

## CHEMICAL CONTROL OF THE PEAR LEAF BLISTER MITE, *ERIOPHYTES PYRI* (PGST.), IN BRITISH COLUMBIA\*

R. S. DOWNING†

Entomology Laboratory, Summerland, B.C.

In British Columbia the pear leaf blister mite, *Eriophyes pyri* (Pgst.), was first recorded from Agassiz in 1894 (Venables 1937). This mite is capable of causing severe damage to the fruit and foliage of pear, and to some varieties of apple, especially Newtown and Rome Beauty. The damage appears on foliage as blisters, as implied by the name of the mite. If the infestation is severe, early defoliation, and extensive russetting and cracking of the fruit may occur.

Although it may be satisfactorily controlled with a dormant application of lime-sulphur, information was needed on the susceptibility of the mite to acaricides applied at the pink bud stage. C. V. G. Morgan, of the Summerland laboratory, has shown (unpublished data) that the European red mite, *Metatetranychus ulmi* (Koch), may be more efficiently controlled at the pink bud stage than at the dormant stage. If the "pink" spray were adequate against the blister mite, it would have the advantage of simultaneously controlling both species of mites. However, at the pink bud stage most of the blister mites are present inside newly formed blisters on the young leaves. To be effective against them, a spray would have to penetrate the blister or the healthy leaf tissue. This is a report on the effectiveness of a systemic insecticide, the organic phosphate Systox (diethyl ethyl mercaptoethyl thiophosphate) and malathion applied at the pink bud stage and of common dormant sprays.

### Methods

Four blocks of Newtown apple-trees, with a fairly uniform infestation of the blister mite, were selected for the experiment. Two blocks were sprayed with a

Turbo-mist automatic concentrate sprayer and two with a high-volume hand-gun machine. Each orchard block was divided into eight plots; five were treated in March, during the dormant stage, and two in April, at the pink bud stage, one plot being left as a control. Records of leaf infestation were made in late summer by randomized sampling of 100 leaves from each of ten branches per tree, three trees being sampled in each plot of the four blocks. The materials, their amounts, and the stages at which they were applied are given in Tables I and II.

### Results and Discussion

Results from the two hand-sprayed orchards are summarized in Table I and those for the two concentrate-sprayed orchards in Table II. The tables show that neither malathion nor Systox was effective against the blister mite at the pink bud stage, whether applied with a hand-gun or with a concentrate sprayer. In a previous experiment, 15 per cent parathion at 7.5 pounds plus lime-sulphur at 6.5 gallons per acre, applied as a pink bud spray, gave similarly poor control.

Dormant oil alone evidently gave little control of the blister mite. This is not in agreement with several authors (Quaintance 1916, Hawley 1926, Childs 1924). Childs stated that dormant oil is effective against the blister mite and that, since it kills by contact action, it must penetrate beneath the bud scales. Consequently, it is most effective when its viscosity is reduced by warm weather. Childs used an oil of 100–110 S.S.U. Vis. at 100° F., whereas in this experiment the oil was of 200–220 S.S.U. Vis. at 100° F. Perhaps the difference in oil viscosity was, at least in part, responsible for the difference in control. Childs

\* Contribution No. 3179, Entomology Division, Science Service, Department of Agriculture, Ottawa, Canada.

† Assistant Entomologist.

**Table I.—Percentages of Leaves Blistered by the Pear Leaf Blister Mite in Two Orchard Blocks in Which Various Acaricides Were Applied with a Hand-gun Sprayer at Two Stages**

Stage	Acaricide	Amount per 100 Gal.	Amount per Acre	Percentage of Leaves Blistered		
				Block 1	Block 2	Average
Dormant	Lime-sulphur <sup>1</sup>	10 gal.	50 gal.	5	3	4
Dormant	Dormant oil <sup>2</sup>	2 gal.	10 gal.	9	2	6
	DNOC (40%) <sup>3</sup>	1.5 lb.	7.5 lb.			
Dormant	Dormant oil	2 gal.	10 gal.	8	4	6
	Lime-sulphur	4 gal.	20 gal.			
Dormant	Lime-sulphur	4 gal.	20 gal.	9	6	8
Dormant	Dormant oil	2 gal.	10 gal.	25	30	28
Pink bud	Malathion (25%) <sup>4</sup>	2 lb.	14 lb.	44	32	38
Pink bud	Systox (42.4%) <sup>5</sup>	0.25 pt.	1 qt.	46	42	44
	Check, no treatment	-----	-----	35	51	43

<sup>1</sup> Specific gravity 1.28. Oliver Chemical Company, Pentiction, B.C.

<sup>2</sup> Viscosity 100° F., 200-220 S.S.U.; Shell Helix 29. Shell Oil Company, Pentiction, B.C. Emulsified with soya-flour, 0.5 pound per 100 gallons.

<sup>3</sup> DN Dry Mix No. 2. Dow Chemical Company, Midland, Mich.

<sup>4</sup> Wettable powder. American Cyanamid Company, New York, N.Y.

<sup>5</sup> Diethyl ethyl mercaptoethyl thiophosphate; emulsifiable liquid. Geary Chemical Corporation, New York, N.Y.

**Table II.—Percentages of Leaves Blistered by the Pear Leaf Blister Mite in Two Orchard Blocks in Which Various Acaricides (as in Table I) Were Applied with a Concentrate Sprayer at Two Stages.**

Stage	Acaricide	Amount per Acre	Percentage of Leaves Blistered		
			Block 3	Block 4	Average
Dormant	Lime-sulphur	20 gal.	7	16	12
Dormant	Dormant oil	6 gal.	5	17	11
	DNOC (40%)	4 lb.			
Dormant	Dormant oil	3.8 gal.	19	22	20
	Lime-sulphur	7.7 gal.			
Dormant	Lime-sulphur	9.2 gal.	12	20	16
Dormant	Dormant oil	6 gal.	21	32	26
Pink bud	Malathion (25%)	12 lb.	56	48	52
Pink bud	Systox (42.4%)	1 qt.	51	31	41
	Check, no treatment	-----	62	35	48

added that oil gives best results just after the buds have begun to burst. Presumably it is then able to penetrate more readily to the hidden mites. In the present experiment the oil was applied before the buds had started to open, and it may have been used too early for maximum effectiveness.

The other dormant spray mixtures, dormant oil-DNOC (4,6-dinitro ortho cresol), dormant oil-lime-sulphur, and the two concentrations of lime-sulphur, gave good control of the blister mite. High-

volume hand-gun application was more effective than concentrate spraying, but the two methods are not comparable in that the high-volume method involved considerably more toxicant per acre. The dormant oil-DNOC mixture controlled the blister mite as well as the high dosage of lime-sulphur. This is useful information because the mixture is cheaper, is not so unpleasant to handle, and is useful against a greater number of orchard pests than lime-sulphur.

### Summary

In high-volume spraying, the following dormant spray mixtures gave good control of the blister mite and were approximately equal in effectiveness: Dormant oil-dinitrocresol, lime-sulphur, and dormant oil-lime-sulphur. Dormant oil, 2 per cent, had little effect. A pink bud spray of the systemic insecticide Systox or of malathion had no effect on the blister mite. The control was not so good where the mixtures were applied with a concentrate

sprayer as with a hand-gun sprayer, perhaps because lower amounts of spray materials per acre were applied in the former.

### Acknowledgments

Thanks are due to Messrs. F. Seemungal, G. F. Lewis, and G. D. Halvorson, of the Summerland laboratory, for their assistance, and to Mr. C. V. G. Morgan for permission to refer to unpublished data.

### References

- Childs, L. Apple blister mite and its control in the northwest. Proc. 20th Ann. Meet. Washington State Hort. Assoc.: 102-106. 1924.  
 Hawley, I. M. The pear leaf blister mite as an apple pest. Utah Agr. Expt. Sta. Bull. 197. 1926.  
 Quaintance, A. L. The leaf blister mite of pear and apple. U.S. Dept. Agr. Farmers' Bull. 722. 1916.  
 Venables, E. P., and A. D. Heriot. The blister mite of apple and pear. Canada Dept. Agr., Pub. 577 (Circ. 125). 1937.

### EX-PLANT QUARANTINE CHIEF DIES

A man who guarded B.C. crops against transported diseases for more than a quarter of a century has died in Kelowna.

Funeral of William Henry Lyne, former Chief of Plant Quarantine with the Department of Agriculture, was held from St. Michael and All Angels' Church, Kelowna, Archdeacon D. S. Catchpole officiating.

Mr. Lyne, who was born in Oxfordshire, England, came to Canada in 1890 and fifteen years later settled in Vancouver. He immediately joined the Department of Agriculture and then became plant quarantine

chief until his retirement in 1933. A charter member of the Interstate Plant Quarantine Board, which held its first meeting at Riverside, Calif., in 1919, Mr. Lyne also was a member of British Columbia Entomological Society.

He is survived by his wife, residing in Kelowna; two daughters, Mrs. P. G. James, Kelowna, and Mrs. Donovan Allen, Vancouver; a sister, Mrs. E. Cleveland, New Westminster; a brother, J. H. Lyne, New Westminster; five grandchildren and one great-grandchild.—*Vancouver Province*.