

PRE-HATCHING TREATMENTS WITH DDT LARVICIDES FOR THE CONTROL OF *Aedes taeniorhynchus* (WIED.) IN THE CANAL ZONE

STANLEY J. CARPENTER¹

and

CHARLES M. KEENAN²

Madden *et al.* (1945) reported that DDT applied as an oil solution or an emulsion to ground litter and vegetation used as resting sites for *Aedes sollicitans* (Walker) and *A. taeniorhynchus* gave a reduction of adult mosquitoes for as long as two and one-half months in Florida. Wiscup *et al.* (1946) obtained satisfactory results by direct application of various forms of DDT larvicides applied at the rate of 0.2 lb. DDT per acre with hand equipment against the larvae of *A. sollicitans* and *A. taeniorhynchus* in Florida. Wiscup *et al.* (1947) found that in large scale applications of DDT sprays from airplanes as preflooding treatments in Florida, no control of saltmarsh mosquito larvae was obtained, but that direct application of DDT larvicides at the rate of 0.2 to 0.4 lb. DDT per acre gave satisfactory control of the larvae except in tall and dense vegetation.

Farfan Swamp, an area of approximately 1,200 acres, located just west of the Pacific entrance to the Panama Canal favors heavy breeding of *Aedes taeniorhynchus* at certain times during the year and presents a serious problem in nearby communities. This swamp is subject to some flooding with saltwater at high tide and frequent flooding with rainwater during the rainy season. Observations made during recent years by various mosquito control workers in the area indicate that heavy breeding of this species may be expected

following the first heavy rains after the beginning of the rainy season.

On April 22, 1949, near the end of the dry season, four 2-acre plots were given pre-hatching treatments with DDT larvicides. Plots 1 and 4 were treated with 10 percent DDT in pyrophyllite applied with a rotary type hand duster at the rate of 2 lbs. DDT per acre. Plots 2 and 3 were treated with 5 percent DDT in fuel oil applied with a knapsack sprayer at the rate of 2 lbs. DDT per acre. Plots 1 and 2 consist of dense mangrove trees which had been killed by deposits of silt from canal dredging operations. Plots 3 and 4 consist of rather open grassy areas. Our controls were selected from other parts of the swamp, well-removed from the test plots.

Light rainfall occurred in the Farfan area during the week of May 8 to 14, with a very heavy rain falling during the night of May 14 and flooding most of the swamp. An inspection was made of the area on May 18, twenty-six days after the pre-hatching treatment, and the following observations were made:

Plot 1 and Control—Water was standing in large shallow pools in which moderate to heavy densities of fourth instar larvae and pupae of *A. taeniorhynchus* were present. Approximately 100 larvae could be obtained in a single carefully selected dip with a standard white enamel dipper. Numerous adult mosquitoes were seen resting on pupal skins after emergence. Ten percent DDT dust applied at the rate of 2 lbs. DDT per acre did

¹ Stanley J. Carpenter, Colonel, MSC, United States Army, 25th Malaria Control Detachment, Fort Clayton, Canal Zone.

² Charles M. Keenan, Supervisor, Malaria Control Force, USARCARIB, Fort Amador, Canal Zone.

not give any apparent reduction of *A. taeniorhynchus*.

Plot 2 and Control—Moderate densities of larvae and pupae of *A. taeniorhynchus* were present in water-filled cracks in the earth and in small pools. Five percent DDT in fuel oil applied at the rate of 2 lbs. DDT per acre as a pre-hatching treatment gave an estimated 50 percent reduction of *A. taeniorhynchus*.

Plot 3 and Control—Breeding of *A. taeniorhynchus* was light except for one small ditch in the test plot where larvae were present in moderate numbers. No apparent reduction was obtained when 5 percent DDT in fuel oil was used at the rate of 2 lbs. DDT per acre as a pre-hatching treatment.

Plot 4 and Control—Breeding of *A. taeniorhynchus* was light in both the test and control plots. No apparent reduction was obtained when 10 percent DDT dust was used at the rate of 2 lbs. DDT per acre as a pre-hatching treatment.

Literature Cited

- MADDEN, A. H., A. W. LINDQUIST and E. F. KNIPLING. 1945. DDT Residues on Vegetation and Ground Litter for Control of Adult Salt-Marsh Mosquitoes. *Mosquito News*, 5(3):100-104.
- WISECUP, C. B., V. S. MINNICH and W. C. WHITE. 1946. DDT Applied with Hand Equipment for the Control of Salt-Marsh Mosquito Larvae. *Mosquito News*, 6(1):14-16.
- WISECUP, C. B., W. C. WHITE and V. S. MINNICH. 1947. Airplane Spraying with DDT for Control of Salt-Marsh Mosquito Larvae. *Mosquito News*, 7(3):103-108.

GROUND SPACE SPRAYING OF *MANSONIA* AND OTHER MOSQUITOES IN LEESBURG, FLORIDA *

MAURICE W. PROVOST¹

I. INTRODUCTION

Since the advent of DDT, a voluminous literature has appeared on the technique of adulticiding. Although hundreds of adulticiding techniques have appeared to be successful, there has been virtually no scientific appraisal of programs employing them. The 1948-1949 studies of the Florida State Board of Health in Leesburg were essentially an attempt to evalu-

ate a program in which the mosquitoes were primarily *Mansonia*, and the method of control was to be the use of DDT thermal aerosols and mists.

Leesburg, a city of some 9,500 population, is in the lake and rolling hill region of central Florida. It occupies an isthmus separating lakes which have large sections of their shorelines in swamp or marsh (Fig. 1). Several of these embayments penetrate the city limits. They are typically peat or muck bays supporting extensive sawgrass (*Mariscus jamaicensis*) marshes and cypress (*Taxodium distichum*) swamps. The deep organic soils of both marshes and swamps hold extensive shrubby growths of willow (*Salix nigra*), buttonbush (*Cephalanthus occidentalis*), and water willow (*Decodon*

* A contribution from the Division of Entomology, Florida State Board of Health, and the Communicable Disease Center, Public Health Service, Federal Security Agency, Atlanta, Ga. The field work was done largely by Messrs. D. B. Lieux, and W. B. Braddock, of the Public Health Service.

¹Biologist, Division of Entomology, Florida State Board of Health, Orlando, Fla.