

AERIAL SPRAY TESTS WITH MALATHION, PYRETHRUM, AND ALLETHRIN AGAINST *Aedes taeniorhynchus* IN FLORIDA

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Insecticide resistance in salt-marsh mosquitoes, *Aedes taeniorhynchus* (Wied.) and *A. sollicitans* (Wlkr.), in Florida was reported in 1950 by Deonier and co-workers, and King, and in 1951 and in 1952 by Keller and McDuffie. By the summer of 1955 resistance had increased to such a degree in some of the intensively treated portions of the State that satisfactory control was not obtained with DDT, BHC, or dieldrin. In that year malathion was found to be highly effective against re-

people. However, the use of pyrethrum against mosquitoes outdoors has been limited to small-scale treatments because other insecticides could be used more economically on a large scale.

Since resistance to the organic phosphorus compounds may develop, a series of tests were run in 1956 to compare pyrethrum and allethrin plus piperonyl butoxide with malathion³ in airplane applications. These tests were conducted on 100-acre plots in Indian River County,

TABLE 1.—Control of adult salt-marsh mosquitoes with aerial sprays.

Date Applied (1956)	Plot Treated	Pretreatment Count (average/ man/minute)	Percent Reduction after:		
			3 hours	6 hours	24 hours
Pyrethrins 0.1 percent plus piperonyl butoxide 0.5 percent					
August 7	B	42	6	28	..
30	A	52	85	78	0
September 5	C	98	58	61	21
Allethrin 0.2 percent plus piperonyl butoxide 0.5 percent					
August 7	A	59	71	58	..
30	C	99	84	80	7
September 5	B	86	65	48	24
Malathion 2.86 percent					
August 7	C	33	73	87	..
30	B	127	93	91	33
September 5	A	88	92	98	83

sistant adults when tested in aerial sprays (Gahan *et al.*, 1956), and this organic phosphorus insecticide is now being used in several portions of Florida.

Ginsburg (1936) reported that thorough spraying of the ground and surrounding vegetation with pyrethrum emulsion gave some protection to outdoor gatherings of

Fla., against adults of *A. taeniorhynchus*. Fuel oil solutions of these materials were applied to wooded areas where trees and undergrowth formed a canopy that increased the problem of control. Three plots were sprayed on three dates with the three materials, and each plot received

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³ The pyrethrum and allethrin concentrates were furnished by the Fairfield Chemical Division, Food Machinery and Chemical Corporation, and the malathion by the American Cyanamid Company.

each material once to minimize the effect of differences between plots.

All applications were made with a Stearman (PT-17) airplane flying 80 m.p.h. at altitudes of 75 to 100 feet. This plane was calibrated to disperse 1 gallon of spray per acre with swath intervals of 125 feet. Applications were made between dawn and 7:20 a.m. under favorable meteorological conditions. Wind velocities varied from less than 1 m.p.h. to occasional gusts up to 7 m.p.h. The flight lines were cross-wind of all test plots. A cloth flag attached to the end of a 55-foot pole was utilized to mark each swath to insure uniform coverage. The mosquito populations were sampled before and after treatment by two observers at 20 counting stations in each plot. The stations were marked for the initial test and the same stations used for succeeding ones. Control was determined by comparing the number of mosquitoes per minute that landed on the observers on the day before and 3, 6, and 24 hours after applications.

The results of these tests are shown in Table 1. The sprays containing malathion were more effective than those containing synergized pyrethrins or allethrin. After 6

hours malathion gave an average reduction of 92 percent compared with 62 percent for allethrin and 56 percent for the pyrethrins formulations. A rapid infiltration of mosquitoes reduced the control obtained after 24 hours with all the insecticides. Better control would probably have been obtained in less densely foliated residential areas.

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