the larvae with larvae associated with adult female *T. circularis*. In all cases the eggs proved to be those of *T. circularis*. No other mite eggs were found in the sediment. Eggs deposited in the laboratory also were buried in the substrate, and they hatched in about 10 days at 23°C.

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A RELEASE CAGE FOR THE MASS DISTRIBUTION OF FLIES AND OTHER INSECTS

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The stable fly, *Stomoxys calcitrans* L., is an aggressive biting insect that must be handled carefully by personnel charged with releasing large numbers for dispersal studies or sterile male releases. The flies seek the nearest blood source, including man, and once free inside release vehicles can be so distracting and annoying they can possibly cause vehicular accidents. In the conduct of the sterile-male release program on St. Croix, U.S. Virgin Islands, we attempted to develop holding and release containers that would assure some degree of protection to personnel. These releases were conducted either at fixed locations where large numbers of flies were required (ca. 12,000) or at mobile locations which required a smaller number of flies (ca. 4,000+).

In the releases involving the larger number of insects the flies were freed from a fixed station which consisted of a wood frame, plastic-screened cage (29 x 55 x 43 cm) with a solid plywood door. The door was hinged on the bottom and a coiled spring installed on one side of the cage to insure its opening when tripped. After a cage was loaded with anesthetized flies, the door was secured by a simple bolt pin latch attached to a length of nylon line. Thereafter the cage was placed on the stationary platform ca. 2 m above the ground (to protect the cage from cattle) and secured, the door could be opened by pulling the nylon line. This cage is similar to other types already described in the literature, whereas the cage used at the mobile location, which is described

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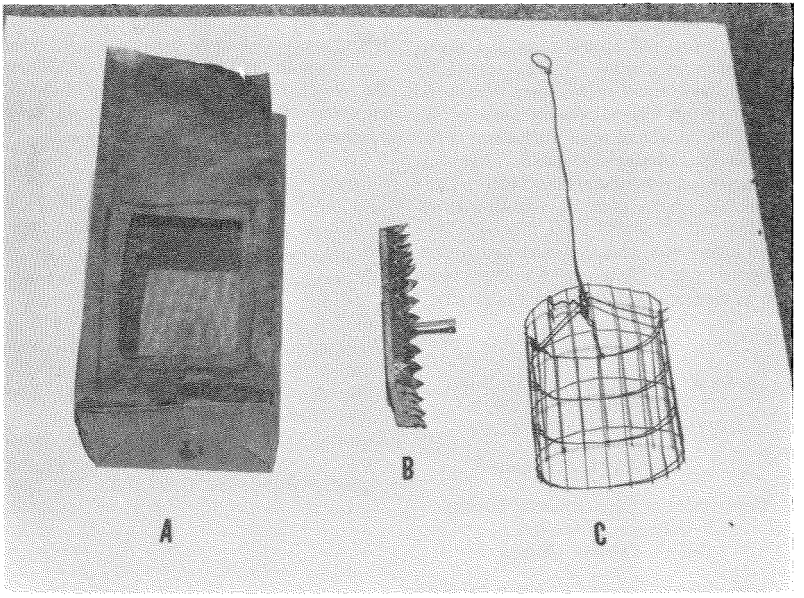

Fig. 1. Mobile release bag: A. Paper bag with screened windows. B. Aluminum shredder used to cut bottom of bag open. C. Wire frame used to keep bag extended.

herein, is a new concept in insect release techniques.

Containers for the release of smaller numbers of flies consisted of 3 parts: (1) a paper bag, (2) a shredder, and (3) a circular wire frame (Fig. 1A, B, & C). The paper bag (13.97 x 20.32 x 45.72 cm) was fitted with 15-cm plastic screen windows on 2 sides so fluorescent dust could be made to penetrate and mark the insects and so the flies would survive better during transportation to the field. Before the windows were used 43% of the flies were dead or moribund at the time of release; after the window was added, less than 5% of the flies were moribund, and less than 2.3% of 2 million flies were dead at the time of release.

The shredder consisted of a wooden block (11 x 16 x 1.9 cm) fitted with a serrated strap aluminum along its narrow edge. A rod 8 cm long x 1 cm in diameter protruded through the center of this block and faced in the same direction as the serrations. About 1 cm from the end of the rod, a 0.2-cm diameter hole was made in the rod where a metal pin could be inserted. The block was placed in the bottom of the open bag, and the rod was pushed through the base of the bag.

The circular wire frame consisted of hardware cloth 20 cm long x 15 cm in diameter and was fitted with a 25 cm length of wire attached to the center of the cross supports. The anterior end of the wire was looped to accommodate a snap hook. The purpose of the wire frame was to give rigidity to the bag during loading, marking and transport as well as to aid in shredding of the bag during release.

Before the insects were immobilized and irradiated, the shredder was fitted into the paper bag. After the immobilized insects were irradiated in an insulated radiation container (Smittle, personal communication), they were poured into the bag. Then the wire frame was inserted into the bag, and the top of the bag was closed around the protruding wire and sealed with masking tape to keep the snap hook loop exposed. When the insects had fully recovered, the bag was placed in a dusting chamber and the fluorescent dust was blown in.

Once the bags of flies had been taken to the desired release location, the shredder rod protruding from the bottom of the bag was attached to an angle iron frame mounted on the side of the transporting vehicle. This was done by inserting a pin through the small hole at the end of the shredder rod so the base of the paper bag was fastened to the iron frame. A strong piece of nylon cord with a snap hook on

one end was attached to the protruding loop of the wire frame and passed through a nearly closed side vent window. The operator of the moving vehicle could pull the cord while driving. The result was that the serration on the block moved and tore open the bottom of the bag thereby releasing the insects. There was little opportunity for the released flies to enter the vehicle. We are presently releasing an average of 140,000 sterile stable flies daily over an 84 square mile area in 3 man-hours. This container could easily be used for other insects such as mosquitoes with satisfactory results.

A NEW NORTHERN LIMIT FOR THE DISTRIBUTION OF *ORTHOPODOMYIA SIGNIFERA*

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Orthopodomyia signifera (Coquillett) has been reported from Cuba, Mexico, Puerto Rico, Virgin Islands, and in 36 states and the District of Columbia in the United States (Zavortink 1968). It has also been recorded from Point Pelee National Park, Ontario (41 56'N, 82 31'W) (Smith and Trimble 1973). The finding at Point Pelee was the first record of the species in Canada.

From May to October, 1975–76, tree holes containing water suitable for mosquito larvae were checked in southwestern Ontario. Two larvae of *Or. signifera* were collected September 26, 1975 at Guelph, Ontario (43 34'N, 80 16'W). The larvae were reared to adults and identified according to Carpenter and La Casse (1955). The specimens were verified by the Biosystematics Research Institute, Ottawa. The record at Guelph represents the northern limit for the distribution of *Or. signifera*. The larvae were collected from a cavity 18 cm. in diameter and 10 cm. deep located 0.7 m. above ground, in the side of the trunk of a silver maple (*Acer saccharium L.*). During 1975–76, the tree hole always contained water. The water had suspended particles of organic matter and periodically the surface was covered with a scum. The water in the tree hole froze completely to the bottom of the cavity during the winter. Other mosquito larvae, found in association with the *Or. signifera*, were *Aedes triseriatus* (Say) and *Culex restuans* Theob.

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THE OCCURRENCE OF *AEDES PROVOCANS* IN PENNSYLVANIA

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On April 21, 1975, a single fourth instar larva of *Aedes (Ochlerotatus) provocans* (Walker) was collected from a shallow woodland pool near Ridge Road, Point Township, Northumberland County. For the past 74 years, *Ae. provocans* has been known as *Ae. (Och.) trichurus* (Dyar). In 1977, Wood synonymized *trichurus* with *Ae. (Och.) provocans* (Walker); the latter name has priority over *trichurus*. The temporary pooling where the larva was found is caused by wet weather spring water being trapped in depressions along a mountain bench that parallels the Susquehanna River's North Branch. The specimen was preserved and mounted, and presented for verification to the Medical Entomology Laboratory of the Department of Environmental Resources in Harrisburg.

Other mosquito species occupying the same pools were *Ae. (Och.) abserratus* (Felt and