Two-Spotted Spider Mite on Vegetables

The two-spotted spider mite is a common problem in high tunnels and greenhouses but can also be problematic in vegetables grown in the field during seasons with extended periods of hot, dry weather.

Figure 1. Two-spotted spider mite adults and eggs. Photo: David Cappaert, Michigan State University, Bugwood.org

Host Plants

The two-spotted spider mite (TSSM) feed on a wide variety of vegetables, some of which include: tomato, sweet corn, eggplant, bean, pepper, and cucurbits. In addition, these spider mites will also attack tree fruit, small fruit, agronomic crops, ornamentals, and weeds.

Life Stages and Description

TSSM has 4 life stages - egg, larva, nymph, and adult.

- Eggs are laid singly on the undersides of leaves and look like tiny round balls which appear translucent-yellow in coloration.
- Larvae have 6 legs, are colorless to light yellow with red eyes, rounded bodies and are about the size of eggs.
- Nymphs vary in coloration from light yellow-greenish-reddish orange, have 2 dark, dorsal spots but are smaller than adults.
- Adults are similar in coloration to nymphs and also have 2 dark, dorsal spots. Adult females are oval-shaped and about 0.03- inch- long while the slightly smaller males have pointed abdomens (Figure 1). Females can lay 100 eggs or more, and development from egg-adult takes 5-19 days depending on the temperature. Under optimum environmental conditions (i.e., high temperature and low humidity), the life cycle from egg to adult may be completed in 7 days or less. There are multiple, overlapping generations of TSSM in a season.

Plant Injury

TSSM feed mainly on the undersides of leaves. Spider mites puncture leaf tissue and extract chlorophyll and plant sap from cells causing white-yellowish, pinpoint dots (stippling/speckling) on the upper leaf surface (Figures 2 & 3). Extensive feeding by high populations of mites can cause yellowing and browning of leaves, premature leaf drop, and a reduction in plant vigor.

Figure 2. White speckling (stippling) caused by two-spotted spider mites on the upper surface of tomato leaf. Photo: Andy Muza, Penn State
Early detection of mite populations is important since initial spider mite infestations can be spotty/localized. Frequent scouting, especially during hot, dry conditions, is recommended. Initially, scouting should be focused on the borders of vegetable fields. Check on the undersides of leaves, especially those with any stippling injury, using a 10-20X hand lens to observe the presence of TSSM. If heavy infestations are occurring, then webbing on the leaves may also be noticeable. If the presence of mites is observed on the border rows of the field, ten random locations in the interior portions of the field should also be checked for TSSM infestations. Another option for mite detection while scouting is to hold a white sheet of paper under leaves while tapping the leaves to dislodge any mites onto the paper.

Management

Plant health
Healthy plants can tolerate higher levels of mite feeding compared to stressed plants. Therefore, proper nutrient management and timely irrigation to reduce plant stress are beneficial. However, avoid excessive nitrogen, which can increase mite populations.

Weeds
Early and routine management of weeds/grassy areas around and within fields is important to prevent a buildup of mite populations on surrounding vegetation. However, if weeds around fields are not properly managed and already have TSSM, then avoid mowing these areas after midsummer. Mowing weedy areas containing mites may cause the migration of these pests into adjacent vegetable fields.

Beneficial mites and insects
Natural enemies of mites (e.g., predatory mites, lady beetles, minute pirate bugs, predatory thrips, etc.) play a major role in managing mite populations. However, broad-spectrum insecticides, such as pyrethroids, can severely reduce these natural enemies causing mite outbreaks. Avoid over-reliance on broad-spectrum insecticides and, when possible, use insecticides that have the least impact on beneficial insects.

Miticide options and application
There are a variety of miticides labeled for vegetable production. However, the labeled miticides will vary depending on the vegetable crop being produced. Therefore, consult the latest edition of the Mid-Atlantic Commercial Vegetable Production Recommendations for miticides approved for specific crops.

If scouting efforts detect spotty/localized mite populations then spot spraying areas may be effective before mites spread throughout the field. If spot spraying is conducted, then treat a buffer zone of at least 100 feet beyond the mite infested area. Whether spot spraying or treating the entire field, good coverage of both lower and upper leaves is essential. Since miticides differ in their effectiveness against varying life stages of the TSSM, a second application may be needed about 7 days later, depending on the miticide used.

Be aware that some miticides may be toxic to bees and/or predatory mites and beneficial insects. Consult the miticide labels for targeted life stages, product rates, application information, and restrictions. Also, as a resistance management strategy, rotate miticides among mode of action group numbers.

Authors

Andrew Muza
Extension Educator
ajm4@psu.edu
814-240-0979

extension.psu.edu

Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Extension is implied.

This publication is available in alternative media on request.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability, or protected veteran status.

© The Pennsylvania State University 2022

Code: ART-7266