OPERATIONAL AND SCIENTIFIC NOTES

A SIMPLE METHOD FOR DETERMINING AIRPLANE SWATH PATTERN.—Since 1946 the Kern Mosquito Abatement District has been one of the pioneers in the use of aircraft for mosquito larval control in California (Geib 1946). During the early years only the most meager information was available for aircraft use in this specific type of operation, so pioneering was a matter of necessity rather than choice. In 1947, Magy, Dahl, et al., in cooperation with the Kern District, completed tests to determine swath width, mass medium droplet diameter, foliage penetration, etc. These tests were completed utilizing magnesium oxide coated microscope slides, which they floated on wooden blocks during the aircraft spraying. While results by this method of approach revealed the great over-all value of aircraft use for mosquito control in a variety of situations, it involved many man-hours' labor both in the field and laboratory before results could be fully ascertained.

This past season, the District had occasion to determine and compare the swath width of two different types of aircraft, and it was imperative that the work be completed in as short a period as possible, because of the limited availability of the planes. The time and man power involved in the use of magnesium coated slides was out of the question at that particular period, so an abbreviated method had to be decided upon. The simple technique finally employed worked so well that we felt the information should be passed on to others who may have occasion to make a similar evaluation.

The District had on hand a supply of fluorescine dye, surplus navy sea-marker, part of which had been used in tagging adult *Aedes nigromaculis* while checking their flight in 1955. In a hasty check in the laboratory the sea-marker showed up very well on white butcher paper in a 10 percent water solution. Without further evaluation, the swath comparison check was set up for the next morning, utilizing the dye as a marker and butcher paper as the paper indicator.

The dye was pre-mixed in 5-gallon containers before pumping into the spray tank of the aircraft, as sea-marker goes into solution very slowly at this dilution. Meanwhile, the butcher paper was unrolled to a 100-foot length across the airstrip and weighted down on the edges with small piles of sand every ten feet or so, depending on the velocity of the prevailing breeze.

After the pilot made a flight across the paper spraying at the rate of one gallon per acre, an observation of swath width and pattern was recorded immediately. The center position of the flying aircraft was marked on the paper so that any type of correction that might be necessary on the boom could be immediately pin-pointed by viewing the paper. After observation, the paper was cut off at both ends beyond the swath pattern to lessen the bulk. The paper was then rolled together from both ends and marked, while another was unrolled for the next run. By this method the swath pattern of the two airplanes making three replicate runs at three different elevations for a total of 18 runs was completed in less than two hours. Work was begun in the early morning when wind velocity was at a minimum. Some difficulty was experienced with the paper by occasional gusts; however, the flying aircraft did not disturb the paper even at an altitude of only 10 feet.

Since the time these runs were made, several pilots as well as other interested persons have unrolled the sheets to prove one point or another. An issue becomes very clear and leaves little room for argument when the entire 70 to 80 foot width is laid before them for observation and study.

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THE ABILITY OF THE TOP MINNOW, *Gambusia affinis* (Baird & Girard) TO REPRODUCE AND OVERWINTER IN AN OUTDOOR POND AT WINNIPEG, MANITOBA, CANADA.—Only one record was found of the top minnow, *Gambusia affinis,* being introduced into Canada for mosquito control (Mail 1954). The minnows were released in 1924 at Banff, Alberta into warm springs, and observations made in 1953 showed that they were still present. This was the farthest north that top minnows had been successfully established. There are no records of *G. affinis* being established in a climate as severe as that which prevails in Manitoba. The normal mean temperatures during the coldest winter months of December, January and February are 6.6°, —2.1° and 2.1° F., respectively. Temperatures as low as —35° F. are not uncommon. The normal means for the warmest summer months of June, July and August are 61.9°, 67.1° and 64.4° F., respectively.

Because of the many reports of successful introductions of top minnows into some of the more northern states of the U. S. A., it was thought that these fish might be able to survive the cold winters of Manitoba. In September 1957, the late Mr. E. J. Stansfield, field manager of the