

SPIDER MITES OR "RED SPIDERS"¹

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There are several interesting points about the biology and chemical control of greenhouse "red spiders" which may be useful to the commercial greenhouse operator.

There are as many as six species of these mites that attack greenhouse plants. The two-spotted spider mite is a very serious pest of roses but may also cause considerable damage to a number of other commercial greenhouse crops. They feed predominantly on the under side of leaves. These remarks are chiefly concerned with the two-spotted spider mite.

Two-spotted mites are generally yellowish-brown or greenish in color but have dark spots on them. Some females and a few strains are quite red in color. The females are about 1/60th of an inch long and larger than the males. The rapidity of development of the mites is very temperature dependent. This has been illustrated by several workers in the following way. One female spider mite can give rise to the following numbers of mites in one month at these three temperatures:

60° F.	-----	20
70° F.	-----	13,000
80° F.	-----	13,000,000

At an average temperature of 60-70° F. the development from egg to adult is from 10 to 15 days. This time for development is reduced to five days at 75° F. This should give an idea of how serious the situation can become at warmer temperatures.

Since there are many miticides or "mite-killers" on the market for control of the two-spotted spider mite, it is interesting and informative to study the comparative effectiveness of some of the chemicals, especially since they differ on different stages of the mites.

From Table 1 we can see striking differences such as the potent egg-killing ability of Ovotran in contrast to its effect on adults and the opposite though less striking relationship with Aramite. Chlorobenzilate is more consistent in its effect on all stages.

Several other important features are not brought out in the table. For example, the emulsions are, in general, somewhat more effective than wettable powders, especially against the egg stage. However, these tests do not involve comparisons of residual effect. If tested over a week's period the difference between formulations would not be expected to be great. Furthermore, some of the miticides may show up better under such tests. An additional point involves the mite kill on the opposite or unsprayed side of the leaf. The materials best in this respect are Demeton, parathion and DMC; malathion is quite poor in this respect. Types of foliage will affect penetration, of course, and the age of leaves treated will have some influence on effectiveness. Leaf age also modifies the habits of the mites. When mites are resistant to a phosphate insecticide such resistance may be partially shown by other chemically related phosphates; generally such a carry-over in resistance is not evident in non-phosphorous compounds.

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Table 1

The comparative toxicity of several miticides to the egg stages, larval stages (newly hatched) and adult stages of the two-spotted spider mites. Eggs were sprayed directly but active stages were tested by permitting them to crawl on sprayed leaves for 48 hours (adults) or 48-72 hours (larvae). The symbols VG = very good; G = good, requiring a dose 2-5 times higher; M = moderately effective, requiring 6-20 times higher dose than very good; P = poor or ineffective requiring more than 20 x the very good dose; and - = data is not available at present time. (Values adapted from research of Ebeling and Pence, U.C.L.A.)

Non-phosphates	Wettable Powders			Emulsions		
	Eggs	Larvae	Adults	Eggs	Larvae	Adults
Aramite	G	VG	VG	G	G	VG
Chlorobenzilate	VG	G	G	VG	G	G-M
DMC (Dimite)	-	-	-	VG	M	M
Ovotran	VG	G	P	VG	M	P
Sulphenone	M	P	P	G	P	P
<u>Phosphates</u>						
Demeton ¹	-	-	-	VG	VG	VG
Diazinon	VG	G	G	-	-	-
Malathion	M	VG	VG	G	G	VG
Parathion	G	VG	VG	G	G	G

¹Demeton or Systox, a systemically active material

This information on biology and comparative miticide effectiveness on different stages of spider mites should give you a greater appreciation of problems associated with this important greenhouse pest. Perhaps you can find some clues which will help you to interpret your problems and improve your control measures.