COMPARISON OF SPRAY DEPOSITS FROM CONCENTRATE AND SEMI-CONCENTRATE ORCHARD SPRAYING[1]

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Introduction

Although concentrate spray machines are widely used in the Okanagan Valley of British Columbia, some growers use semi-concentrate spray machines. Marshall (2) has defined a concentrate sprayer as one that causes no drip from mature trees sprayed with up to 75 Imperial gallons of spray liquid per acre, and a semi-concentrate sprayer as one that applies 150 to 300 gallons per acre. The experiment reported here was undertaken to compare spray deposits on foliage when sprays were applied at rates of 50, 100 and 250 gallons per acre, with the same amount of spray chemical per acre in each case.

Methods

Two orchard sprayers in common use in the Okanagan Valley were used for the experiment. Sprayer A was a double side sprayer that delivered to each side an airstream with an average velocity, at the vent, of 87 miles per hour, and a volume of 10,300 cubic feet per minute. Sprayer B was a double side sprayer that delivered to each side an airstream with an average velocity, at the vent, of 105 miles per hour and a volume of 7,700 cubic feet per minute. The speed of travel for all spray applications was one mile per hour.

The experiment was conducted in an orchard of mature McIntosh apple trees in which the rows were 30 feet apart and the trees 30 feet apart in the rows. Trees ranged in height from 18 to 22 feet, and in diameter from 25 to 30 feet. In 1959, each sprayer was used to apply Sevin, 50 per cent wettable powder, at the rate of 4 pounds per acre in all treatments. Each treatment consisted of two replicates and there were three treatments per sprayer: 50, 100 and 250 gallons of spray liquid applied per acre. The experiment was repeated in 1960.

Sampling technique and sample treatment were as reported by McMechan et al. (1). Sevin was determined by a colorimetric method (3).

Results and Discussion

The results (Table 1) show that when the same amount of spray chemical was applied per acre the spray deposits on the leaves were not increased by increasing the volume of spray liquid. With both sprayers the 50-gallon-per-acre rate gave equal or slightly higher deposits than the 100- and 250-gallon-per-acre rates.

During the last several years sprays applied at the rate of 50 gallons of spray liquid per acre have given excellent pest control both in experimental plots and grower-sprayed orchards. In limited experiments Fisher and McMechan (unpublished results) have found that chemical thinning of apples was as good with 50 as with 100 or 250 gallons of spray liquid per acre. From the results obtained it appears that there is no advantage in using more than 50 gallons of spray liquid per acre because time is wasted in filling the sprayer when higher volumes are used.

The amount of spray chemical applied per acre should be the same for sprayers applying from 50 to 250 gallons of spray liquid per acre. When applying more than 250 gallons of spray liquid per acre the amount of spray chemical applied per acre may have to be increased because of in-

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TABLE 1—Mean Spray Deposits of Sevin (mmg./cm.²) on Apple Foliage from Two Sprayers Applying Three Volumes of Spray Liquid per Acre (Sevin, 50 per cent Wettable Powder, Applied at Rate of 4 Pounds per Acre in All Plots).

			Tree-top deposit			Tree-bottom deposit		
			Gallons of Spray liquid per acre			Gallons of Spray liquid per acre		
Sprayer	Year	Replicate	50	100	250	50	100	250
A	1959	1	1.2	0.9	0.6	3.2	2.7	1.9
		2	1.5	1.1	1.0	3.3	3.2	2.1
	1960	1	1.0	1.3	1.1	3.3	3.5	2.4
		2	1.2	0.9	1.1	3.5	2.8	2.5
	Average		1.2	1.1	1.0	3.3	3.1	2.2
B	1959	1	1.5	1.6	1.2	2.5	3.3	2.4
		2	1.6	1.0	1.4	3.0	2.7	2.7
	1960	1	1.4	0.8	1.0	2.8	2.9	2.9
		2	1.2	1.3	1.2	3.7	3.3	3.0
	Average		1.4	1.2	1.2	3.0	3.1	2.8

creased "run-off" of spray liquid from the fruit and foliage.

Summary

When the same amount of pesticide was applied per acre, spray deposits on foliage were equal for two sprayers applying concentrate sprays of 50 gallons of spray liquid per acre and semi-concentrate sprays of 250 gallons per acre.

References

1. McMechan, A. D., J. M. McArthur, and K. Williams. 1960. Effect of speed of travel on the performance of concentrate orchard sprayers. Proc. Entomol. Soc. Brit. Columbia 57: 44-47.
2. Marshall, J. 1958. Concentrate spraying in deciduous orchards. Can. Dep. Agr. Publ. 1020: pp. 34 and 42.
3. Miskus, R., and D. A. George. 1959. Colorimetric determination of 1-naphthyl-N-methyl-carbamate in agricultural crops. J. Agr. Food Chem. 7: 613-614.

Dock sawfly larvae boring holes in cedar siding.

On October 27, 1959, at the request of a pest control operator, I visited a house in Burnaby to investigate a complaint of insects boring into cedar siding. The house was six months old, in a new subdivision on a northern slope with bush only a block away. No landscaping had been done.

Thirteen sawfly larvae were collected on the outside north wall and on a cement walk next to the house. The larvae had moved from the soil, across the walk and up the cement house foundation to the painted cedar siding in order to pupate within holes on the wood. The lower edge of the siding was 18 inches above the concrete walk. By the time the owner enlisted the services of the pest control operator, they had already made many holes in the lowest 18 inches of wood.

The larvae were placed in a jar containing a large cork into which they immediately started to bore. The jar was left in an outdoor screened insectary for the winter. Adult sawflies emerged at the end of May and were identified as **Ametastegia glabrata** (Fallen) by Dr. H. E. Milliron, Entomology Research Institute, Ottawa.

A. glabrata, which feeds on docks (**Rumex** spp.) and **Polygonum** spp., normally hibernates in the stems of these plants. Occasionally it causes considerable damage in the fall by boring into apples in orchards that are not clean cultivated. It may also hibernate in the dead portions of spur growths that have been cut back the previous season.

Becker and Sweetman recorded leaf-feeding sawfly larvae **Macremphytus tarsatus** (Say) in large numbers crawling about dooryards and on buildings in Massachusetts. The larvae bored into wooden structures to make pupal cells, completely embedding themselves in decayed or naturally soft wood.

Reference

Becker, W. B. and H. L. Sweetman. 1946. Leaf-feeding sawfly larvae burrowing in structural wood. J. Econ. Ent. 39: 408.

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