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SPIDER MITES AND THEIR CONTROL

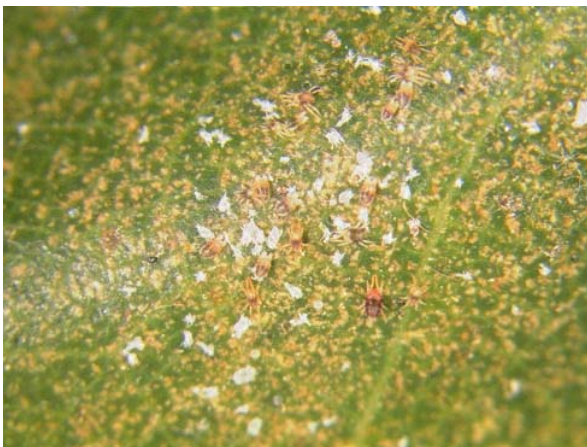
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Spider mites are not insects but are more closely related to spiders. These arachnids have four pairs of legs, no antennae, and a single, oval body region. Most spider mites have the ability to produce a fine silk webbing. Spider mites are very tiny, being less than 1/50 inch (0.4 mm) long when adults.

Many species of spider mites can be found in Ohio landscapes. The twospotted spider mite, *Tetranychus urticae*, and spruce spider mite, *Oligonychus ununguis*, are the most common pests. Other species with fewer host plants include: European red mite, *Panonychus ulmi*, found on apple and serviceberry trees; honeylocust spider mite, *Platytetranychus multidigitali*; southern red mite, *Oligonychus ilicis* (McGregor), on a variety of plants, especially holly; boxwood spider mite, *Eurytetranychus buxi* (Garman); maple spider mite, *Oligonychus aceris*, on red and silver maples; and the oak mite, *Oligonychus bicolor*.



Oak spider mites and cast skins on upper leaf surface.



European red mite damage on serviceberry leaves.

Types of Damage

Spider mites have tiny mouthparts modified for piercing individual plant cells and removing the contents. This results in tiny, yellow or white speckles. When many of these feeding spots occur near each other, the foliage takes on a yellow or bronzed cast. Once the foliage of a plant becomes bronzed, it often drops prematurely.

Heavily infested plants may be discolored, stunted, or even killed. Web-producing spider mites may coat the foliage with the fine silk, which collects dust and looks dirty.

Life Cycles and Habits

Spider mite species seem to be warm weather or cool weather active pests. The twospotted, European red, honeylocust, maple, and oak spider mites do best in dry, hot summer weather. The spruce and southern red spider mites do best in cool spring and fall weather.

All spider mites go through the same stages of development. Adult females usually lay eggs on their host plants. The eggs hatch in days to weeks into the first stage, called a larva. Larvae are round bodied and have only three pairs of legs. The larvae feed for a few days, seek a sheltered spot to rest, and then molt into the first nymphal stage. The first nymph now has four pairs of legs. The first nymphs feed a few days, rest, and molt into the second nymph. The second nymphs feed, rest, and molt into the adult stage. The males are usually the size of the second nymph and have pointed abdomens. The females have rounded abdomens and are the largest mites present.

Most spider mites spend the winter in the egg stage but the twospotted spider mite overwinters as adult females resting in protected places.

Twospotted Spider Mite

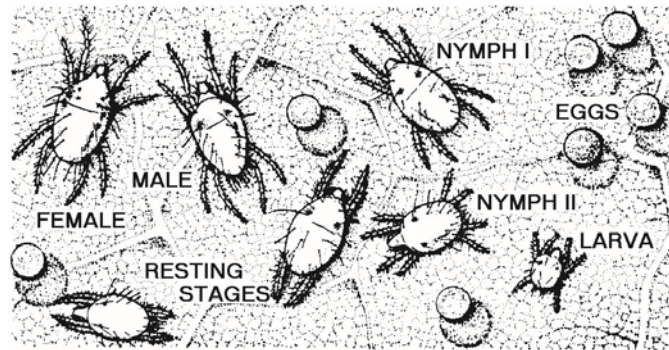
The twospotted spider mite is an example of a "warm season" mite. This pest has been reported from over 180 host plants including field crops, ornamental plants, house plants, and weeds. In Ohio landscapes, this pest is most commonly found damaging winged euonymus and viburnum species, as well as perennial and annual flowers.

The females overwinter in the soil or on host plants. The females become active in April and May when they seek out the undersides of leaves on suitable hosts. Each female may lay over 100 eggs. A single generation may require as much as 20 to as few as five days, depending on the temperature. These mites prefer hot, dry weather and often do not reach damaging populations in cool, rainy periods.

In the summer, the adults and nymphs are white with two greenish spots. However, overwintering females usually turn reddish-orange and can be mistaken for other mite species.



Twospotted spider mite stages on underside of leaf.



The twospotted spider mite life stages (from USDA).

Spruce Spider Mite

The spruce spider mite is a common "cool season" mite. This pest can be found on all types of conifers from spruces and pines to junipers and arborvitae.

This mite spends the winter in the egg stage attached to small branches. The eggs hatch in March through April and the mites can complete development in 3 to 4 weeks. If summer temperatures exceed 86°F for three straight days, the female mites lay dormant, over-summering, eggs. These eggs hatch and the nymphs and adults resume activity in the fall when cooler temperatures return.

Conifers often react slowly to the feeding of this mite. Yellowing and bronzing of the needles may not become apparent until the heat of the summer, even though the damage may have occurred the previous fall and spring.



Spruce spider mite damage; webbing and mites on fir.



Spruce spider mite damage on fir needles.

Control Strategies

Early detection of spider mites, before damage is noticed, is important. The tiny spider mites can be detected by taking a piece of white paper or cardboard and striking some plant foliage over it. The dislodged mites can be seen walking slowly on the paper. If crushed in a streaking motion with your finger, most plant-feeding mites will produce a green streak. If the mites streak yellow or orange, they are likely beneficial predators. If 10 or more spider mites per sample are common, controls are probably needed.

Option 1: Cultural Control—Syringing. Since rainy weather seems to knock off spider mites, using a forceful jet of water from a hose (syringing) can perform the same task. Regular syringing can keep spider mites under control on most ornamental plants in the landscape. This technique also helps conserve natural predators.

Option 2: Cultural Control—Quarantine and Inspection. The twospotted spider mite is often introduced on infested bedding and house plants. When purchasing new plants, carefully inspect the lower leaf surface for any signs of mite activity. New house plants should be quarantined from other plants until you are sure that no mites are present.

Option 3: Biological Control—Predators. There are numerous insects (lacewings and lady beetles) that prey on spider mites. However, the most commonly sold predators are other types of mites. Predatory mites (usually *Phytoseiulus* spp., *Amblyseius* spp., or *Metaseiulus* spp.) can be purchased and released onto infested plants. Be sure to check listings to determine which species is appropriate. Some species are host specific and each predator works better under different weather conditions. If predators are used, avoid applying pesticides that will kill them.

Option 4: Chemical Control—"Soft Pesticides." Most spider mites can be controlled with insecticidal/miticidal oils and soaps. The oils—both horticultural oil and dormant oil—can be used. Horticultural oils can be used on perennial and woody ornamentals during the summer but avoid spraying flowers, which can be damaged. Dormant oils are actually the same as horticultural oils, but they are used to kill mite eggs and dormant adults in the fall and spring. The insecticidal/miticidal soaps are useful in the warm season. Remember that mites are very tiny and soaps and oils work by contact only. Therefore, thorough coverage of the plant upper and lower leaf surface is necessary for good control.

Option 5: Chemical Control—Miticides. Spider mites are usually not killed by regular insecticides, so be sure to check the pesticide label to see if the designation "miticide" is present. Pesticides claiming "for mite suppression" are usually weak miticides and will not perform well or may require repeated applications. At present, there are no true miticides registered for "over-the-counter" (OTC) use, so most home gardeners will have to use insecticidal/miticidal soaps and/or oils. Miticides that do not have "Restricted Use Only" can be purchased by a home owner, but only from professional suppliers and Internet websites, usually in professional quantities. All of these miticides have "For Professional Use Only," which has no legal status for restricting sales. However, miticides that state "Restricted Use Only" require a pesticide applicators license. Non-restricted use miticides are: abamectin (=Avid®), bifenthrin (=Floramite®), hexythiazox (=Hexagon®), Sanmite®, and spiromesifen (=Forbid®). If a miticide has been used correctly and the spider mite population has not been controlled within five to seven days, do not use the same miticide! The mite population may be resistant to the miticide and you should select a miticide with a different mode of action.

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