GROWERTALKS

Columns

5/27/2016

Stopping the Summer Spider Mite Surge

Virginia Brubaker

There's a lot to like about summer—vacations, cookouts, Frisbees and all kinds of outdoor activities. Unfortunately, spider mites find a lot to like about summer, too. Abundant foliage combined with hot, dry weather shifts their reproductive capacity into overdrive. As the temperature goes up, the length of the spider mites' life cycle goes down, leading to population explosions.

Spider mites have flexed their muscles in recent years by demonstrating their ability to fend off most registered miticides through pesticide resistance. Pesticide resistance has become a major issue for the greenhouse industry and it's forcing a change in pest control strategies.

We know of several ways in which populations of organisms develop resistance to pesticides and probably more ways are yet to be uncovered. Some contain proteins that bind up pesticides; others use enzymes to detoxify them. Genetic variation within a population makes it possible that a few individuals in any given population may contain the needed attributes to start the process toward resistance. Whenever we treat a pest population with a pesticide, there's a chance that a few of the pests contain some ability to deal with the given treatment. If they survive with a few others that have a similar ability to cope, we have the beginnings of a breeding group that may lead to resistance over time.

Growers love systemic pesticides with long residual control and why not? The longer the period of control, the less we need to spray. While this is true, as the amount of chemical slowly reduces in the plant tissue, it eventually falls to a level that's sub-lethal to the target pest. The end result is an extended period of time when pests are subject to less than a full dose of the pesticide. Pests with some degree of built-in genetic resistance may survive contact with the reduced level of pesticide and breed with others that have the same. Using lower than the label rate leaves open the possibility of exposing part of the population to a sub-lethal dose. This can encourage resistance and isn't recommended.

Early detection for mites is a must, enabling control to be implemented before serious crop damage is observed. Early detection also facilitates the use of biological control agents (BCAs) or softer pesticides. Concentrate scouting efforts on those crops known to be particularly vulnerable to spider mites. Some growers have planted a few bush bean plants to act as trap crops—the proverbial canary in the coal mine. Spider mites thrive in lower humidity, so pay special attention to areas in the greenhouse with lots of air movement, such as near intake louvers and doors.

Spider mites are small enough that magnification is needed for effective scouting. Tapping plant leaves and stems onto white paper is one way to scout for spider mites. Spider mites feed on lower leaf surfaces, removing chlorophyll from a cluster of cells and causing small tan or bronze spots to appear on upper leaf surfaces. Heavy feeding can cause a bronzing of the entire leaf and may progress to defoliation. Webbing is sometimes seen, but by the time that occurs, it's generally too late to save affected plants.

Crop nutrition plays a role in spider mite development as well. Entomologist Dr. Raymond Cloyd from Kansas State University has mentioned in various publications a link between high nitrogen levels and increased spider mite populations. Most plants will tolerate more nitrogen than they actually need, so work towards only fertilizing as much as is necessary for optimum growth.

Several BCAs are effective against spider mites; each one has attributes that may make it the best choice in one situation or another. Some considerations include the crop to be protected, time of year and other pests that need to be controlled at the same time.

An option for active spider mite populations is the aggressive predatory mite Phytoseiulus persimilis, sold as Phytoline p. P. persimilis only feed on spider mites, so they're not used preventatively. They're most successful when temperatures are 65F (18C) or higher, humidity is fairly high and they're patrolling smooth-leaved plants. Plan to release Phytoline p on a weekly basis until control is achieved. Flats or plants need to be touching for mites to spread from plant to plant.

If spider mite populations are known to occur in predictable patterns, you could choose to release Amblyseius andersoni or Amblyseius californicus in advance of the populations. However, if scouting is strong, Phytoline p can be used to control on a see-and-treat basis. For preventive releases, A. andersoni are best utilized during cooler conditions in spring and fall, feeding on eggs, immature and adult stages. For warmer, summer conditions, switch to A. californicus.

Pesticides already applied to the crop may leave behind harmful residues that can damage predators for weeks or even months. Unless you're experienced in using BCAs, we suggest consulting with your supplier to help you start and maintain a biocontrol program. We believe that biological controls are an important part of the way forward as the industry comes to grips with fewer effective pesticides.

Horticultural oils such as Suffoil-X or Ultra-Pure Oil can be important allies in combating spider mites. While resistance isn't currently a problem, some challenges are associated with using the oils. They work by suffocating mites, so thorough coverage is essential for success. Even with the best sprayers, that can be a challenge in dense crop canopies. Plant safety can also be a problem. To minimize this concern, apply horticultural oils when rapid drying will occur and temperatures are below 85F (29C). Control is achieved quickly after spraying, so prolonged foliage wetting isn't needed for good results.

Many different miticides are labeled for controlling spider mites in greenhouses, representing several modes of action. While that sounds like good news, resistance is widespread and can vary from one colony of spider mites to the next. Listed in the sidebar are examples of labeled miticides organized by mode of action. Always read and follow the entire pesticide label. Not all pesticides are labeled for use in every state.

Pesticides other than those listed here may also be safe and effective. All materials listed, except for Kontos, are applied as foliar applications. **GT**

> **Contact activity:** MOA UN: Floramite*, MOA 20B: Shuttle, MOA 21A: Sanmite, Magnus, Akari*, MOA 25: Sultan, NC: Horticultural Oils – Ultra-Pure* and Suffoil-X*, 10A: Hexygon
>
> **Translaminar systemics:** MOA 13: Pylon*, MOA 23: Judo, Kontos*, MOA 10B: Tetrasan, Beethoven TR, MOA 6: Avid, MOA UN + 6: Sirocco
> * Indicates at least one edible crop is listed.
> Check label for details.

Virginia Brubaker is GGSPro Technical Support Supervisor for Griffin Greenhouse Supplies. She can be reached at ggsprotech@griffinmail.com.