TESTS WITH ORGANOPHOSPHORUS COMPOUNDS AS HOUSE FLY LARVICIDES IN POULTRY HOUSES

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Although house flies showing a high resistance to malathion have been found in some Florida poultry houses (Labrecque and Wilson, 1957), interest in the use of the organophosphorus compounds as fly larvicides has continued. Fly control is especially difficult in poultry houses maintaining caged layers, where the laying flock, as well as the younger chickens, are confined in individual screen cages about three feet above the ground. It is customary to allow the manure to collect for months at a time, and the cones that are formed under each cage soon reach a height of two or more feet. If the manure remains dry in the cones, there is little fly breeding, but when it becomes moist both the house fly (*Musca domestica* L.) and a soldier fly (*Hermetia illucens* L.) become established. In a short time the larvae break down and liquefy the entire cone, creating an increasingly serious fly problem.

Previous tests with organophosphorus larvicides as emulsion sprays or dusts have met with varying success. It has been found that, under Florida conditions, even a small quantity of water causes an almost immediate liquefaction of the manure (Wilson *et al.*, 1957). Dusters cause panic among the hens by the noise and billowing clouds of dust, which create a respiratory hazard as well; scattering the dust by hand is tedious and does not entirely eliminate the dust cloud. Tests were conducted to determine whether small quantities of deodorized kerosene sprays would provide equally effective control without the disadvantages of emulsions and dusts. The amounts of kerosene used in these tests would not have any adverse effect if the manure were later used as fertilizer.

Five organophosphorus compounds were tested as larvicides against natural populations of house flies breeding in manure under caged poultry in the Orlando area. Solutions in deodorized kerosene were made with commercial emulsifiable concentrates containing 25 per cent of Diazinon, 24.4 per cent of technical Dow ET-57 (sampled as ET-14), or 43.7 per cent of Trithion, and with technical Dipterex and malathion. Sufficient acetone was added to the Trithion and Dipterex to produce stable solutions. Duplicate tests were run at dosages of 150 gm. of insecticide in one and two gallons of kerosene per 1,000 square feet, and with 300 gm. in two gallons.

All applications were made with a three-gallon compression sprayer using a flat fan nozzle (Hudson No. 1540-5). Sufficient pressure was maintained to insure uniform coverage.

Larval density was evaluated by collecting a teaspoonful of manure from ten different locations where the infestations appeared heaviest, spreading them on a plywood board, and counting the larvae. The effectiveness of the treatments was determined from the difference in total counts made before and 2, 7, 14, and 21 days after treatment. The results are shown in table 1.

TABLE 1.—CONTROL OF HOUSE FLY LARVAE IN POULTRY MANURE WITH ORGANOPHOSPHORUS COMPOUNDS APPLIED IN SOLUTIONS IN DEODORIZED KEROSENE.

Dosage per 1,000 square feet		Pretreatment count	Percent control after—		
Grams of insecticide	Gallons of kerosene		2 days	7 days	14 days
Diazinon					
150	1	292	34	88	0
		1,000+	100	100	0
	2	841	100	100	47*
		46	81	0	—
300	2	1,000+	100	100	74*
		93	88	0	—
Dipterex					
150	1	1,000+	100	100	0
		561	100	0	—
	2	1,000+	100	41	10*
		1,000+	66	0	—
300	2	1,000+	100	78	0
		1,000+	100	0	—
Dow ET-57					
150	1	1,000+	100	91	0
		1,000+	100	44	0
	2	1,000+	100	0	—
		712	98	13	0
300	2	840	100	86	45*
		1,000+	0	—	—
Trithion					
150	1	1,000+	94	0	—
		392	61	0	—
	2	1,000+	100	66	0
		1,000+	100	0	—
300	2	1,000+	92	69	0
		1,000+	97	0	—
Malathion					
150	2	873	0	—	—
		525	0	—	—
300	2	1,000+	99	0	—
		1,000+	57	0	—
Deodorized kerosene (check)	2	1,000+	72	0	—
		1,000+	0	—	—

* No control after 21 days.

There was little over-all difference between treatments at one and two gallons per 1,000 square feet, although at the higher rate a more nearly uniform coverage was possible. Dosages of 300 gm. of insecticide per 1,000 square feet were not more consistently succcessful than 150 gm.

All the insecticides gave good control after two days in one or more tests, and all failed after a week in some tests. Diazinon was the most effective larvicide after one week, giving complete control in half the tests. Deodorized kerosene alone was not effective.

The results in some of these tests with kerosene solutions were equal to those obtained in previous tests with heavy applications of emulsions (Wilson *et al.*, 1957), and there was no liquefaction of the manure. Less successful results were obtained in some locations where resistance to phosphorus compounds was developing. Diazinon was less consistently effective than in the previous tests with dusts.

Summary

Diazinon, Dipterex, Dow ET-57 (sampled as ET-14), Trithion, and malathion were applied in small quantities of kerosene to poultry manure as fly larvicides. At 150 and 300 grams per 1,000 square feet all gave good control after two days in one or more tests, and all failed to give control after a week in some tests. Diazinon was the most effective larvicide after one week. There was no liquefaction of the manure.

Literature Cited

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