



BUG BIZ

Pest Management and Insect Identification Series



Tetranychus urticae, Two-spotted Spider Mite (Acarina: Tetranychidae)

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Description

Two-spotted spider mite is a phytophagous species of arachnid and an economically important pest, particularly in high-yielding crops. Two-spotted spider mite exhibits differences of appearance between males and females (sexual dimorphism). It gets its common name from the two dark green or brown spots on the bodies of adult females. These spots represent the intestinal contents, which are visible through the cuticle. In male adults, these spots are much less noticeable. Adults and later stage nymphs possess eight legs, while first stage larvae possess six. These mites spin a common silk web to protect the colony, which may contain thousands of individuals. The silk webbing is often obvious and a telltale sign of spider mite infestation. Adult females are about 1/40 of an inch (0.6 mm) in length, round or oval in shape and pale yellow to greenish in color. Males are smaller and have more tapered abdomens. The straw-colored, spherical, glossy eggs are minute and only visible under a microscope or strong hand lens. The webbing formed by the mite attaches the eggs to the leaf surface and conceals them. The six-legged, colorless larva resembles nymphs and adults, but are smaller.

Two-spotted spider mite is a member of the family Tetranychidae, with more than 1,200 species worldwide. Identification of species in the family is challenging. In cases where the identification of the pest is in doubt, a qualified mite specialist must be consulted.

Life Cycle

Two-spotted spider mite, similar to many other mites, undergo egg, larva, protonymph, deutonymph and adult life cycles. Larvae are six-legged, while the later nymph stages possess eight legs, and differ from the adults in size and sexual status. Two-spotted spider mites thrive in hot, dry weather, preferably between 77 F to 86 F (25 C to 30 C) and low relative humidity. In greenhouses, the life cycle requires seven to 12 days in summer and 12 to 21 days in winter. Completion of the life cycle in laboratory conditions has been documented at seven days at 77 F (27±1 C) and 95±5% relative humidity.



Tetranychus urticae adults (David Cappaert, Bugwood.org, Creative Commons 3.0).



Tetranychus urticae adults, detail (David Cappaert, Bugwood.org, Creative Commons 3.0).



Tetranychus urticae damage on soybean (Whitney Cranshaw, Colorado State University, Bugwood.org).

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Each female produces 15 to 20 eggs per day, for a total of approximately 100 eggs in her lifetime. There is no resting stage in the life cycle. However, an inactive period occurs at the end of each larval and nymphal instar, during which the mite anchors itself and molts to the following stage. Unfertilized eggs develop into males, while fertilized eggs develop into females. The sex ratio can vary significantly, but it typically favors females. Much of the biological research on phytophagous mites, including two-spotted spider mite, was conducted at Louisiana State University by entomologist H. Bruce Boudreaux (1914-1988).

Economic Significance and Pest Status

Leaf tissue injury by mites varies by mite species and their feeding habits. Mites feed by penetrating leaf cell walls with their mouthparts and sucking out the contents. The resulting injury renders the cells inviable, and they no longer contribute to plant growth and development. Two-spotted spider mite affects a variety of vegetables (tomato, cucurbits, peppers, snap beans and strawberries) and ornamentals (roses, carnations, cyclamens, gerbera, etc.), including indoor and green house plants. The mites feed on the leaf parenchyma, causing spots that detract from the pristine appearance required of quality ornamentals and reducing market value for vegetables. Losses from mite feeding are more severe in greenhouse grown crops sold for fruits or flowers are sold and not foliage, where only the photosynthetic function of the leaves is concerned. Lack of control can result in rapid spread of infestations and potential yield loss or loss of plants.

Management

Cultural control. Sanitation and visual inspection of plant material before introduction to greenhouses and other susceptible cropping systems is critical. Cultural control management includes crop rotation, clean fallowing, weed control, mixed cropping, trap or border crops, changes in tillage practices and minimizing dusty surroundings that favor mites.

Biological control. Biological controls include supporting healthy populations of predatory arthropods help keep mite populations at bay. Predatory mites are some of the most effective natural controls, including *Phytoseiulus persimilis* and *Neoseiulus cucumeris* (Acarina: Phytoseiidae), all of which feed on spider mites. Other predators include green lacewings (Neuroptera: Chrysopidae), small species of ladybird beetles (Coccinellidae: Scymninae), minute pirate



Tetranychus urticae damage on bell pepper (O.P. Sharma, Bugwood.org, Creative Commons 3.0).

bugs (Hemiptera: Anthocoridae) and predatory thrips (Thysanoptera: Aelothripidae). These natural enemies occur frequently in nature, but they do not always keep mite populations from reaching damaging populations.

Chemical control. Mites can be difficult to control with pesticides due to their short life cycles and resistance. Miticides can be used if pest pressure develops beyond economic thresholds. Some of the best common acaricides listed for control of mites on vegetable and orchard plants are dicofol, insecticidal soaps, malathion, pyrethrins, rotenone and sulfur. Check the label to ensure that mites and the name of the host plant are listed before any pesticide. Refer to the LSU Agricultural Center's most recent Pest Management Guide, published annually, for the latest recommendations for control of two-spotted spider mite.

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