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A COMPARISON OF OIL AND FLIT MLO FOR CATCH BASIN TREATMENT[1]

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ABSTRACT. Flit MLO® performed satisfactorily in controlling *Culex pipiens* L. breeding in catch basins when applied at the rate of 1 ounce per basin. The use of Flit MLO was slightly more economical than the use of fuel oil.

INTRODUCTION. In some East Coast municipalities the design of older catch basins allows water to remain trapped, creating an ideal breeding situation for the common urban mosquito, *Culex pipiens* L.

Currently in New Jersey some control agencies employ either #2 fuel oil with or without emulsifier, Baytex, or Abate to control such mosquito populations. With an increasing concern for the environment, there has been a trend to limit their use particularly in those areas where contamination of lakes and streams may occur during run-off. While several agencies employ Flit MLO® (Exxon Company, U.S.A.) in other larval habitats the paucity of published information on its performance in catch basins warranted the following study. The purpose of this study, therefore, was to conduct a field evaluation of the effectiveness and economy of this and a related larvicide mixture which may be considered less polluting to the environment.

MATERIALS AND METHODS. Five blocks in Highland Park, New Jersey were set aside for the study. Catch basins in this area were excluded from the routine spray schedule conducted by the Middlesex County Mosquito Extermination Commission. Three larvicides, Flit MLO, #2 fuel oil without emulsifier and a mixture containing Triton X-207 (Rohm and Haas,

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Philadelphia, Pa.) were tested. The mixture consisted of Triton X-207 (1 oz.), 30W motor oil (2.5 oz.) in #2 diesel fuel (final volume 2 gallons) and is hereafter referred to as Triton mix.

Within the confines of the study area 40 catch basins containing water were chosen at random and labeled for treatment. Ten catch basins were treated with either #2 fuel oil, Flit MLO or Triton mix and 10 served as controls. Three 2.5 gallon pressure type 1940A Pro-sprayers were utilized in the application of the larvicides. One sprayer was time-calibrated to deliver 0.5 pint of #2 fuel oil/basin and two sprayers to deliver 30 ml of Flit MLO or Triton mix/basin. For the last 2, a fan-type nozzle was utilized to insure maximum coverage over the surface of the basin contents. Since sprayer delivery was not linear with time, pressure was returned to the original level before each use.

After the initial inspection, all basins were sprayed regardless of breeding activity. Subsequently, each individual basin was retreated when at least 2nd instar larvae were observed. It was felt that the presence of 1st instar larvae might not indicate a lack of control but merely the recent hatching of eggs. Possible growth retardation beyond the 2nd instar by residue from previous treatments was not considered in this study. Inspection interval averaged 6 days (range 3–9).

In the majority of inspections, the grating was removed, and enamel dippers were used for sampling. In each case, 5 dips were made, 1 at each corner and 1 in the center of the basin. The total number of larvae, their instar, and the average number of larvae per dip were recorded.

RESULTS AND DISCUSSIONS. Table 1 summarizes results indicating the residual life of each treatment (the number of days before retreatment was necessary). Due to the variation between catch basins and the effect of treatment in this study, it is difficult to select any agent which is markedly better than others for a practical catch basin program. Both Flit MLO and the Triton mixture seemed less persistent than the oil. Although the Triton mix performed at least as well as Flit MLO, more research may be necessary before it can be recommended.

While catch basins treated with Flit MLO required more frequent treatment than those treated with fuel oil, the small increase in frequency of treatment was countered by its economy. Assuming prices of fuel oil to be 13–14¢ per gallon in bulk and Flit MLO approximately 46–52¢ per gallon in bulk, a fuel oil treatment at 0.5 pint per catch basin costs 0.87¢ per catch basin. Flit MLO applied at 30 ml (1 oz.) per catch basin costs 0.41¢ per catch basin. Thirty milliliters of Flit MLO is the smallest amount recommended by states that suggest its use in catch basins. It might be better to employ the higher rate recommended (60 ml or 2 oz.) per catch basin (0.82¢ per catch basin), which is still less expensive than the fuel oil.

It should be noted that the use of an emulsifier could reduce the volume of fuel oil by ½ (4 oz.). However, in comparison, the use of Flit MLO at 2 oz. per basin would result in shorter commuting time for reloading and for treatment. Furthermore, Flit MLO has the advantage of being less noticeable and aesthetically objectionable than a larger volume of an oil treatment.

TABLE 1—Residual value of various catch basin treatments.

Treatment	No. basins	Ave. no. days between treatments±S.D.	Ave. no. treatments/ catch basin/season±S.D.
Fuel oil	9	12.3±6.0	4.6±2.1
Flit MLO	9	9.9±3.4	6.0±1.0
Triton mixture	8	10.4±5.2	5.6±1.6

Inspection interval averaged 6 days, range 3–9.

TABLE 2.—The average number of larvae per dip in catch basins receiving various treatments.

Date	Average number of larvae/dip				Rainfall inches
	Flit MLO	Fuel oil	Triton mix	Control	
6/1–6/28	.....	.....	....	.....	8.57
6/29	.....	2.25	....	1.2	....
6/30–7/6	.....	.....	....	.....	0.95
7/7	3.15	0.73	5.0	2.5	....
7/9	.....	.....	....	.....	0.31
7/11	3.81	1.08	7.65	6.36	....
7/13, 7/14	.....	.....	....	.....	2.75
7/19	13.97	6.57	3.25	4.0	....
7/21	.....	.....	....	.....	0.13
7/24	6.87	7.52	3.6	7.3	....
7/26	.....	.....	....	.....	0.28
7/28	7.67	4.66	4.7	2.86	....
8/1	.....	.....	....	.....	0.04
8/3	7.35	1.6	0.95	7.2	0.68
8/4	.....	.....	....	.....	0.04
8/11	13.57	10.96	8.05	25.5	....
8/14	0.11	3.2	1.73	30.5	....
8/18	4.64	0.4	4.08	29.0	....
8/25	7.75	5.52	7.07	30.6	0.01
8/27	.....	.....	....	.....	0.63
8/30	9.46	1.75	5.44	1.8	....
9/2, 9/3	.....	.....	....	.....	0.16
9/8	10.28	5.32	11.45	17.3	....
9/13	.....	.....	....	.....	0.01
9/14	0.6	2.0	1.55	22.1	0.03
9/19–9/30	.....	.....	....	.....	0.67

The control exhibited by the three larvicides in this experiment may not be solely dependent on the larvicide. Because of the random order of basins and their treatment, a control catch basin was sometimes within a few feet or across the street from a treated catch basin. This might have allowed for a rapid reinfestation of a treated catch basin as the larvicidal action failed.

During this study, the opportunity was taken to consider the numbers of mosquitoes breeding as they might be influenced by the treatment. Shown in Table 2 are the average numbers of larvae/dip for the various treatments along with the rainfall for the area.

Several points are evident. (1) Rainfall was heavy in June and eventually low in early August, at which time control populations rapidly increased. (2) Basins treated with Flit MLO also peaked three times, generally in association with a period of rain. This suggests two things, a) that the material in the amount applied does not survive flushing of the catch basin by rain and/or b) basins so treated eventually, with larvicidal failure, become more attractive to females seeking oviposition sites. A similar suggestion was evident in the data from Orange County, California (Kimball and Perruzzi, 1970).

As a result of this study, Flit MLO at a rate of 2 oz. per catch basin has been added to the insecticide recommendations in New Jersey. The possible influence of treatment on the level of reinfestation is being investigated.

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