

New Low For



TIMING OF INSECTICIDE SPRAYS can be improved if direct information is available on insect activity in crop plantings. In apple, pear, and walnut orchards, detection of the activity of the adult stage of the codling moth is required for optimum use of insecticides. Many insecticides used for codling moth control are most effective for direct and residual action against the moth stage, but knowledge of moth activity is important regardless of the stage of the insect against which the insecticide is effective.

Black light

Ultraviolet light traps, commonly known as "blacklight" traps, have been used for many years to attract codling moth adults. However, one of the limitations in their use has been that the ultraviolet lamps and the trap design usually employed have also attracted large numbers of other kinds of insects and clogged the traps. Sorting out the codling moths then becomes difficult and discourages use of these traps. Several types of traps and ultraviolet lamps of low intensity have been tested for the past three seasons in an attempt to find a combination that would attract substantially fewer num-

bers of other insects but still reliably index codling moth activity.

Trap details

The best of the traps tested (as described in this article) is considerably smaller than other light traps proposed for use in indexing codling moth flight. This small size, in itself, serves to limit total catches. The trap consists of a 10-inch funnel over which a single sheet metal baffle 10 inches square is attached. The neck of the funnel is removed and a jar lid is soldered on for attachment of a 1-quart jar.

The lamp is placed within the funnel, just below its edge, causing most of the light to be directed upward to sample arboreal moths more intensely than insects which do not habitually fly through the trees. This may also tend to reduce the catch of insects in which the orchardist has no interest.

The lamp holders are attached to sheet metal brackets extending upward from the lower part of the funnel. These provide enough spring tension to hold the lamp in place and are placed so that the lamp is mounted at right angles to the baffle. The lamp is a 4-watt, fluorescent,

ultraviolet unit designated as F4T5-BL.B. The tube is made of a dark purple glass which filters out most of the visible radiation. It appears white in the photo because the current was on.

A ballast, a starter and a pair of lamp holders specified for these 4-watt lamps are also required. The ballast should be mounted on the side of the funnel in line with the baffle. By locating the lamp hanger off-center on the baffle, the weight of the ballast is counterbalanced.

Installation

Since the light is directed upward, the lamp should be hung in the lower half of the tree. At least one or two traps should be placed in each orchard planting. The jar of the trap should be half filled with rubbing alcohol.

Proper installation of 110-volt service to each location is also necessary. A time switch allows convenient, automatic trap operation and should be set to turn on one-half hour before dusk and off at 11 p.m. By lighting the traps only during evening hours, when the codling moth is most active, a great deal of the catch of non-target insects is avoided.

In checking the trap, the contents are poured through a screen and into a second jar, which is then installed on the trap and replaced in the tree. The catch may be sorted at once or the insects may be placed on newspaper to dry out for easier sorting. Traps should preferably be checked each day and the number of codling moths recorded. The codling moth is the only orchard moth with a coppery tinged dark brown band at the tip of the wings. With wings folded, the moth is $\frac{3}{8}$ to $\frac{1}{2}$ inch long. Except for the tip, the wings have a brown background color, crossed with predominant, wavy bands of gray.

Intensity Ultraviolet Light Trap Detection of Codling Moth Activity

M. M. BARNES · M. J. WARGO · R. L. BALDWIN

Trial results

In the most extensive of several trials, the ultraviolet light trap described was compared with bait pails filled with fermenting molasses (renewed every 10 to 12 days). The light traps were turned on from dusk to 11 p.m., and the bait pails were available continuously. The trial ran for 38 nights with five of each kind of trap in operation. The ultraviolet light traps caught 223 codling moths, while the bait traps caught only 38 codling moths. About 80 miscellaneous insects were caught for every codling moth in each kind of trap. The total number of insects obtained in one night's catch (from dusk to 11 p.m.) was never excessive, and these were readily sorted through in the process of recording the catch of codling moths.

Steady attraction

These and other similar results show that the ultraviolet light trap is several times more effective than a trap of fermenting bait. They are also less trouble to operate once installed. Traps of fermenting bait vary in their attractancy with the progress of fermentation. They catch most moths after egg laying is well under way. Ultraviolet light traps provide a steady source of attraction and catch moths any time after emergence. These traps are particularly useful to accurately time the first treatment for the spring generation of the codling moth and also for timing, or determining the need for protection against a second generation.

M. M. Barnes is Professor, Department of Entomology, University of California, Riverside; M. J. Wargo is Laboratory Technician II, Department of Entomology, U.C., Riverside; and Richard L. Baldwin is Farm Advisor, Ventura County.

Simplified low wattage ultraviolet light trap for codling moth.

