

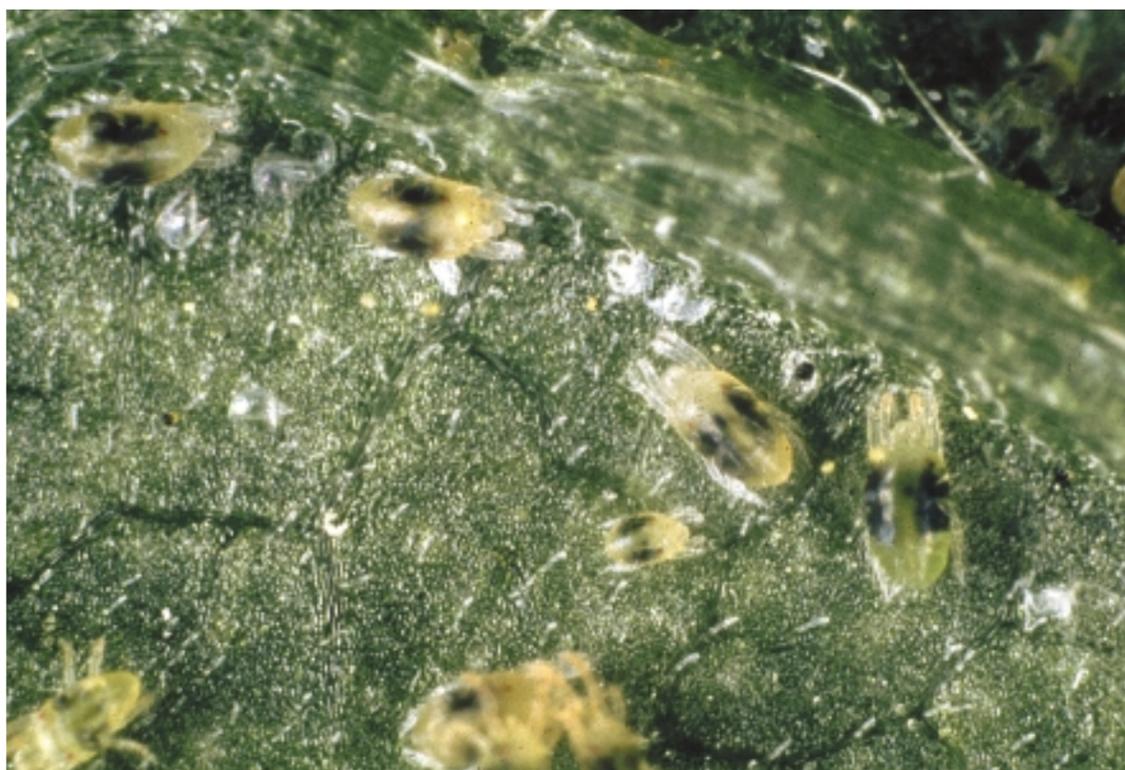


# Managing Spider Mites:

## *The New and the Old*

Spider mites have been around for a long time, and so have some of the treatments for them. Lately, improved application methods and new chemicals have brought this pesky group back into the spotlight.

By Richard K. Lindquist



Don't let this close up fool you; two-spotted spider mites can bring a lot more trouble than their appearance suggests. (All photos courtesy of Richard Lindquist)

**T**here is both good and bad news in spider mite management. If you are like me, you prefer to get the bad news out of the way first. If you would like to read the good news first, skip the first three paragraphs and read them later, when you can handle it.

The heart of the bad news is that spider mites are still here, which I suppose does not really qualify as news (but if you watch your local TV "news" you're accustomed to non-news). Yes, indeed, spider mites are around, infesting and damaging numerous crops this year, despite the best efforts of those in charge of getting rid of them.

The two-spotted spider mite, *Tetranychus urticae* Koch, is the species dealt with most often, but there are other spider mites as well. The Lewis spider mite, *Eotetranychus lewisi*, a slightly smaller version of the two-spotted mite, can infest poinsettias ("real" spider mites can infest poinsettias as well). If the infestation is not detected soon enough, a lot of leaf drop can occur. Most spider mites do best at warmer temperatures, though the spruce spider mite, *Oligonychus ununguis* (say that

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rapidly about 25 times), is one that causes more problems at cooler temperatures. Spruce spider mites are not normally problems in greenhouses but can be in outdoor production.

Information on spider mite biology can be found in numerous publications, so I will not go into detail here. At warmer temperatures, two-spotted and Lewis spider mites have a

*Lewis mites and webbing damage on poinsettia.*



faster generation time, and — just to make things fun — they are very small and usually found on leaf undersides. The occurrence of mites on leaf undersides has significant effects on detection and pesticide application (i.e., they're hard to see and difficult to reach with pesticide sprays).

So, what's the good news? The good news in

spider mite management is that there are now many products registered for use on greenhouse and nursery ornamentals — there are both old and new products, with more to come. It's a good thing, as Martha Stewart might say, that we have a fairly large number of products to use against spider mites (as well as other mites), because labels on some products restrict the number of applications. More on this later. The current listing of products registered for mite control is shown below in Table 1. Many other pesticides list spider mites on their labels, but only those products that have mites among the primary pests controlled are included in the table.

### SELECTING PRODUCTS TO USE IN A ROTATION

The bad news about having so many products — yes, the fun just keeps coming — is that it is often difficult to decide which product to use in each situation. I've come up with a list of questions that will at least help you narrow the field.

**Is the product registered for use on the site it's to be applied?** All of the products listed in the chart are registered for use on greenhouse ornamentals, but not all are registered for use outdoors. Akari and Pylon are labeled for greenhouse crops only. If REI (restricted entry interval) is important — and it is for most growers — the only product with a very long REI (48 hours) and a restricted-use label is Vendex. All of the others have either a 4- or 12-hour REI.

**How soon can results be seen?** Products vary in their speed of activity against mites. Those with the most rapid activity (i.e., those ▶

Table 1. Products registered for spider mite (and other mite) control

Trade Name	Common name	Company	Chemical Class*	REI (Hrs)	Mites Controlled**
Akari	fenpyroximate	SePro	phenoxy pyrazole	12	SM
Avid	abamectin	Syngenta	glycoside	12	SM, BRM, CYM, ERM, RM
Cinnamite	cinnamaldehyde	Whitmire	oil	4	"Mites"
Floramite	bifenazate	Uniroyal	carbazate	4	SM, ERM, CRM, SRM
Hexygon	hexythiazox	Gowan	thiazolidinone	12	SM, ERM, CRM, SRM
Kelthane	dicofol	Dow Agro	organochlorine	12	SM, BRM, CYM, RM
Ovation	clofentezine	Scotts	tetrazine	12	SM, ERM
Pylon	chlorfenapyr	Olympic	pyrrole	12	SM, BRM, CYM, RM
Sanmite	pyridaben	Scotts	pyridazinone	12	SM, BRM, SRM, TUM
Triact 70	neem oil	Olympic	oil	4	"Mites"
Ultra-fine Oil	paraffinic oil	Whitmire	oil	4	SM
Vendex	fenbutatin-oxide	Griffin L.L.C	organotin	48	SM

\*Products in different chemical classes may have the same (or similar) mode of action (e.g., Akari and Sanmite, Pylon and Vendex). Products with the same mode of action should not be applied in consecutive applications.

\*\*BRM = broad mite; CRM = citrus red mite; CYM = cyclamen mite; ERM = European red mite; RM = rust mite; SRM = southern red mite; SSM = spruce spider mite; SM = spider mites; TUM = tumid mites.

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that provide the satisfaction of seeing dead mites) are the oil products Cinnamite, Triact 70 and Ultra-Fine Oil (1 day); followed by Avid, Floramite, Kelthane and Pylon (1-3 days); followed by Akari, Sanmite and Vendex (4-7 days); followed by Hexygon and Ovation. Akari, Sanmite and Vendex stop mite feeding fairly quickly, but mite death may not occur for several days. Hexygon and Ovation affect mostly eggs and young larvae, so you may never see any dead mites — just fewer mites and less damage.

**What about coverage?** How does the product get to where it needs to go? Avid and Pylon are the only products on the chart that have translaminar activity (move from upper to lower leaf surface), which may improve control on crops where coverage of leaf undersides is difficult. Although coverage is important with all pesticides, it is especially important to obtain good coverage on leaf undersides when applying products without translaminar activity in order to obtain the best control possible.

**What mite development stages are affected?** Two products, Hexygon and Ovation, are directly effective only against eggs and very young larvae. If there is already a full-blown mite infestation when beginning a management program, it will be necessary to use these products in a tank mix with a product that controls nymphs and adults. Akari and Sanmite are most effective against larvae and nymphs and less effective on adults. The other products will kill all but the egg stage.

**How long will control last?** Some of the listed products cite fairly long-term residual activity, ranging from 14-28 days or more. Remember that this residual activity is on areas of the plants covered when applications were made. If all goes well, the plants will continue growing after the application. Because we do not have any systemic mite-killers (translaminar, yes, but this is not systemic activity), the new growth will not be protected. Also, since it is unlikely that 100 percent of the mites will be killed with the first application, and spider mite females tend to move up the plant to form new colonies, residual activity may be less important than stated in the products' technical literature. The good news here is that subsequent applications can be directed mainly at the new growth.

**How soon can I get workers back into the treated area?** Many of the products have an REI as low as four hours. The only "conventional" product included here is Floramite. The others are oils. All but one of the rest have 12-hour REIs — still not too bad. Vendex is the one product with a very long REI (48 hours), reducing its ease of use in many cases.

**What's the fine print?** Most of the listed products have restrictions on the number of consecutive applications, and number of applications per crop or per year. This is for pesticide resistance management and can make

*Spider mite webbing and feeding injury on marigold.*



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*Heavy Lewis mite infestation on poinsettias.*



planning a rotation program a bit complicated — especially if temperatures are high and mites are on the loose. The most restrictive labels are Hexygon and Ovation (one application per crop cycle, or one application per year on long-term crops), but many of the other chemicals also restrict the number of applications. Kelthane, Floramite and Akari labels restrict the number of applications to two per crop cycle, or year. Further, Akari and Floramite should not be applied twice in succession. Are you following this so far? Pylon can be applied twice in succession, but no more than three times per crop cycle AND not to consecutive crops in the same greenhouse. The Avid label states not to apply successive applications to more than one pest generation — which during warm conditions could be only one application. The Sanmite label says no successive applications but does not indicate a maximum number of applications per crop cycle.

With all of the above restrictions, it's a good thing that there are quite a few products available. Growers should use at least three products in different classes/modes of action, plus an oil product (Cinnamite, Triact 70 or Ultra-Fine Oil) to develop a proper rotation for pesticide resistance management.

### THE BOTTOM LINE

Lewis and two-spotted spider mites will develop faster at warm temperatures and spray schedules must be adjusted accordingly. Follow a proactive management program involving frequent plant inspections. Mites will not be caught on sticky traps unless they start throwing themselves off plants because of overcrowding — and the infestation probably will be noticed before then.

Make sure to get good spray coverage on leaf undersides. Some products may need a wetting agent to be very effective on certain plants. Unless you know the combination is safe with another type, use a nonionic surfactant.

Watch the spray water pH and alkalinity. Avoid using water (containing the pesticide) with a pH above 7.0. If necessary, you should adjust the pH to 6.0-6.5 before mixing and spraying.

The best times to spray are when temperatures are between 65 and 85° F; mites are active and the pesticides will have time to spread and adhere to or move into the plant. Do not overhead water for about four hours following an application. And the last bit of advice: make sure that the spray tank and hoses have been cleaned and rinsed before every application. GPN

*Richard Lindquist is senior technical manager with Olypic Horticultural Products. He can be reached via phone at (330) 345-5570 or E-mail at [rlindquist@olympichort.com](mailto:rlindquist@olympichort.com).*

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