

**CHEMICAL CONTROL OF THE BROWN MITE, *BRYOBIA ARBOREA*  
M. & A., AND OF THE CLOVER MITE, *B. PRAETIOSA* KOCH,  
IN BRITISH COLUMBIA<sup>1</sup>**

R. S. DOWNING<sup>2</sup>

Entomology Laboratory, Summerland, B.C.

The mite previously known as the clover mite, *Bryobia praetiosa* Koch, has recently been separated into two species. *Bryobia arborea* M. & A. and *B. praetiosa* Koch, and the common names, brown mite and clover mite, respectively, have been suggested (Morgan and Anderson, in press). Although the two mites are closely related, differences in their life-histories, as shown by Anderson and Morgan (in preparation), are important in determining chemical control procedures.

The brown mite is an orchard pest. Its life-history and feeding habits are similar to those of the European red mite, *Metatetranychus ulmi* (Koch), but, except for occasional outbreaks, it is not so important a pest. The clover mite, on the other hand, is not strictly an orchard pest. It feeds on a wide range of herbaceous plants, from which it often moves into dwellings; consequently it is better known as a household pest.

This report compares the chemical control of these two closely related mites.

**Chemical Control of the Brown Mite**

At the pink bud stage of apple tree development the brown mite is in the larval or early nymphal stage and is particularly vulnerable to chemical control. It has been reported that the systemic preparations demeton (Systox, Geary Chemical Company, New York, N.Y.) and schradan (Pestox 3, Pest Control Limited, Cambridge, England) (Downing, 1953), and the sulpho esters fenson (Murvesco, Murphy Chemical Company, Wheathampstead, England) and ovex

(Ovotran, Dow Chemical Company, Midland, Michigan) (Downing, in press), in pink bud applications have given excellent control of the brown mite for the whole season. Fenson and ovex, having lower mammalian toxicity than Systox and schradan, are the recommended materials in British Columbia.

The brown mite can also be controlled in the summer months (Downing, in press) but, owing to the presence of eggs as well as active mites, acaricides are less effective as summer applications than as pink bud applications.

**Chemical Control of the Clover Mite**

The life-history of the clover mite is more complex than that of the brown mite. Although the former species overwinters mainly in the egg and adult stages, larvae and nymphs are sometimes present, too. Consequently chemical control cannot be directed against active stages alone, as with the brown mite. To be highly effective against the clover mite, an acaricide must be effective against eggs as well as active stages, or have a persistent residual effect.

Most of the chemical control experiments carried out against these mites in the interior of British Columbia were conducted around homes and in gardens. The acaricides were applied with a bucket pump sprayer to outside walls of homes, or to infested grasses and ornamental plants nearby. The abundance of mites was not estimated by sampling and counting; instead, it was approximated by general observation of treated areas before and after spraying.

Sulphur dust has been recommended in some areas for the control of the clover mite around homes (Zappe, 1939); but several householders in

1. Contribution No. 3668, Entomology Division, Science Service, Department of Agriculture, Ottawa, Canada.

2. Associate Entomologist.

Summerland and Penticton claimed it was ineffective. An experiment was carried out by dusting wettable sulphur on the soil around the foundation of a home in May, 1955. Although the mites moved freely through the sulphur they survived with little or no sign of injury.

On another occasion malathion, a chemical recommended for control of the brown mite on fruit trees, was used by a householder to control the clover mite; he claimed poor results. A second experiment was undertaken, therefore, to determine the control of the clover mite by each of three acaricidal mixtures. The materials were applied as sprays to separate areas on the walls of the house, to the soil at the bases of the walls, and to plants in the garden. Malathion (25 per cent; Pennsylvania Salt Manufacturing Company, Tacoma, Washington) at two pounds per 100 gallons and wettable sulphur (92 per cent; Canadian Industries Limited, Montreal, Quebec) at two pounds were each ineffective. Kelthane (18.5 per cent 1, 1-bis (*p*-chlorophenyl) 2, 2, 2-trichloroethanol; Rohm and Haas Company, Philadelphia, Pennsylvania) at two pounds on the other hand, gave satisfactory control.

The following year, May, 1956, Kelthane (18.5 per cent) was compared in the laboratory and in the field with Sulphenone (Sulphenone 50-W, containing 40% *p*-chlorophenyl phenyl sulphone and 10% related diaryl sulphones; Stauffer Chemical Company, Mountain View, California). The latter is currently recommended in British Columbia for summer control of

the brown mite on fruit trees. In the laboratory a sheet of filter paper was dipped in an aqueous acaricidal suspension and allowed to dry. Then the sheet was placed in the bottom of a quartsize frozen-food container into which about 30 mites were introduced. The mites were confined in the container for two days, after which living and dead mites were recorded. There were five replicates per treatment. Kelthane, two pounds per 100 gallons, allowed eight per cent survival; Sulphenone, four pounds allowed 31 per cent; in the untreated control, survival was 87 per cent.

The two acaricides were applied to separate areas on the outside walls of a house heavily infested with the clover mite, and to the soil at the bases of the walls and to the lawn for a distance of eight feet from the house. Kelthane, two pounds per 100 gallons, gave excellent initial and residual control of the mites; Sulphenone, although fairly effective, was obviously inferior.

### Summary

The brown mite, a species that attacks fruit trees, was satisfactorily controlled with a pre-bloom spray of fenoxon or ovex, or either of the systemic insecticides schradan and Systox. The clover mite, which occurs as a pest on grasses and a wide range of herbaceous plants and is a pest in and around homes, was controlled with one application of Kelthane. Sulphenone controlled the clover mite fairly well, but was not so effective as Kelthane, whereas malathion and wettable sulphur were unsatisfactory.

### References

- Anderson, N. H., and C. V. G. Morgan. Life-histories and habits of the clover mite, *Bryobia praetiosa* Koch, and the brown mite, *B. arborea* M. & A., in British Columbia (Acarina: Tetranychidae). In preparation.
- Downing, R. S. Preliminary orchard trials with systemic insecticides. Proc. Ent. Soc. British Columbia 49:24-26. 1953.
- Downing, R. S. Recent trials with new acaricides in British Columbia. Can. J. Plant Sci. In press.
- Morgan, C. V. G., and N. H. Anderson. *Bryobia arborea* n. sp. and morphological characters distinguishing it from *B. praetiosa* Koch (Acarina: Tetranychidae). Canadian Ent. in press.
- Zappe, M. P. Clover mite in dwellings. In Connecticut State Entomologist, thirty-ninth report, 1939, pp. 317-318. Connecticut Agr. Expt. Sta. Bull. 434. 1940.