OPERATIONAL AND SCIENTIFIC NOTES

TREATING WATER AREAS WITH GRANULAR INSECTICIDES

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A rapid method has been developed for treating water areas with low dosages of granular insecticides from a boat. The principle of the method is to pump water from the lake and force it through a Venturi type filter pump. The filter pump acts as a hose nozzle, and a 35-foot spray of water can be easily obtained with a small water pump. Granules introduced into the modified side arm of the filter pump by gravity feed from a reservoir, mix with the water and are sprayed onto the surface of the lake. Since the water from the pump acts as a diluent as well as a carrier, small dosages of granules can be quite evenly distributed.

Equipment suitable for experimental applications (Fig. 1) can be easily constructed. A ring fitting a wide mouth Mason jar (B) is soldered to the inside of a 4-1/2 inch metal funnel (C) so that a Mason jar (A) can be screwed into the top of the funnel. The Mason jar is used as a reservoir for the granules. The tip of the funnel is connected to one arm of a small, 3/16 inch I.D. glass "Y" (F) by a 1-1/2 inch length of 1/4 inch I.D. plastic tubing (E). A pinch clamp (D) is placed on the plastic tubing to retain or release granules from the reservoir. The other arm of the glass "Y" is open to prevent a partial vacuum from forming in the reservoir. The stem of the glass "Y" is connected by 1/4 inch I.D. plastic tubing (G) to the modified side arm (H) of a 5-3/8 inch filter pump (I), the normal side arm having been replaced by a 2 inch brass arm with a bore 1/8 inch in diameter. A 3/4 by 1/2 inch filter pump coupling (J) is used to connect the filter pump to the output hose (K) from the water pump.

A gear-type water pump powered by a 1-cylinder gasoline motor forces water through the filter pump at a rate of 2 gallons per minute. This produces a maximum stream of water 35 feet in length, with most of the water falling between 27 and 33 feet from the filter pump barrel. Opening the pinchcock below the reservoir allows 30/60 mesh granules to flow by gravity into the side arm of the pump at a rate of 1 pound per seven minutes. The rate of application is regulated by the speed of the boat and the width of the swath to which granules are applied.

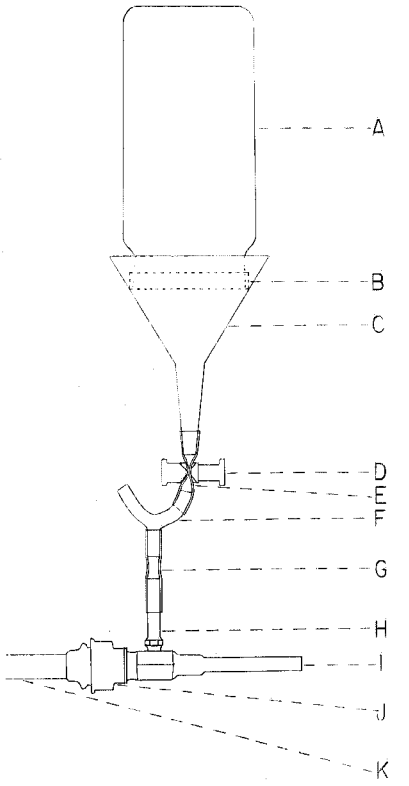

FIG. 1.—A—one quart wide mouth Mason jar. B—ring for wide mouth Mason jar. C—4-1/2 inch metal funnel. D—pinch clamp. E and G—1-1/2 inch length of 1/4 inch I.D. plastic tubing. F—small, 3/16 inch I.D. glass "Y." H—modified filter pump arm. I—5-3/8 inch filter pump. J—3/4 by 1/2 inch filter pump coupling. K—hose from water pump.

Although designed for the treatment of small experimental acreages, this method of lake treat-

ment could be adapted to commercial use as well. This would be done by increasing the size of the filter pump, the volume and pressure of water pumped through it, the size of the granule reservoir, and the rate of flow of the granules. Advantages over aircraft application would include a more even distribution of the granules, elimination of accidental insecticide contamination of adjacent land areas, and possible financial savings through the use of available personnel and less expensive equipment.

EFFECTIVENESS OF PYRETHRUM SPRAYS AGAINST MOSQUITOES AND HOUSE FLIES IN DARKNESS AND LIGHT

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During the course of aerosol studies at Beltsville, Maryland, against adult mosquitoes at practical use dosages (7 grams per 1000 cubic feet) in large darkened spaces, it was decided to employ house flies (*Musca domestica* L.) also. These tests indicated that darkness reduced the effectiveness of aerosols against house flies but not against mosquitoes. A Peet-Grady chamber was then used to study the effect of light and darkness on knockdown and mortality of laboratory-reared nonresistant free-flying adult mosquitoes and house flies (NAIDM 1948). Tests were conducted with odorless kerosene sprays containing pyrethrins at 0.033 mg./ml. against *Aedes aegypti* (L.) and at 0.8 mg./ml. against *Culex pipiens* L. Both concentrations had been used in prior mosquito studies (Fales *et al.* 1952, 1954). The dosage was 13.9 ml. per 1000 cubic feet. The Official Test Insecticide, which contains 1 mg./ml. of pyrethrins and another spray containing 2 mg./ml. were tested against house flies at the standard Peet-Grady dosage of 55.6 ml. per 1000 cubic feet. Ten-minute exposures were used in all the tests.

The tests without light were made in complete darkness. This was easy to accomplish, since the Peet-Grady chamber was located in a windowless room. In the tests with light a single 200-watt incandescent light was used. The tests under both conditions were performed at temperatures between 27° and 30° C. The sprays were not delivered until 5 minutes after the insects were released into the chamber.

The results of this study are given in Table 1. With both species of mosquitoes no difference in mortality of either males or females occurred when exposed in darkness or light, but the knockdown of *Aedes aegypti* was less in darkness. Much lower kills and knockdowns of house flies were obtained in darkness than in light.

TABLE 1.—Comparison of effectiveness of pyrethrum sprays against mosquitoes and house flies in darkness and in light

Concentration (mg./ml.)	Condition of chamber	Percent knockdown in 10 minutes	Percent kill in 1 day	
			Males	Females
		Aedes aegypti (3 Tests)		
0.033	Dark	66	32	27
ditto	Light	88	33	31
		Culex pipiens (3 Tests)		
0.8	Dark	98	88	52
ditto	Light	97	88	53
		Musca domestica (4 Tests)		
			Total	
1.0	Dark	83	2	
ditto	Light	96	17	
2.0	Dark	92	20	
ditto	Light	97	45	

Under the conditions of these tests it can be concluded that mosquitoes can be controlled by space sprays to the same degree in darkness as in light, but that this is not true of house flies.

References Cited

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