CDC MINIATURE LIGHT TRAP -- MODEL 512

Instructions

CAUTION! ONLY insert or remove the circuit board (LCS-2) when the battery is DISCONNECTED.

Background

Experience has shown that light traps are an efficient and productive means of collecting mosquitoes, both in consideration of the numbers of individuals captured and the diversity of species represented. The **Model 512** is an improved version of the mosquito light trap developed by the Centers for Disease Control (CDC); the trap was designed for mosquito abatement operations and arbovirus survey purposes. We have attempted to produce an efficient, convenient, and durable trap through the use of the highest quality materials available and thoughtful design. The following instructions, suggestions, and references should enable you to make full use of your light trap.

Adult surveys are most frequently conducted because adult mosquitoes are easier to locate and identify than are the larvae. The surveys indicate the various species present and their relative abundance. Additional information obtained from light traps useful to mosquito control personnel allow: (1) determining and documenting the need for a control program, (2) assessing the best times and places to use space spray equipment, (3) determining if a disease potential exists, and (4) evaluation of control measures previously applied. Light trap data are also a source of reports to supervisors and the public concerning the extent of the problem and results of control operations. A seldom appreciated advantage of light trap collections is that males are also taken; because males emerge first, in some instances, their presence in collections is a useful indicator that a new brood is forthcoming. Light traps are also useful to arbovirus survey workers, for example, a principal vector of Western Equine Encephalitis, *Culex tarsalis*, as well as other vector species, can be collected in large numbers by our traps that employ incandescent light sources.

Trap Placement

Proper location of light traps is particularly important. In general, the best catches are made where cover is good and the humidity is relatively high. Locations a short distance into the margins of wooded areas and swamps are very desirable; traps over open water or in open pasture are typically less productive. Traps should be suspended 5-6 feet above the ground, preferably 30 feet or more from buildings. To be avoided are areas near other sources of artificial light, sites exposed to strong winds, places near buildings housing animals, or those areas exposed to industrial fumes and smoke. For mosquito control operations, one or more traps should be located between known breeding sources and inhabited areas; others are best located in critical spots such as near residential and recreational sites. A single trap usually reflects mosquito flight activity within a few yards of its location. A trap may represent an area as large as a block, but this information is not always reliable, and a sufficient number of traps must be utilized to assure a representative sample. The actual number required will depend upon a number of factors including the degree of accuracy required, the manpower available, size of area involved, etc.

If a site fails to produce the expected number of mosquitoes, judging from collections in other traps in the area, the trap is relocated. Sometimes a shift of only a few yards makes a considerable difference in the number of mosquitoes attracted. If arbovirus survey work is being done where live catches are essential, care is taken to place the traps where they will be shaded from the morning sun. Most of our collection bags are provided with pockets to hold moistened cotton balls next to the mosquitoes.

Trapping schedules

Light traps are operated on a regularly scheduled basis of 1 to 7 nights per week; 4 nights' collection will usually give as valid an index as 7 nights per week. Therefore, trap collections should be made on 4 consecutive nights, such as Monday through Thursday of each week. The traps are turned on just before dark and off again just after daylight. The **Photoswitch**, **Model LCS-2**, optionally available on this trap, greatly reduces the manpower required to operate a series of traps Instead of visiting each trap to turn it on in the late afternoon and again in the morning to turn it off for the day, a photoswitch-equipped trap with the patented **Air-Actuated Gate-System** can be set up any time during the day, then later that same day at evening time, the trap starts up and runs throughout the night. At sunrise, the photoswitch shuts the trap down for the day, the gates close, keeping in the preceding night's catch. Usually 6 trips to each trap are required to collect on 3 nights; this same 3-day collection can be made with only 2 visits using the **Model 512** equipped with the **Air-Actuated Gate-System** and the **LCS-2 Photoswitch**. Older traps of anyone's manufacture can be retro-fitted at our plant or by yourself if you find that they work for your application.

Light trap collections of many species tend to fluctuate on a 4-week cycle corresponding with the phases of the moon. The best catches are usually made during the dark of the moon or on overcast nights. Rainfall during the night generally does not reduce the catch; in fact, intermittent showers appear to enhance the catch somewhat. Studies have shown that a 1-2 pound piece of dry ice in an insulated container suspended immediately above the trap substantially increases the number and diversity of species of mosquitoes caught. Additionally, the use of the dry ice-baited trap is less restricted as to placement and moonlight conditions. Also, if the trap is set late in the afternoon, diurnal species such as *Ae. aegypti* can be captured. Wide differences have been noted in the reaction of different species of mosquitoes to visible light. Some species are attracted to light traps in great numbers while others will only rarely be taken even though they are plentiful in the area. This is particularly true in the case of the common malaria mosquito, *Anopheles quadrimaculatus*, which is seldom taken in significant numbers in light traps and the yellow fever mosquito, *Ae. aegypti*. With the use of other survey techniques, e.g., landing collections, resting station collections, and dry ice-baited traps, these species can be monitored. A new trap designed specifically for the collection of *Ae. aegypti* and *Ae. albopictus* is now available from us; known as the **Omni-Directional Fay/Prince Trap, Model 112**, this trap is based on field research by CDC and U. S. Department of Agriculture scientists. A related trap, the **UV-Fay/ Prince Trap, Model 812**, was developed by Dr. K. O. Kloter of the New Orleans Mosquito Control Board to contain a 4-wt blacklight tube making it attractive to *Ae. aegypti* and *Cx. quinquefasciatus*, a vector of St. Louis Encephalitis.

Operational Details

Electrical

1. The **Model 512**, with or without the **Photoswitch**, requires ca. 320 mAmps (0.320 Amps) per hour to operate at 6.0-6.3 volts DC. Four D-size flashlight batteries (preferably alkaline) in series will provide power for 1 night's operation; however, motor cycle, lead-acid, 6 volt batteries which provide many nights' worth of power on one charge are probably the most common power source. A better source are sealed-electrolyte, lead-acid batteries as they do not leak and do not require the care in charging that nicad batteries do. You can estimate the maximum run time for a fully-charged and new battery by dividing the AmpHr rating of the battery by the consumption of the trap (ca. 0.320 Amps/Hr); older batteries, even though fully charged will provide progressively less time. A 6 volt battery capacity of 10 AmpHrs (our PN 2.30) is a good size for this trap. See the B*attery Tutorial* pdf in the *Resources* section of our web site.

2. As DC motors reverse their direction of rotation with voltage polarity changes, the battery leads are coded: the red or copper lead goes to the (+) and the black or tinned lead goes to the (-) terminals on the battery. The battery clips are removable on most versions to allow connection to the spade terminals found on many sealed-electrolyte batteries.

3. Recommended bulb types are:

Type	Voltage	Current (mAmp/hr)	Candlepower	Lifespan (hrs)
CM-47	6.3	150	0.52	3,000
CM-44	6.3	250	0.90	3,000

The trap is supplied with the CM-47 as standard.

4. Photoswitch (LCS-2). **CAUTION! ONLY insert or remove the circuit board (LCS-2) when the battery is DISCONNECTED**. Photoswitch operation (if so equipped) is simple. Put the edge of the board adjacent to the blue potentiometer UP when inserting the PC board into the card holder. After connecting the battery, cover the round photoconductive cell on the circuit board with your finger to turn the trap on as a check. The light level at which the trap will turn on and off can be adjusted via the potentiometer on the circuit board. This circuit, which is wired for 6 volt operation, can switch up to 1 amp. Reversing the polarity will not harm the circuit, trap, or battery, but the trap will not operate. You can retrofit your trap with an LCS-2 circuit yourself; see the web page describing this trap for instructions.

While this circuit seldom requires servicing, repair is available from us. Simply unplug the board and return it to us with a note describing the problem. Spare boards are available and enable field personnel to quickly change out a malfunctioning circuit.

5. Battery care and maintenance. Please see our (1) on-line battery charging tutorial and (2) methods on how to attempt to recover a battery that has been subject to deep discharge at the following url:

http://www.johnwhock.com/resources/tutorial_batteries.htm

Air-Actuated Gate System

Gate-System operation (if so equipped) is also simple. Take care not to bend the counter balance rods with careless handling or storage. Each time the trap is set up, start and stop the trap several times to make sure the gates open and close without binding. If the thin gates get jammed in the closed position, knock then free with a pencil etc., dropped down through the top of the trap. *DO NOT unjamb by applying excessive torque to the counter balance rods.*

Useful References

American Cyanamid Co. 1972. Modern Mosquito Control, 3rd ed. American Cyanamid Co., Princeton, NJ 30 pp.

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Centers for Disease Control (CDC), Public Health Service, U.S. Department of Health and Human Services. 1977. Mosquitoes of Public Health Importance and Their Control. (HEW Publication No. (CDC) 77-8140) 55 pp.

Louisiana Mosquito Control Assoc. 1983. Mosquito Control Training Manual. Louisiana Mosquito Control Assoc., 6601 Lakeshore Dr., New Orleans, LA 70126 ($10.00).

Mulhern, T. D. A Manual for Mosquito Control Personnel. Calif Mosq. Cont. Assoc., Visalia, CA 190 pp.

Service, M. W. 1977. Mosquito Ecology - Field Sampling Methods. John Wiley and Sons. New York, New York.