

Twospotted Spider Mite and its Management

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The twospotted spider mite, *Tetranychus urticae*, is extremely difficult to detect and manage because of its small size, cryptic habits of feeding on the underside of leaves, and short life cycle. A successful management program begins with early detection of an infestation and correct identification of the life stage.

IDENTIFICATION AND BIOLOGY

The twospotted spider mite is characterized by two dark spots on the body. All life stages can be found on the underside of leaves. The eggs are spherical and clear when first produced, then becoming whitish as they mature. A hatchling is called a larva and has three pairs of legs. The next two nymphal instars (protonymph and deutonymph) are larger and have four pairs of legs. Development is completed in 7-14 days, and accelerates in a hot and dry environment. Each female lives for about 30 days and produces 60-100 eggs.

Spider mites feed by puncturing the cell wall and removing cell content. Typical symptoms of spider mite infestation include leaf bleaching, and stippling and bronzing, which can be used for scouting. When webbing begins to cover



parts of plants, heavily infested plants should be discarded, and the remaining crops should be treated.

MANAGEMENT OPTIONS

Scouting. A scout should observe (using a hand lens) for feeding damage, such as stippling and webbing, on randomly selected plants. Alternatively, place a sheet of white paper on a clipboard or a white paint palette under the leaves or branches and strike them sharply, and look for mites moving on the surface.



Cultural Control. The efficacy of various cultural control tactics is rarely documented. Healthy and well-maintained plants are more tolerant of mite damage. Spider mite outbreaks are associated with dusty conditions; therefore, regular sprays of water on paths may keep down the dust, whereas spray of water on the foliage may dislodge spider mites.

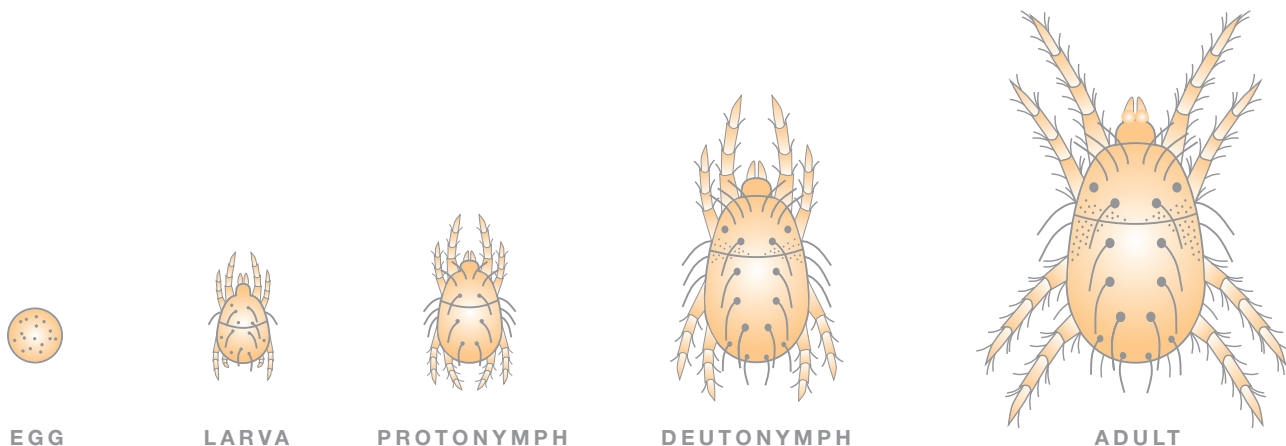
Biological Control. In nurseries and greenhouses, natural enemies may be purchased and introduced. In outdoor productions, creating favorable conditions (such as cover crops) for the natural enemies may be more cost effective and efficient than releasing natural enemies purchased commercially. It is important to understand that predatory in-

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sects and mites are living creatures; hence, they also have very specific environmental requirements to perform optimally. Consult with your biological control agent suppliers or local extension personnel to develop a biological control program.

Biological control is most effective as a preventive management tool. When plants are heavily infested, 1-2 applications of compatible miticides may be needed to reduce the mite population before releasing the predatory insects and mites.

If another pest (such as thrips) infest the same crop and another pesticide application is needed, carefully study the compatibility of the pesticides with the natural enemies before application. Avoid using organophosphates, carbamates and pyrethroids, which are known to be extremely harmful to the natural enemies.

Selecting the Most Appropriate Miticides. A large number of translaminar and contact miticides are registered for nurseries and greenhouses. Contact miticides, such as cyflumetofen (Sultan) and bifenazate (Floramite), kill mites through direct contact or residue. Some miticides, such as abamectin (Avid) and chlorfenapyr (Pylon), have both contact and translaminar properties. The active ingredients of translaminar miticides are capable of penetrating the leaf cuticle into the mesophyll and palisade parenchyma cells, and kill spider mites feeding on the underside of leaves. Although translaminar miticides are more forgiving when spray coverage is less than optimal, it is still a good idea to achieve complete coverage. The reported maximum residual period of most miticides is 28 days, but re-applications may be needed in 14 days because of

degradation of miticide residue and growth of new, unprotected tissues. Each miticide has its own spectrum of effective life stages; therefore, it is important to determine the predominant life stages of the mite population before the application. A miticide, or a tank mix of two products, that provides activity against all life stages may be needed.

Rotation, rotation, rotation! The short life cycle and high reproductive capability of mites make them perfect candidates to develop miticide resistance. To delay the development of miticide resistance, practice IPM, only spray when you have to, and always rotate among miticides of different modes of action. Always check labels for target species, rates, application instructions, maximum number of application, and sensitive plants.

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