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STARTING A MOSQUITO CONTROL PROGRAM

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A governmental agency feels they want to start a mosquito control program because of certain complaints received. The first thing they should do is to have a survey made. In Pennsylvania this can be done either by the State Environmental Resources Division or by another county or private concern. The survey can be done in 3 to 4 weeks.

The answer is: they need a program. Where do they start?

They should hire a man with field experience or one who has had experience in entomology or biology. This man should be an aggressive individual. They also need a second man, either part time or full time, depending on the size of the program, who has some mechanical ability. The reason for mechanical ability is that you cannot call in a mechanic or run 60 to 100 mi. to have specialized equipment repaired whenever you have a minor ailment.

You now have a start as far as personnel is concerned. The next thing you need to know is what equipment is needed. The first thing you need is transportation and you must decide how much weight you will be carrying. The most popular sizes are the 1/2 and 3/4 ton stake body trucks with 4-wheel drive. You will now think about a fogger because the complaints are: "the mosquitoes are biting." So you buy either an ultra-low-volume machine or a thermal fogger. Don't make a mistake and buy one too small because you realize you are going to grow. I must stop at this point because there may be contradictions to this starting method.

Many directors, because they are not experienced in the field, feel they must take time to make more surveys. This is not necessary; remember the mosquitoes are biting and you are supposed to be a qualified director. You can make your surveys as you progress in your work.

So we need more equipment. We will need light traps to find out what species of mosquitoes are biting. From light trap collections you can tell what type of water mosquitoes are coming from. Now that you have found the breeding area, you will need equipment for water treatment. If you have only very small ponds you can use 1 or 2 gallon shoulder tanks. The most useful are the 44 gal. back packs which you can keep pumping as you spray. I am assuming that at this point the director has already contacted the state and his chemical supplier as to the type and amount of insecticides to be used in his applications. This is very important.

You may now find your larviciding areas are too large to do on foot and you will have to go into a swamp vehicle. A dune buggy or all-terrain vehicle is not the answer. You must go into a track type machine, heavy enough to bend small trees and light enough per square inch not to exceed the weight of an average man per square inch of foot weight. On this machine you can mount spray bars, tanks and a small pump that can be controlled by the machine operator. You may also install a separate hand gun for small pond spraying. On a bombardier you can also mount a backhoe.

Other equipment needed will be 30 or 50 gal. drums for carrying your larvicide. The best recommendation for this is to carry the water and oil separately and add the insecticide as you use it, otherwise some insecticides settle out and even lose shelf life. You will need a home base to house your equipment, a fuel oil tank for storage and a small laboratory with experimental tanks and a microscope, if you can afford this. You don't need a laboratory to kill mosquitoes, but it surely helps. Don't forget your boots because you can certainly get wet feet. You will need carrying bottles of all sizes, dippers and wide-mouth pipettes.

As far as the paper work is concerned, you may need an ordinance or other legislation depending on what state you are in. Permission forms, and location and record forms will be needed. Simplified record and location forms can be made so records can be kept by the applicator. An elaborate bookkeeping system is unnecessary.

The whole process of starting a program as described can be reversed if it can be started in the spring. It then would be necessary to concentrate on the larviciding program first. The main object of this article is to establish what is needed to get a program going.

Once your program is rolling, you will notice that conditions differ from one breeding area to another. You may ask, "why do we have breeding in this pond and not in that one?" Here is where a good field man comes in—and he doesn't have to be a chief, he could be an Indian. You take samples of plant and animal life from the area and run tank tests. One may find a certain type of algae

(Stonewort), water boatmen, or some other insect killing the larvae.

Checking a pond before spraying is the greatest thing an applicator can learn to do. For instance, the boatmen do not normally eat the 1st or 2nd instar larvae; they wait for the 3rd and 4th. This is why studies have to be made in the field as well as the laboratory.

If your job is done properly, you will find you will need less insecticide. Applicators seem to forget that 1 gal of mix may cover 1 acre, not ¼ acre.

Concentrate on using minnows wherever you can. We found killies were the best because they are tough and can live in either fresh or salt water and will survive the winter.

Remember a good qualified and ambitious director can save your municipality quite a good sum of money on insecticides alone. In fact, with the price of insecticides today it is possible to save enough to hire a part-time summer helper.

Another project a director can set up is an educational program as I have done with slides, placards and a little history of mosquitoes. This can be presented to school classes, P.T.A's, church groups and service clubs.

A NON-ATTRACTIVE SAMPLING DEVICE FOR THE COLLECTION OF ADULT MOSQUITOES

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Non-attractive suction-type sampling devices have been employed for the measurement of airborne insect vector populations (Johnson 1950, Taylor 1951, Bidlingmayer 1961, 1964, 1967, Graham 1969, Service 1969, 1974). In instances where multiple collections are to be made during a single night, trap cost becomes a limiting factor.

To compare attractive and non-attractive sampling methods for the collection of adult mosquitoes and for ecological studies of *Culiseta inornata* (Williston) in the Coachella Valley area of southern California, an easily constructed, relatively inexpensive (<$60.00) suction sampler was developed. (Fig. 1).

The main portion of the sampler consists of a cylinder 36 in. long and 21 inches in diameter, fabricated from 24 gauge galvanized sheet metal. The cylinder is supported by three ½ in. angle iron legs, whose length, hence sampler intake height can be modified to suit particular needs (in this case, intake height was 54 in. above ground level). A 20 in., 5-bladed fan and motor (McGraw-Edison Model 7327, 115V. 2.6 amps) pulls air through the sampler at the rate of 2600 ft^3/min. The fan motor is mounted to a 5 in. circular plate of 24 gauge sheet metal. For support of the mounting plate, three arms of 1 in. wide 24 gauge sheet metal radiate from it at 120° intervals, joining with the cylinder wall at a position coincident with attachment of the angle iron legs. The cylindrical nature of the sampler, plus the common junction of sampler legs and fan mounting plate support arms, gives the entire assembly more than sufficient integrity.

The collecting system is composed of 3 parts: 1) an adjustable sheet metal band ca 21 inches in diameter, 2) a nylon net catch bag, and 3) a plastic concentrator vial. The nylon catch bag, similar to an insect collecting net in configuration, is sewn together from 2 sections of 32 mesh nylon marquisette netting. A rod pocket, made of muslin, is sewn onto the wide end of the completed nylon bag, allowing it to be slipped over the sheet metal band. At the apex of the collecting bag, an elastic band constricts the small opening and allows for placement of a 40-dram plastic vial whose bottom has been replaced with 50 mesh brass screen.

During operation of the sampler, the metal band (with catch bag and vial attached) is placed around the upper end of the sampler. The nylon catch bag is then released into the sampler and it and the concentrator vial are held in place by virtue of both the bag's design and the strong airflow past it. At the end of a sampling period (fan operating), a snap-on lid is placed over the vial and the collected material removed.

In current studies, this trap has been effective in the collection of various species of *Aedes, Anopheles, Culex, Culiseta* and *Psorophora* mosquitoes. Daytime operation has also shown it capable of capturing and holding several species of strong flying muscoid Diptera.

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