DEVICE FOR COMBATTING FLIES

BACKGROUND OF THE INVENTION

This invention relates to a device for combatting troublesome flying insects. More particularly, this invention is directed to a device comprising a sloped target area containing a wet or dry dosage of tetrahydro-2-(nitromethylene)-2H-1,3-thiazine lethal to flies, and covered with a closely fitting or flush grill; a hollow base section having a bottom and side or sides; a cavity for the containment and concealment of intoxicated flies; and a means of supporting said target area. In the case where the device contains a wet amount of said insecticide, the device further contains a means of establishing fluid contact between the target area and a fluid reservoir in the base section.

Certain 2-(nitromethylene)-1,3-thiazines and derivatives thereof are disclosed in U.S. Pat. Nos. 3,993,648 and 4,065,560 as having useful insecticidal activity and as acting very quickly on the house fly (*Musca domestica*). While the insecticidal activity of tetrahydro-2-(nitromethylene)-2H-1,3-thiazine is specifically disclosed, the compound is not included in the class of compounds with quick action (knockdown) against the house fly. In this context, it should be noted that a compound with fast knockdown times toward a particular insect does not necessarily also possess high insecticidal activity (toxicity) toward the same insect. The insecticidal activity of tetrahydro-2-(nitromethylene)-2H-1,3-thiazine toward the house fly as well as the knockdown times of various other nitromethylene heterocycles are disclosed in *Pesticides and Venom Neurotoxicity, D. L. Shankland et al. (editors), pages* 153–69 (1978). The physical, chemical and insecticidal properties of these compounds are further disclosed in *Advances in Pesticide Science, Part* 2, H. Geissbuhler et al. (editors), pages 206–17 (Symposia Papers from Fourth International Congress of Pesticide Chemistry, July, 1978).

A fly such as the house fly is believed to activate its feeding mechanism after receiving appropriate stimuli via chemoreceptors believed to exist on its tarsi. The feeding mechanism then involves a process wherein the fly lowers its proboscis to the surface upon which it has landed, expels saliva through the proboscis and finally sucks back whatever solution results. This process is believed to be automatic when the fly lands on an appropriate surface.

Insect traps and devices are claimed in a number of issued patents. For example, U.S. Pat. No. 2,956,366 discloses a device for combatting flies consisting of moist, dark, flat discs or strips containing a water-soluble stomach poison, a foodstuff and optionally also a contact poison. U.S. Pat. No. 2,255,360 discloses an insecticide holder stationed above a hollow base with downwardly sloping sides. U.S. Pat. No. 1,056,535 discloses a fly killer which uses a capillary member or wick to draw water from a tray up to a fabric pad containing dry poison which is covered with a grid. Insect devices incorporating a means of supplying an aqueous solution of insecticide to a porous target area are additionally disclosed in U.S. Pat. Nos. 1,902,723 and 1,916,982. Other U.S. Patents which disclose insect-combatting devices include the following: U.S. Pat. Nos. 3,959,914; 3,855,727; 3,807,081; 3,653,145; 2,606,391; 2,097,924; 1,797,743; 1,672,576; 1,572,098; 1,482,992; 1,289,466; 1,200,993; 280,291 and U.S. Design Pat. No. D. 232,829. However, the listed patents do not describe the novel combination of features presently claimed nor the use of the present insecticide in the manner hereafter characterized.

SUMMARY OF THE INVENTION

A device has now been discovered which is very effective in combatting a variety of troublesome flying insects, such as flies of family Musca, including the house fly (*Musca domestica*) and the bush fly (*Musca vertustissima*), as well as flies of other families, such as the blow fly (*Calliphora vomitoria*), the fruit fly (*Drosophila melanogaster) and the stable fly (Stromoxys calcitrans*). The device is particularly effective in combatting the house fly. As one aspect of the invention, referred to as a wet trap, the device comprises:

(a) a target area of porous material comprising a sloped surface containing a dosage of tetrahydro-2-(nitromethylene)-2H-1,3-thiazine insecticide lethal to flies,

(b) a closely fitting or flush grill covering said target area but allowing contact by the flies thereon,

(c) a sloped supporting member for said target area comprising a solid sheet of rigid impermeable material shaped to conform with the shape of the target area and having its upper surface affixed to the target area so as to support and define the configuration of the target area,

(d) a hollow base section having a bottom and side or sides surrounding the bottom and perimeter of said sloped target area supporting member, the sides or sides of said base section extending up a sufficient distance to form a cavity between the side or sides of the base and the target area supporting member, said cavity being of sufficient size for the containment and concealment of intoxicated flies; the base section being attached to the sloped supporting member such that a refillable reservoir for fluid storage or containment is formed in the hollow base section, said reservoir being defined on its top by the sloped supporting member and on its bottom by the bottom of the base section, and

(e) a means of establishing fluid contact between said target area and said refillable reservoir.

As another aspect of the invention, referred to as a dry trap, the device comprises:

(a) a target area comprising a sloped surface containing a dosage of tetrahydro-2-(nitromethylene)-2H-1,3-thiazine insecticide lethal to flies,

(b) a closely fitting or flush grill covering said target area but allowing contact by the flies thereon,

(c) a hollow base section having a bottom and side or sides surrounding the bottom and perimeter of said target area, the side or sides of said base section each extending up a sufficient distance to form a cavity around and/or under said target area, said cavity being of sufficient size for the containment and concealment of intoxicated flies, and

(d) a means of supporting the target area within or above said base section which allows sufficient clearance between the side or sides of the target area and the upwardly extending side or sides of the base section for the intoxicated flies to pass into said cavity for containment and concealment.

As yet another aspect of the invention, a method is described for combatting flies utilizing either of the above devices.

The invention is based in part on the findings that tetrahydro-2-(nitromethylene)-2H-1,3-thiazine (TNMT) possesses both fast knockdown times and high