



Dan Gilrein
dog1@cornell.edu

Fight Mites Right

"I hope enough has now been adduced to show that the study of Entomology should not, by any reflective mind, be regarded as frivolous or degrading...."

- Robert Patterson, *Letters on the Natural History of the Insects Mentioned in Shakspeare's Plays*, 1838

I've worked with growers and landscape professionals over thirty-five years on many interesting, challenging, and sometimes distressing cases, identifying the pest, history, and sources of an infestation while assessing and planning - and following up on - strategies to overcome and move on. Many of these involve already rampant pest populations where they are not getting the expected level of control. I should note while pesticide resistance is often automatically assumed it's rarely involved. An exception in one greenhouse involved 'pepper thrips,' *Thrips parvispinus*, introduced on plants to the range, where it was clear insecticide resistance was a factor with a pest known for it. Thanks to work by Dr. Alexandra Revynthi at Univ. of Florida and Dr. Sarah Jandricic of Canada's OMAFRA we quickly made more effective insecticide choices in a rotation that fairly quickly brought things under control. We followed up with the grower, after each application, to assure results were as expected.



Twospotted spider mite typical stippling damage to mini-rose.

More recently I've worked with another grower on a tough twospotted spider mite problem. The mite population has a long history of exposure to a few selective miticides

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that were no longer working well or at all - and resistance is strongly suspected in this case. While there is interest in biocontrols the situation we felt was beyond that for the time being. After suggesting some products with novel modes of action not previously used we saw some improvement, though still not where things needed to be as we headed into warm and dry summer conditions ideal for mites. We decided on a régime of several regular (weekly or so) 1% horticultural oil sprays to control both active mites and eggs, watching to make sure plants were tolerant and then inspecting samples afterwards to confirm results. There's a chance that susceptibility to miticides used previously will reappear once the pressure is removed and we're not aware of any resistance in twospotted spider mite to paraffinic horticultural oil. Examining leaves under magnification afterwards it was obvious many, if not all, mites and eggs were killed by the oil treatment. As oil works almost entirely on contact stratified leaf samples - some taken from low in the canopy, some from areas where spray coverage was thought excellent and other leaves from parts more difficult to treat - helped show where spray coverage was good or needed attention. More effort was directed towards the latter by thinning/removing old lower leaves (which also took out some of the mite population), spacing plants, directing spray application from multiple sides, and rotating plants in place between applications. Sometimes adjusting nozzle type and pressure can help too. Repeat applications also address less-than-perfect coverage to some extent and we were pleased to see the plants, which were not blooming (sensitive) stage, continued to be quite tolerant of the oil applications. As we head into fall most of what remains of the crop are stock plants, where there is greater tolerance for phytotoxicity should



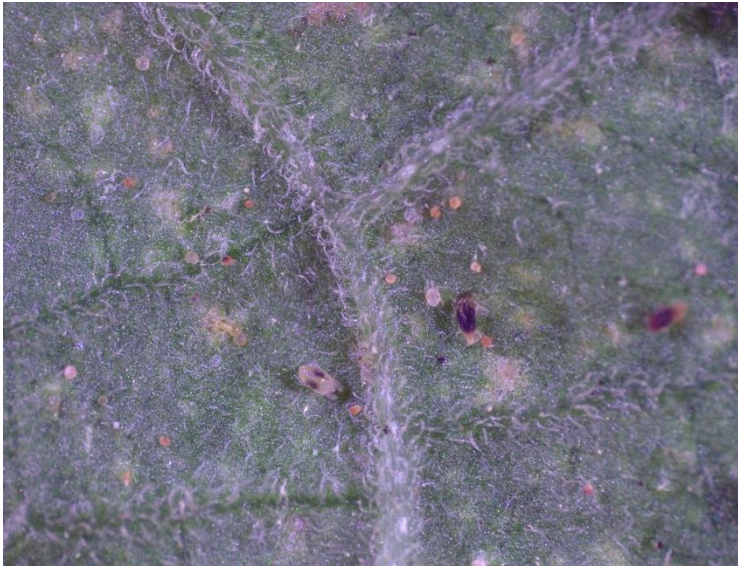
Twospotted spider mite and thousands of their tiny eggs under leaflet of mini-rose - a population poised to 'explode.'



Very high population of twospotted spider mites on Ipomoea - webbing is often produced by the mites at such levels.



Photo shows an adult spider mite killed by horticultural oil (larger dark object right of center), a healthy spider mite (upper left), a mite egg killed by oil (brownish tiny shriveled object in dead center) and healthy egg (to upper right of that).



Over a dozen shriveled brown mite eggs killed by horticultural oil are visible in this photo. The larger dark object right of center is a mite killed by oil; a live healthy spider mite is center left side of the leaf vein.



A beneficial predator mite stands guard over two spider mite eggs it may devour.

that start to appear, and our goal is to see plants clean as possible while cuttings are taken and beyond into the next cycle.

Propagation is now getting underway; in prior work we found Lewis mites surviving on poinsettia leaves through propagation even under regular mist and expected twospotted mites could do the same, so cutting dip treatment is planned. We had a preliminary discussion concerning handling and what to do with the leftover miticide (it will be filtered and sprayed out on certain crop plants thoughtfully selected for the purpose). We'll be checking plants during propagation and other plants in the range to be sure the new crop is starting clean in an environment relatively free of sources of infestation. Weed control around the outside of the house is very good as well: during a cold February foray around our own research greenhouse we easily found twospotted mites overwintering on the undersides of some broadleaf weeds. Mites can blow in from further away but we don't want to make it any easier for them.

With the situation looking much better at this stage - much lower mite populations and more favorable environmental conditions (lower temperatures) ahead - we're discussing plans to incorporate mite predators (*P. persimilis*) and selective compatible miticides while continuing to regularly inspect plant samples to confirm where we stand with mites and predators or make adjustments where needed. I've also suggested having a stereoscope or USB-type microscope to do their own inspections in house.

Most of the time such an intensive approach isn't practical or possible - or needed, but with long-term crops (e. g. foliage plants) in continuous production, control 'failures' and pests like mites and western flower thrips possessing wide host ranges and notorious reputations for pesticide resistance it's all about getting lasting good results, restoring confidence, and - most important - staying in business.

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CONTRIBUTORS

Dr. Nora Catlin
Floriculture Specialist
Cornell Cooperative Extension
Suffolk County
nora.catlin@cornell.edu

Dr. Chris Currey
Assistant Professor of Floriculture
Iowa State University
ccurrey@iastate.edu

Dr. Ryan Dickson
Greenhouse Horticulture and
Controlled-Environment Agriculture
University of Arkansas
ryand@uark.edu

Dan Gilrein
Entomology Specialist
Cornell Cooperative Extension
Suffolk County
dog1@cornell.edu

Dr. Chieri Kubota
Controlled Environments Agriculture
The Ohio State University
kubota.10@osu.edu

Heidi Lindberg
Floriculture Extension Educator
Michigan State University
wollage@anr.msu.edu

Dr. Roberto Lopez
Floriculture Extension & Research
Michigan State University
rllopez@msu.edu

Dr. Neil Mattson
Greenhouse Research & Extension
Cornell University
neil.mattson@cornell.edu

Dr. W. Garrett Owen
Sustainable Greenhouse & Nursery
Systems Extension & Research
The Ohio State University
owen.367@osu.edu

Dr. Rosa E. Raudales
Greenhouse Extension Specialist
University of Connecticut
rosa.raudales@uconn.edu

Dr. Alicia Rihn
Agricultural & Resource Economics
University of Tennessee-Knoxville
arihn@utk.edu

Dr. Debalina Saha
Horticulture Weed Science
Michigan State University
sahadeb2@msu.edu

Dr. Beth Scheckelhoff
Extension Educator - Greenhouse Systems
The Ohio State University
scheckelhoff.11@osu.edu

Dr. Ariana Torres-Bravo
Horticulture/ Ag. Economics
Purdue University
torres2@purdue.edu

Dr. Brian Whipker
Floriculture Extension & Research
NC State University
bwhipker@ncsu.edu

Dr. Jean Williams-Woodward
Extension Plant Pathologist
University of Wyoming
jwilwood@uwyo.edu

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