

REPORT OF LARGE SCALE PRE-HATCH DUSTING FOR *Aedes vexans* CONTROL IN THE PASSAIC RIVER VALLEY DURING 1950 AND 1951

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Introduction. In the upper Passaic Valley some 20,000 acres of lowland border the channels of the Passaic, Pompton, Rockaway and Whippany Rivers. Summer floods, inundating the lowlands, result in tremendous broods of *Aedes vexans* and *Aedes trivittatus* whose flight range extends over an area populated by a million and a quarter inhabitants.

Although extensive channel improvements and lateral drainage work is in progress, temporary control operations are required to limit the emergence until such time as the more permanent controls are established. Since 1931 experimental applications of insecticides have been made by hand, ground equipment and aircraft; however, until the availability of DDT no practical results were observed.

The experiments of Hansens, Carpenter and Hart in 1946 and 1947 proved that applications of DDT dusts to the meadow surfaces when dry killed the newly hatched larvae as the treated areas became flooded. In 1948 some 300 acres were dusted with airplanes using 300-mesh agricultural DDT dust at the rate of 1 pound of DDT per acre. It was apparent that the agricultural grade of dusts was too light for aerial application, that the dust did not penetrate the vegetation to reach the ground surface and that wind conditions made the periods of application too limited for practical application.

In 1949 the Volclay Corporation was asked to develop two grades of bentonite dusts, one of approximately 30-mesh screening and the other of approximately 80-mesh screening. These dusts were impregnated with 10% DDT and applied by aircraft. Observations indicated that both coarse dusts penetrated or rolled off dry vegetation to reach the ground; however, if the vegetation was wet, as is usually the

case in the mornings, the bentonite stuck to the vegetation and disintegrated. Furthermore, the periodic rainfalls, not sufficient to cause flooding, caused the bentonite to jell and stick to the vegetation.

During the same year, the Tobacco By-Products and Chemical Corporation supplied us with test samples of waste tobacco stems ground to approximately 30-mesh screening and impregnated with 10% DDT. In preliminary tests, this material reached the ground and was not affected by occasional wetting.

1950 Tests. Two meadow areas were selected for tests in 1950, one consisting of 126 acres and the other of 75 acres. Both were of similar type with the typical meadow vegetation of calamus (*Acorus calamus*) and smartweed (*Persicaria hydropiper*). The meadow areas were surrounded by high trees.

The margins of both tracts were dusted with bentonite dust on July 2, 1950, at the rate of 1.5 lbs. of DDT per acre. The dust was restricted to a 100-foot band defined by the 170-foot contour. The center of the larger tract, elevation 166 feet, was dusted with 10% DDT tobacco stem dust at the rate of 2 lbs. of DDT per acre. The center of the smaller tract was not dusted. The purpose of the band dusting was to test a theory that flood waters must reach the 170-foot contour to remain on the meadows long enough to permit mosquitoes to emerge. Observations over many years indicated that developing larvae, several days after hatching, were concentrated in the shallow, grass-protected margins of the flood waters.

On July 10 and 11, a total of 3.84 inches of rainfall flooded the center portions of both tracts but the flood waters did not

reach the bands. Observations made within the following week indicated no mosquito larvae on the treated center portion of the larger tract; however, many larvae were found in the center portion of the untreated small tract. No floods occurred during the balance of the season and observations on the effects of the band treatment could not be made.

1951 Tests. On May 22 and 23 a total of 12,000 lbs. of tobacco stem dust, impregnated with 10% DDT, were applied to 955 acres of meadow land in the Passaic Valley. The dosage ranged from 1 lb.-1.5 lbs. of DDT per acre. At the time the area was dry and due to the weight of the dust, temperature and winds up to 15 mph had little effect on the aerial application. No effort was made to repeat the banding tests and the test plots were completely dusted.

A minor flood occurred on May 24 and no mosquito larvae were observed on the dusted meadows whereas many larvae were found on the untreated areas. Repeated wettings of the entire area took place during June and July. On July 28 a minor flood put 18 inches of water over the treated plots.

Observations made after the flooding indicated 90-95% control of mosquito larvae as compared with non-treated areas. It should be noted that observations were made in the areas where dusting had been most difficult due to nearby trees or other obstructions that made uniform applica-

tion difficult, and that two months and repeated wettings had taken place prior to the flood of July 28.

CONCLUSIONS

From tests made with DDT dusts as a pre-hatch control of *Aedes vexans* larvae over a period of 6 years it is apparent that satisfactory results may be obtained by the application of heavy or coarse dusts in the 30-80 mesh screen range provided application is made when the breeding areas are dry. Applications may be made by ground equipment or airplane, making sure to provide a uniform distribution. Procedures have become standardized, and in our situation the suggested rate of application is 1.5 lbs. of DDT per acre applied in the form of a heavy or coarse organic dust impregnated with 10% DDT solution.

Future Plans. Now that the method has become standardized it is proposed to investigate the build-up of DDT residual year by year over the treated areas.

This will permit a prescribed dosage each year to maintain a pre-season effectiveness equal to 1.5 lbs. of DDT per acre. It is also proposed to make both chemical and entomological tests of the flood waters to determine the concentration of DDT in the run-off. In short, our work in 1952 will be largely directed at the analytical side of the problem to determine what takes place when pre-hatch control is practiced over extensive areas.

SUMMER FIELD TRIP FROM OTTAWA

A mid-summer field trip is being planned for the membership on the invitation of President Twinn. Tentative arrangements involve the assembly at Ottawa, Canada on the evening of July 29 or the morning of July 30. Two days will be devoted to the inspection of Dr. Twinn's laboratories and of field problems and operations. An evening session will be held on July 30 to discuss current control problems.

Those interested should contact Robert L. Vannote, 3 Franklin Place, Morris Plains, N. J., for details. Mr. Vannote has notified the Regional Directors so that the above information should already be in the hands of the members in case this number of MOSQUITO NEWS does not reach them before the trip.