

TWO TRAPS FOR COLLECTING LIVE STABLE FLIES, *STOMOXYS CALCITRANS*, IN THE FIELD

D. F. WILLIAMS,¹ O. SKOV¹ AND R. S. PATTERSON²

Agr. Res. Serv., USDA

ABSTRACT. An animal-baited trap was developed that collected an average 369 live flies per hour in an area where the population of field flies is estimated to be 13,200. However, it was cumbersome and difficult to move from one location to another. Therefore, a smaller portable trap that was baited with dead stable flies, *Stomoxys calcitrans* (L.), was constructed. The smaller trap was easier to set up but col-

lected fewer live flies and was subject to breakage if placed in pastures with cattle. In an area with an estimated fly population of 66,000, the collection rate of the smaller trap was 50 flies per hour. Both traps proved useful in collecting native stable flies for biological assays during sterile male releases on St. Croix, U.S. Virgin Islands.

Various trapping devices have been developed to collect biting Diptera in the vicinity of livestock (Bruce 1938, Wilson et al. 1966, and Williams 1973). Most of these devices were designed to monitor or control insect populations so they kill the flies. Since we wished to capture large numbers of native stable flies, *Stomoxys calcitrans* (L.), to start a laboratory colony at the Federal Experiment Station, U.S. Virgin Islands, and also to monitor sterility in the native population by capturing native flies after sterile male releases were begun, we needed traps (1) with the ability to collect large numbers of live flies in a short time, and (2) with portability so we could transport them easily and quickly from one collection site to another.

MATERIALS AND METHODS. The first trap designed had a young heifer as an attractant and was similar in design to those of Magoon (1935) and Roberts (1965). This animal-baited trap, large enough to hold a 500-kg cow or pony (Fig. 1), was constructed of wood and 46 x 41 mm mesh plastic screen. Its overall dimensions were 239 cm long x 104 cm wide x 168 to 183 cm high. The slanted roof was

made of a 4 x 8-ft (1.2 x 2.4 m) sheet of 1/4-inch (0.635 cm) exterior plywood. A wooden door (66 x 157 cm) was placed at each end to allow entry and exit of the animal. Inner stanchions of 2 x 4's (5.08 x 10.16 cm) were used to restrain the animal so as to prevent damage to the walls and doors. The base of the trap consisted of treated 4 x 4's (10.16 x 10.16 cm). The sides were made of 1/4-inch (0.635 cm) exterior plywood (lower half) and screen (upper half). Four louvered slots were prepared in the wooden half of the trap. One pair of slots was situated 41 cm from the base, and the other pair was 76 cm from the base. The upper slots were 97 cm long and the lower ones were 81 cm long. The opening of the slots was slanted inward and measured from 18 cm to 6 cm. This louvered arrangement prevented escape of captured flies.

The trap was transported by pick-up truck to the collecting site, usually a dairy. Generally, 3 persons were needed to load and unload the trap if the truck could be driven directly to the trapping site.

Because tick-borne diseases of cattle and horses are prevalent on St. Croix, the bait animal could not be moved with the trap from one location to another. Therefore at each location, a young animal, usually a dairy animal, was trained for use in the trap. When the trap was baited, both doors were opened, and the animal was led into the trap. A bucket of feed was sometimes

¹Federal Experiment Station, Kingshill, St. Croix, U.S. Virgin Islands 00850.

²Insects Affecting Man Research Laboratory, Agr. Res. Serv., USDA, Gainesville, Florida 32604.

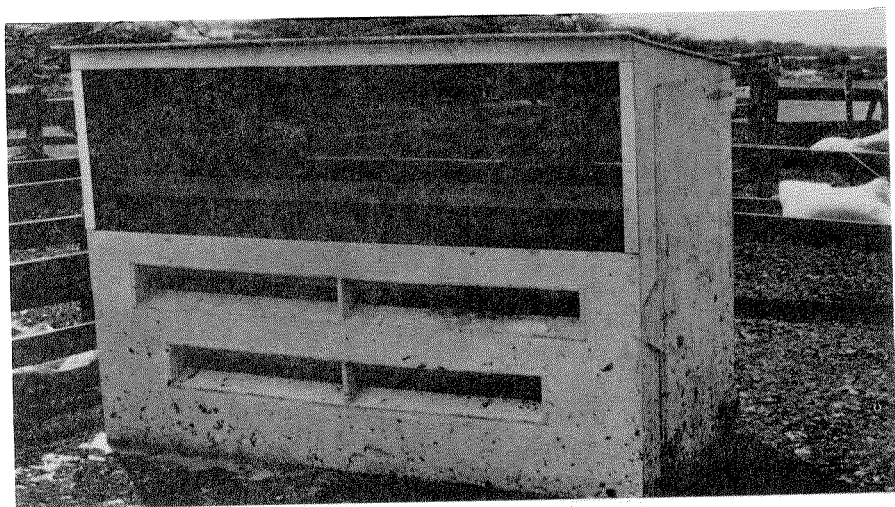


Fig. 1. Animal-baited trap used to collect stable flies.

used as an inducement. Once the animal was inside, the feed bucket was placed on the ground, and the inner stanchions were put into place (fitted into grooves). Both doors were then closed, and the animal was left in the trap for 5 hr, from 8:00 a.m. to 1:00 p.m. (This interval was selected more for convenience of the workers than for greatest fly activity.) After the flies entered the trap and took a blood meal they rested on the upper inside screen surfaces. When the collection interval was over, the front door was opened, the stanchions were removed, and the animal was led out quickly with a minimum loss of flies. Then a worker entered the trap, closed the door, and collected the resting flies with a 115-V-AC vacuum cleaner that was modified by attaching a plastic collection tube to the suction hose. In areas where electrical power was not available, the vacuum cleaner was battery-powered. Captured flies were transferred to small cages (25 cm long x 14 cm wide x 20 cm high) and returned to the laboratory.

Since there were no animals present at some collecting sites, a smaller trap was designed which used older dead flies as

the attractant. The flybaited trap (Fig. 2) consisted of a box (no roof) constructed of 1/2-inch (1.27 cm) plywood. It was 71 x 48 x 25 cm deep with slots 5 cm up from the base cut in both ends and both sides. The slots at each end were 36 cm long and 4 cm wide, the slots along the sides were 8 x 4 cm. The roof, 71 x 48 x 33 cm high and made of wood and screen, was separate and was placed over the box to prevent flies from escaping. The trap was equipped with handles for carrying.

A laboratory cage of adult stable flies that had completed laying eggs was used as the bait. These old flies were killed by a short exposure to steam (to insure that none of the flies captured in the trap were escapees from the old colony cage). Once the trap had been transported to a collecting site, an easy matter, the top was removed, and the bait cage was placed inside. The top of the trap was then replaced. Five hours later the flies were collected after the slots were first covered with 2-inch (5.08 cm)-wide masking tape to prevent escapes. The entire unit was then returned to the laboratory for evaluation. There the cage was placed in a cold

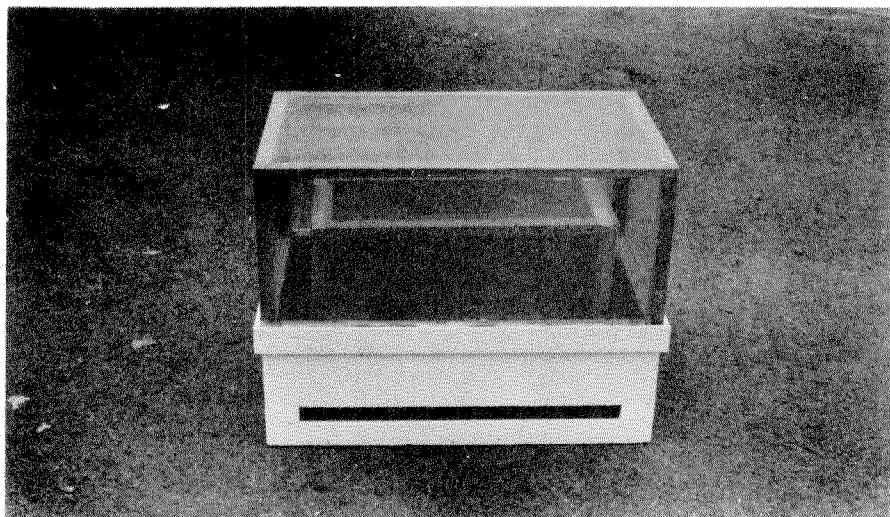


Fig. 2. Fly-baited trap.

room (1-2°C) to anesthetize the captured flies before identifying and counting.

RESULTS AND DISCUSSION. The animal-baited trap has been used for 18 months with highly satisfactory results. For 27 days in September and October 1974, a total of 49,846 stable flies was collected. Since the trap was in operation for only 5 hr per day, the total trapping time was only 135 hr. Thus, the average collection rate was 369 stable flies per hour. Such large numbers were not collected when populations were low, but the trap was highly effective in collecting stable flies when it was placed in close proximity to the herds.

The fly-baited traps have been in use for only 6 months, but they too have been satisfactory. Handling and operating them is easy (only one person is needed) and setup and collection time is shorter than with the large animal-baited traps. Also, the fly-baited traps can be set up at most locations and are not dependent on the availability of animals. As many as 250 stable flies have been collected in a 5-hr

period when a total fly population was estimated to be 66,000 in the area of the fly-baited trap, whereas the animal-baited trap under similar conditions collected 1,600 stable flies. Thus, a disadvantage of the fly-baited trap is that it does not collect as many stable flies as the animal-baited trap which is an important factor in low density areas.

Literature Cited

- Bruce, W. G. 1938. A practical trap for the control of horn flies on cattle. *J. Kans. Entomol. Soc.* 11: 88-93.
- Magoon, E. H. 1935. A portable stable trap for capturing mosquitoes. *Bull. Entomol. Res.* 26: 363-369.
- Roberts, R. H. 1965. A steer-baited trap for sampling insects affecting cattle. *Mosquito News* 25: 281-285.
- Williams, D. F. 1973. Sticky traps for sampling populations of *Stomoxys calcitrans*. *J. Econ. Entomol.* 66: 1279-1280.
- Wilson, B. H., N. P. Tugwell, and E. C. Burns. 1966. Attraction of tabanids to traps baited with dry ice under field conditions in Louisiana. *J. Med. Entomol.* 3: 148-149.