A CAGE AND SUPPORT FRAMEWORK FOR BEHAVIORAL TESTS OF FRUIT FLIES IN THE FIELD—A field cage has been used and standardized for evaluating the mating propensity and competitiveness of mass-reared fruit flies under outdoor conditions (D. L. Chambers, C. O. Calkins, E. F. Boller, Y. Itô, & R. T. Cunningham. 1983, Z. Ang. Ent. 95: 285-303). The cage, constructed from Saran® screen of 20 x 20 mesh is cylindrical with a flat floor and ceiling. It measures 2.9-m diam and 2.0-m high. Sixteen metal grommets, for guy wire attachment, are fitted exteriorly at each seam where the wall joins the top and bottom. This provides external support of the cage. Access to the cage is through a vertical zipper in the wall. In addition, the floor is fitted with a 2-way zipper that allows a host plant to be caged.

Initial quality control and behavioral tests using this cage were conducted in a Guatemalan coffee finca where the cage was supported by ropes tied to surrounding shade trees and the bottom was secured by metal stakes driven into the ground and tied to the grommets. Subsequent tests were not always conducted where suitable supporting structures (trees or other elevated objects) were present. This resulted in uneven tensions placed on the upper section of the cage causing it to bulge and sag. When cages were erected on sandy or rocky substrates, the metal stakes were not adequate to support the cage in place. Thus it became necessary to design a free-standing framework to hold the cage and to provide tie-downs that would allow the cage to be stretched uniformly in all directions, consequently eliminating folds, sags and wrinkles behind which test insects could rest.

The framework is constructed with 2.5 cm (one-inch) pipe and connections of polyvinylchloride (PVC), Schedule 40. The frame consists of 2 octagonal rings (diam 316 cm) supported by vertical pipe 220-cm long (Fig. 1). Each ring consists of 8, 45-degree connectors and 8 T-connectors interspersed by pipe 61-cm long (Fig. 2). The T-connectors accept the vertical 220-cm support pipes.

To erect the cage, it is first laid on the ground in a collapsed fashion with the ceiling on top and within the upper ring. Then heavy cord is threaded through each grommet and tied to the midpoint of each 61-cm section of the ring. When the ceiling has been stretched tight and secured, the ring is lifted and the upright supports are inserted into the T-connectors. The bottom ring is then put into position and the lower end of the uprights are inserted into the opposing T-connectors. Then the bottom of the cage is stretched and secured similarly to the ceiling. Erection of the cage and frame is easily accomplished with 2 people in about 30 min.

When erected, the cage has no folds, sags or bulges and can be easily picked up and moved by 2 people to desired areas. Because the PVC pieces fit tightly without gluing, they can be disassembled easily for transport and storage. The cost of the materials for the frame is about $82 (Gainesville, 1983). With reasonably careful handling the materials should last indefinitely. (Mention of a commercial or proprietary product does not constitute an endorsement by the USDA.) We thank F. L. Lee and S. Masuda for ideas and assistance in completing the cage support.—C. O. CALKINS AND J. C. WEBB, Insect Attractants, Behavior, and Basic Biology Research Laboratory, Agric. Res. Serv., USDA, Gainesville, FL 32604 USA.
Fig. 1. Supporting frame for field cage.
Fig. 2. Ring sections of supporting frame showing how polyvinylchloride pipe and connections are assembled.