha and viburnum.

Warm-season spider mites

Warm-season spider mites are among the most damaging and difficult to control pests of deciduous trees, shrubs, and herbaceous plants. As their name implies, they thrive during hot weather. Hot weather reduces development time so populations grow quickly. Heat can also reduce plant defenses and natural enemy abundance creating great habitat for spider mites.

The two spotted spider mite, *Tetranychus urticae*, is one of the most common and widely distributed spider mites in the United States. Adults are yellowish with a large black spot on each side (Figure 3). The two spotted spider mite becomes active around 360° FDD and remains active until fall. They can develop from egg to adult in as few as five days depending on host quality and temperature. Two

spotted spider mites are more common on perennials than woody plants. Roses are a preferred host and one of the most economically important hosts of two spotted spider mites (Figure 1).

The maple spider mite, *Oligonychus aceris*, only feeds on maples but can cause extraordinary damage to leaves. Adults have multiple hairs along their back, with yellow legs and a black body. Eggs are clear to yellow and are found on the underside of leaves. They overwinter as red eggs in bark crevices (Figure 4). These mites are active from spring until late fall but peak around late summer depending on the region. Mite feeding causes leaves to appear bleached in summer and reduces fall color.

Monitoring

Scout for spider mites in the winter or spring on plants that have damage from the previous year. Look for eggs at the base of needles, on the underside of leaves, and in bark crevices using a hand lens. During the growing season, scout for mites by beating foliage against a white sheet of paper on a clipboard. Dislodged mites will appear as small, dark spots moving around on the paper. Predators such as phytoseiid mites, minute pirate bugs, or green lacewing larvae may also appear on the paper. Unfortunately, there are no established thresholds to help growers decide if management action is needed. However, mites reproduce very quickly so if you find a few this week, it could mean you could find thousands by next week. By the time mite damage appears on plants, mites have been present for a while. In addi-

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tion, even if mites are no longer present, prior mite damage may worsen late in the season as leaves experience heat or drought stress.

Cultural management

Cultural control strategies such as minimizing plant stress and avoiding excessive fertilization can reduce mite outbreaks. The cultural practice most likely to increase mite abundance is insecticide applications. Contact insecticides such as pyrethroids are known to cause mite outbreaks by killing predators. Recent research documents that imidacloprid can also increase mite abundance by killing predators and increasing spider mite reproduction. This even occurs after drench applications.

Biological control

Spider mites are prey for many gener-

alist predators such as predatory mites, lady beetles, predatory thrips, green lacewing larvae and minute pirate bugs. These predators are already present in nurseries and, if protected from insecticides, could maintain low spider mite populations. Predators can be purchased from commercial insectaries and released into mite-prone crops. You should consult your biological control supplier for details on the efficacy of this in your crop conditions.

Chemical control

Although they seem similar, insects and mites have important physiological differences. Thus, you should use insecticides for insects and miticides for mites. Fortunately, many miticides are now available to help manage these stubborn pests. Insecticidal soaps and horticultural oils can also provide control especially if infestations are

noticed early. A comprehensive guide to miticides is available at <http://edis.ifas.ufl.edu/pdf/EP/EP38300.pdf>. Good coverage of interior foliage and the undersides of leaves is essential to mite control, no matter which product you choose.

There are many other spider mite species present in your nursery. Many of these, like the boxwood spider mite, infest a single plant species so the troubles you encounter depend on the crops you grow. However, by scouting and responding early you can stay ahead of the game and reduce mite damage. **NM**

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