UVA- LED LIGHT TRAP[1]

MN: 1612

Instructions

Background

Experience has shown that light traps are an efficient and productive means of collecting mosquitoes and sandflies, both in consideration of the numbers of individuals captured and the diversity of species represented. The utility of blacklight or ultra-violet (UV) radiation in attracting a greater number and diversity of mosquito species, Culicoides, and Phlebotomines is also well known.

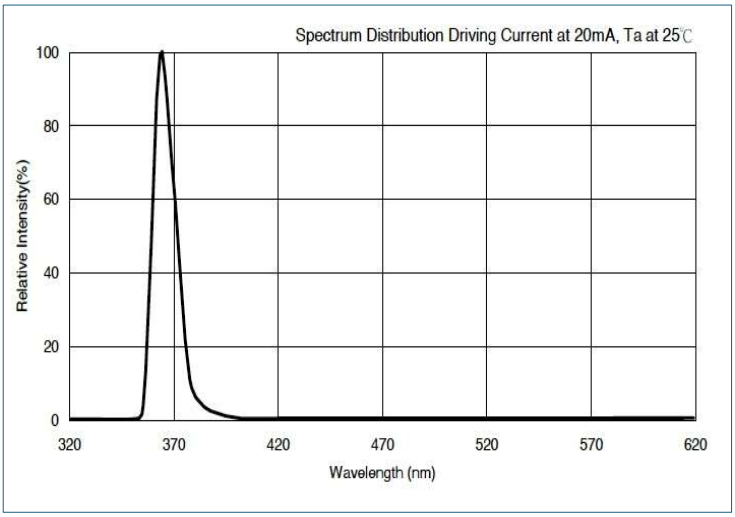

Figure 1. Spectral distribution of wavelengths emitted by the 1612 UVA-LED trap.

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We have attempted to produce an efficient, convenient, and durable trap using 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.

Characteristics of the UVA LED's This trap uses EIGHT UVA-LEDs that operate at 3.2 VDC and consume ca. 20-30 mAmps each. The wavelength emitted is between 360 and 368*nm* (UVA). Total current consumption at the trap's input voltage of 6.3 VDC is 160 mAmps for the 8 LEDs and 140 mAmps for the motor/fan; the total for the trap is 300 mAmps. Our standard 6-volt (PN 2.30), 12-Amp-Hour (Ah) sealed lead acid battery would provide 40 hours of operation; in terms of terms of 12-hour trap nights, this battery will safely provide three trap nights before requiring recharging. For our 6-volt and 20-Ah battery (our PN 2.32) the numbers are 67 hours, and five 12-hour nights, respectively.

Figure 2. The ultraviolet LEDs used in the Model 1612 CDC Miniature LED-UVA Light Trap feature quartz crystal windows and gold-plated exterior surfaces for corrosion resistance.

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.

The proper location of light traps is particularly important. In general, the best catches are made where the 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 voided 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 several 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.

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.

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 out during daylight hours, diurnal species such as *Aedes aegypti* and *Aedes albopictus* can be captured.

Operational Details

Electrical

1. The ***Model 1612*** requires ca. 160 mAmps per hour at 6 VDC. A good source of battery power are sealed-electrolyte, lead-acid batteries as they do not leak and do not require the care in charging that nicad batteries do. A battery capacity of 12 Ah is a good size for this trap.

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 white) or tinned lead goes to the (-) terminals on the battery. If input voltages are reversed, the motor will run backwards, and the LED’s simply will not light (nor be harmed with reverse polarity).

Air-Actuated Gate System

The Air-Actuated Gate System (our PN 1.30) operation (if so equipped) is also simple. Take care not to bend the counterbalance 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 attempt to un-jamb by applying excessive torque to the counterbalance rods*.

Some Useful References

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

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