

PRELIMINARY RESEARCH ON K6451

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Since the introduction of Parathion one year ago, greenhouse operators have been demonstrating increasing dependence upon this material in their insect control program. To the rose grower, Parathion applied in aerosol form has proved to be a tremendous boon as control measure for the two-spotted mite, commonly known as "red spider," and other pests. Yet in the face of the splendid results achieved with Parathion aerosols, several problems have arisen in connection with the use of the compound. Mites resistant to Parathion occurring on roses in several known instances, an increase in the number of "bull-headed" roses probably bearing some relationship to the use of Parathion, an occasional leaf drop arising when Parathion aerosols have been employed after sulfur application, and the possibility of Parathion injury to the foliage on certain crops have made it advisable to find one or more new materials that can be used in aerosol form as a supplement to Parathion.

In Dr. W. E. Blauvelt's laboratory at Cornell University we have conducted preliminary tests against "red spider" on roses with a number of new materials and have found that at least one of these shows outstanding promise. For the present, K6451 is the code number applied to this promising new miticide by Dow Chemical Company. Our experiments demonstrate that K6451 has several properties that admirably supplement Parathion:

1. K6451 gives a much higher kill of mite eggs than does Parathion; but a much slower and often a lower kill of active stages, particularly adults.
2. K6451 exhibits excellent residual effectiveness for a period considerably longer than that provided by Parathion.
3. Preliminary tests indicate that K6451 will control mites that have developed a high degree of resistance to Parathion.
4. Present indications are that K6451 is primarily a mite control and is not as generally effective against insects as Parathion.

Data from a preliminary aerosol test with K6451 will serve to demonstrate the slow kill but high residual action of K6451. In this test K6451 was applied at the rate of 1 gram per 1,000 cubic feet - the same dosage level at which Parathion is usually applied.

<u>Observation Interval</u>	<u>No. of mites Observed</u>	<u>Percent Kill (dead &amp; moribund)</u>
1 day	674	3.56
3 days	630	36.50
4 days	799	54.81
8 days	609	90.64
13 days	673	95.05
18 days	956	97.90
25 days	719	99.58
check	580	2.07

A consideration of the properties of K6451 led to the belief that the material could best be used in combination with another compound to give a faster and higher kill of

active stages and to control insects along with the mites. TEPP was combined with K6451 but moderately severe injury to new leaves occurred on "Better Times" roses. Parathion was then used in combination with K6451 at the dosage of .5 grams Parathion and 1 gram K6451 per 1,000 cubic feet with excellent results. The "half-strength" dosage of Parathion alone was found to give a good kill of the active stages but a reduced residual action. The combination gave both a quick, high kill of active stages and a high kill of eggs, together with a long period of residual effectiveness.

Data from a typical commercial application at the dosage mentioned are as follows:

<u>Observation Interval</u>	<u>No. of mites Observed</u>	<u>Percent Kill (dead &amp; moribund)</u>
5 days	625	96.16
11 days	604	97.68
15 days	603	99.66
Pre-treatment count	720	29.16

With the cooperation of Mr. Harold Koenig and Mr. Marshall Lowman, Jr., of Elmira Floral Products Company, Elmira, New York, eighteen treatments to individual greenhouses of K6451 alone or in combination with Parathion have been made on twelve rose varieties in greenhouses ranging from 43,000 to 120,000 cubic feet. As many as three successive treatments have been applied in individual greenhouses to date.

All of our tests, both commercial and laboratory, have been conducted against "red spider" on rose because it is known that this pest on rose is more resistant than the same pest on other crops. Numerous plant species, however, have been included in the tests for the purpose of determining possible plant injury. At dosages ranging from 1 gram to 2 grams of K6451 per 1,000 cubic feet, no injury was observed to a wide range of plants representing sixteen species. When K6451 was applied alone at the rate of 2 grams per 1,000 cubic feet to a house containing "Starlite" rose, always a sensitive variety, rather severe browning of the petals occurred. The foliage was not damaged and the flower injury was confined to 1 day's cut. It should be stated, however, that at the time of the application the humidity was high in the house, considerable mildew was present, and ten days before the K6451 treatment sulfur had been applied.

The development of K6451 as a greenhouse aerosol is still in the early stages and much work must be done before the material can be made available to growers. Commercial treatments have yet to be made on such crops as cyclamen, azalea, carnations and chrysanthemums. (Since this report was presented, thirteen more commercial applications have been made and carnations and chrysanthemums have been included in the treatments. No injury was observed on these crops at the dosage level of .5 grams Parathion and 1 gram K6451 per 1,000 cubic feet). In our research, new materials will be tested as they become available with the possibility of finding more effective compounds in mind always.

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