# The West Lafayette Mosquito Control Program

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The mosquito control program in West Lafayette was initiated in 1959 as a co-operative effort between the city of West Lafayette and the Entomology Department of Purdue University. Prior to this program a critical problem existed primarily as a result of the large number of areas in and around the city suitable for larval development. The purpose of this program is to reduce the biting population of mosquitoes to a negligible count.

The control operation consisted of two phases. The first of these was directed at the larvae. A basic survey was conducted at the beginning of the summer to find and map the likely areas for larval development. These surveys were valuable, as they showed the species of mosquitoes present, the breeding areas and the flight range of the various species. With this information available, it was possible to determine the advisability of treating the individual area.

An enameled dipper with a long handle was used to pick up the larvae while surveying. The surface feeding Anopheline mosquitoes could usually be captured by lowering the dipper into the water and allowing the water to flow into the dipper carrying the larvae with it. Generally the *aedes* and *culex* larvae required a quicker and deeper action with the dipper. An estimate of the larval population could be determined by counting the larvae in one dipper of the water.

In some situations one treatment with the 2 percent heptachlor granules provided control for the entire summer. This was true of most temporary pools where there was little or no run-off. In situations where there was running water part of the time, more treatments were usually required.

One control problem arose which required a different treatment that most of the others. Large number of *Aedes vexans* (Meigen) and *Psorophora ciliata* (Fabricius) were found in large numbers in a field on McCormick Road west of the Purdue University Campus. This field is owned by the Purdue University Dairy Department and is used as pasture for dairy cattle. This ruled out the use of the chlorinated hydrocarbon insecticides because of their long residual effect and the possible accumulation of residues in milk. A spray of 1 percent DDVP was used to spray the ditches, and the cattle were not allowed to re-enter the field for a period of four days as a safety precaution. Each time the ditches were flooded, more eggs were covered by the water, and another treatment was required.

Another important source of mosquitoes is Happy Hollow, a city park on the northeast side of the city. It consists of a maze of ravines through which a brook and its numerous tributaries run. After a rain there is running water in these ravines. During dry periods there are numerous small pools which usually contain large populations of *Culex restuans* (Theobald) and *Anopheles punctipennis* (Say). This area must be treated several times during the summer since the residue of the larvicide was diluted with each rain.

A field on the northern edge of the city limits was a problem area of major importance early in the summer. It is on the highway 52 by-pass at the edge of a large housing development. Much of the field was flooded after each rain and was heavily populated with the larvae of *Aedes vexans* (Meigen). Here the residual effect from one treatment was sufficient to provide control for the entire summer.

*Aedes triseriatis* (Say) was commonly encountered in the Grandview Cemetery in tree holes and in containers with decaying plants. A periodical survey was made of the cemetery, a junkyard, various trash-piles, and other places where water was likely to be standing. Other areas of occasional importance included a landfill area south of the city which had both temporary and permanent water pools; McCormick Woods where *Aedes trivittatus* (Coquillet) was found; and an area on Sycamore Lane where temporary pools formed by removal of earth for road construction contained *Psorophora confinnis* (Aitken).

It was interesting to note the shift of the larval problem from one area or type of environment to another. During dry weather Happy Hollow was an active site of larval development. When a heavy rain came, it made Happy Hollow and similar areas unsuitable for larvae, but it flooded the temporary pools and tree holes. By the time the temporary pools had dried up, the pools in Happy Hollow again contained larvae.

The second phase of this control program is directed at the adults. It was accomplished by a systematic fogging program. The city was divided into sixteen sections according to size, location, and the direction of the streets. The fogging was done with a Curtis Dyna-fog thermal aerosol generator using a 5 percent by weight solution of DDT in fuel oil. The fog machine was set to put out twenty gallons of the solution per hour.

The maximum speed of the truck during fogging is five miles per hour. The fog is effective for an estimated swath of one hundred feet. This was variable, depending on the wind.

The whole city was fogged once before any one section was retreated. This served to eliminate the initial population of adult mosquitoes. After the city was completely covered the first time, the fogging was concentrated on the areas where it was most needed. In many instances the direction and velocity of the wind was a decisive factor in selecting the section to be fogged. An area can be fogged most effectively if the direction of the wind is perpendicular to the direction of the streets in the area. Wind velocity is also a big factor in fogging. Generally an area which is unsheltered cannot be fogged effectively if the wind is very strong at all, while an area with many large trees and numerous large buildings required a stronger wind to carry the fog. Another very important factor in fogging is convection currents produced by warm air rising in the evening and carrying the fog with it. The fog was most effective when it remained near the ground for long periods of time and drifted very slowly.

Both fogging and larviciding operations were essential to the success of the control program.