OPERATIONAL AND SCIENTIFIC NOTES

A NEW CONCEPT IN AERIAL SPRAYING. During the summer of 1958, Jefferson County (Texas) Mosquito Control District tried a new procedure for applying mosquito adulticide by airplane.

The standard procedure for the District has been to fly swaths 100 to 150 feet apart. A solution of malathion in oil, calculated to give a deposit of 0.1 lb. per acre, was used. In our particular case, the concentrate contained 0.4 lb. of malathion per gallon of oil solution. The pressure and nozzles of the Piper Super Cub were adjusted to the proper rate, 1 qt. per acre. The maximum area possible in one day has been about 4,000 acres.

In an effort to increase the efficacy of our air spray operations, we increased the amount of insecticide per gallon and widened the space between swaths. Although the evaluation of this method is incomplete, we are satisfied with the progress. Currently, swaths spaced approximately 400 feet apart are being used. The nozzle arrangement and pressure are unchanged. The concentration of malathion has been increased to 1 lb. per gallon of oil. The rate of application of the insecticide, figured on a per acre basis of the entire area, is still 0.1 lb. per acre. No attempt is made to secure an even coverage of the entire area. Perhaps a better description of the operation is: we establish a series of barrier strips through which the mosquito must move to get out of the treated area. Probably the best procedure for applying the insecticide in these widely separated swaths is to lay the first swath as a barrier strip along the down wind side of the area being treated. Subsequent swaths will be laid at 400 feet intervals back towards the first swath.

The kill within the area has been equal to the kill with the blanket, or even, coverage method. The killing time is increased. Probably the killing time is reduced in the areas actually treated, but due to the time lag created by those mosquitoes caught between swaths wandering into the lethal concentration, the over-all time is greater. The reduction of population in a given area is slower by a matter of 2–3 hours than the original method.

Use of the new method of treatment, in an area where the people affected are able to watch the airplane, has resulted in considerable criticism. The population has been educated, during the past five years, to a low-flying airplane working a 100-foot swath. Perhaps as time goes on, the public reaction will change.

There are still many problems to be solved in connection with the new method of treatment. So far, it has been used only where the area lies at a right angle to the wind direction. We do not know the effect, if any, if the 400 feet barrier swaths are laid with the wind. We have arbitrarily kept our rate per acre the same as with the old method. We do not know the necessity for maintaining this high a concentration. Perhaps the concentration could be lowered with equally good results.

We have proven to our own satisfaction during the past summer that the 400-foot swath is effective and economical. We have been able to treat in excess of 8,000 acres per day without undue strain on the pilot. In fact, 8,000 acres takes less time than a 4,000 acre day did with the narrow swath procedure.

There are some pilot difficulties to overcome in the new method as most duster-sprayer pilots are accustomed to the narrow agricultural swath. The 400-foot swath is very difficult to estimate. Our pilot, who has become accustomed to the new schedule, prefers it to the old method. If any other District has any information on this subject, we will be very glad to hear from them.—George A. Thompson, Director, Jefferson County Mosquito Control.

SURFACING TIME AS A SIMPLE CRITERION OF NORMALITY IN *Anopheles* LARVAE.—In toxicological tests on *Anopheles* larvae a moment comes when it is essential to estimate rapidly and accurately the normality of the larvae. Movement of an insect is usually taken to indicate the presence of life but does not necessarily indicate normality. In order to make the criterion of normality objective and as simple as possible, a study was made on the speed with which normal feeding and fasting third and fourth stage larvae of the LTD strain of *Anopheles quadrimaculatus* Say (Diptera, Culicidae) rise to the surface after being pipetted to the bottom of a liter of distilled water.

The larvae were reared as previously described (Jones, J. C., 1957. A new standard for the rapid detection of DDT tolerance in *Anopheles quadrimaculatus* larvae and pupae. Mosq. News 17: 1–9.) Uniform and healthy looking larvae of the third and fourth stages were washed just before pipetting them individually with a large-mouth glass pipette to the bottom of a glass liter, beaker of distilled water. The time required for a larva to reattach perfectly to the air-water interface and assume its natural horizontal stance was taken (= *surfacing time*), and the larva was then quickly submerged again until it had undergone 5 consecutive submergences. If larvae did not rise to the surface in 5 minutes, they were brought to the air-water interface and then re-submerged. A series of numbered larvae were kept without food (fasting) in 20 ml. of distilled water for 24 to 96 hours before testing their ability to rise to the surface.