MASS PROPAGATION OF *CATOLACCUS GRANDIS* IN SUPPORT OF LARGE SCALE AREA SUPPRESSION OF THE BOLL WEEVIL IN SOUTH TEXAS COTTON

J. A. Morales-Ramos, Extension Associate
Texas A&M Extension Service
M. G. Rojas, and E. G. King, Research Entomologists
USDA-ARS Subtropical Agricultural Research Laboratory
Weslaco, TX

Abstract

A new cage system for mass propagation of *C. Grandis* was developed. The new systm eliminates the need for adult transfer between different cages and release containers.

Introduction

During the last 6 years the boll weevil parasitoid, *Catolaccus grandis* (Burks) has been mass produced by two mass rearing methods. The first method consists of the use of two different cage systems: one to obtain the adult emergence and the other to condition the adult females prior to release (Morales-Ramos et al. 1992). This method has been proven effective in producing high quality parasitoids, but it requires the transfer of adult wasps between the two cage systems and to the release containers. The transfer is accomplished by aspiration aided by vacuum pumps, requiring intensive labor and space.

The second method consists of extracting the *C. grandis* pupae from the Parafilm$^{\Gamma}$ capsules and placing them inside gallon-size containers designed for conditioning and release of adult wasps (Morales-Ramos et al. 1994). This method eliminates the labor required to transfer the adult wasps by aspiration between cages and release containers. However, this method introduced additional problems such as the need for separation of parasitoid pupae and the difficulty in presenting the required host contact to the adult wasps. Another problem is that the volume of the release container was necessarily increased by a factor of 4.

The objective of the present work was to design a new rearing system that eliminates the need for adult wasp transfer, provides accessibility for adult conditioning, and eliminates the need for the separation of parasitoid pupae, while minimizing the volume of the release container.

Materials and Methods

A new system of cages was developed to mass rear *C. grandis*. The new system consists of three cages: emergence cage (Figs. 1 & 2); conditioning cage (Figs. 3 & 4); and release cage (Fig. 5). The emergence cage was made of galvanized metal and has a rectangular shape 13" long, 10" wide, and 9" high (Figs. 1 & 2). These dimensions were designed to hold 3 trays of artificial diet-reared parasitoids. On the top of the cage, a metallic funnel helps guide the emerging *C. grandis* females to an exit connecting to the conditioning cage.

The conditioning cage was made of transparent acrylic plastic. Its shape was cubic with a truncated pyramidal ending connecting it to the release cage. The base of the cage was 8 X 8", the cubic section was 8" high. The pyramidal top ended in a 5 X 5" square (Figs. 3 & 4). The adult *C. grandis* emerged into the conditioning cage through 5 holes (5/16" diameter each). The holes were connected through plastic tubi (0.5" long) to prevent the adult wasps from returning to the emergence cage. In the conditioning cage, the *C. grandis* females were exposed to host larvae for 2 d after they have passed their preovipositional period. Encapsulated host larvae were introduced into the cage through a circular opening with a 6" diameter sleeve.

The release cage has a cylindrical shape (4" diameter and 6" high) (Fig. 5). It is made of transparent acetate of cellulose and covered on one end with a polyester screen. The base is connected to the top of the conditioning cage by 13 plastic tubes (0.25" diameter). The adults females are phototactically stimulated to move into the release cage when the conditioning cage is darkened by enclosing it with 2 layers of black felt. Parasitoids oriented to the light and geotacticlly to the uppermost portion of the cage.

To test the functionality of the system, 5 cohorts of approximately 300 females and 30 males of *C. grandis* were allowed to emerge into the conditioning cage. Then, they were conditioned at 2 d of age with 60 encapsulated boll weevil larvae per day for a period of 2 days. At the end of the 4-d period, the cage was covered to stimulate the adult parasitoids to move to the release cage. The percentage of parasitoids failing to migrate into the release cage was measured for each trial.

Results

Six to 8 % of the females failed to move into the release cage in the 5 different trails. This percentage is acceptable for mass propagation. These losses can be adjusted by increasing the number of females introduced into each cage.

References

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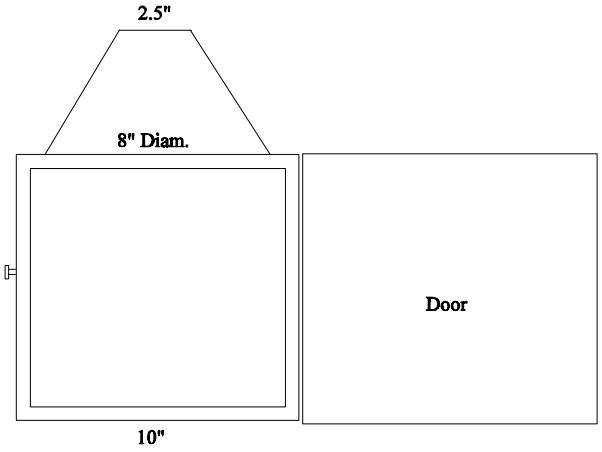

Figure 1. Emergence cage, front view

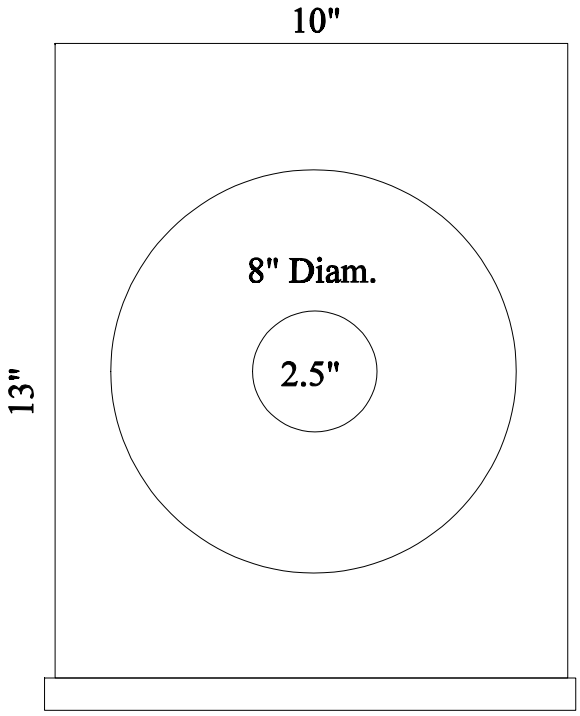

Figure 2. Emergence cage, top view

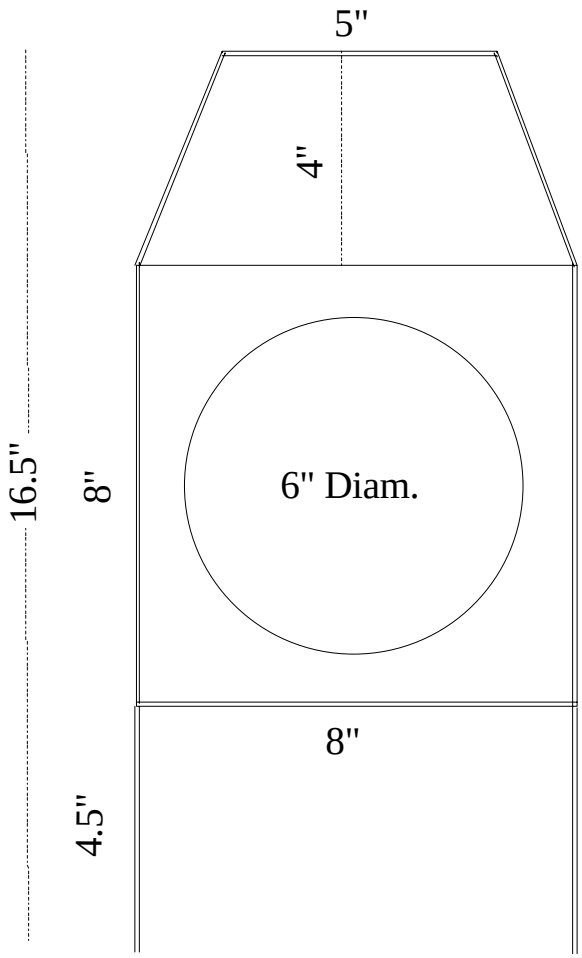

Figure 3. Conditionning cage, front view.

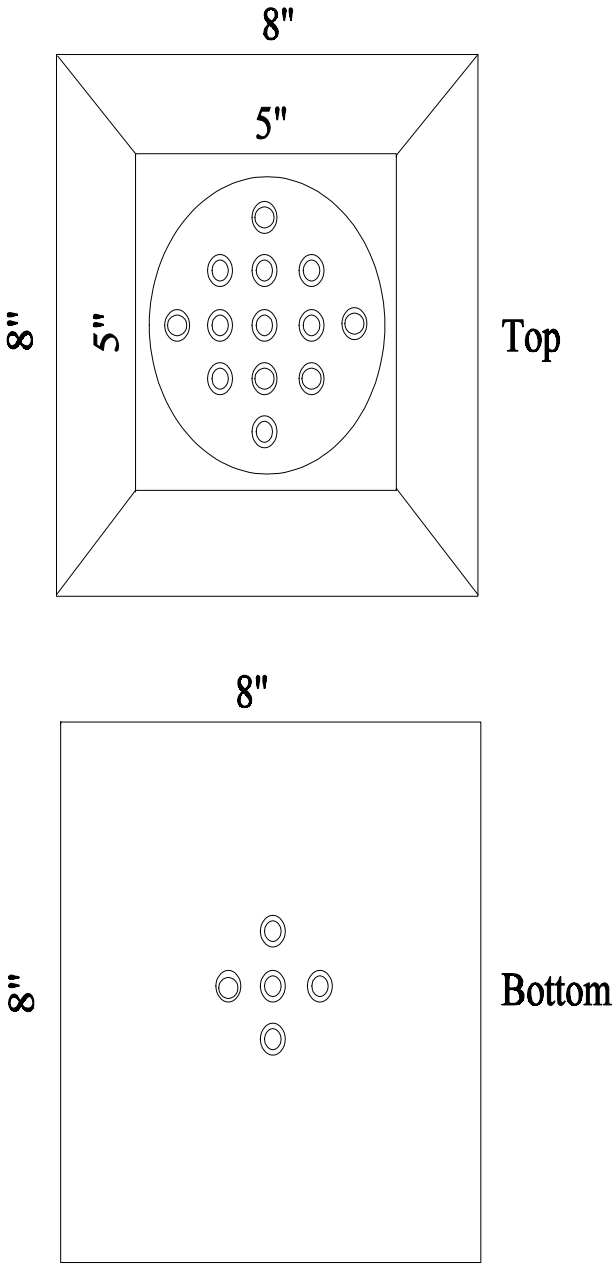

Figure 4. Conditioning cage, top and bottom views.

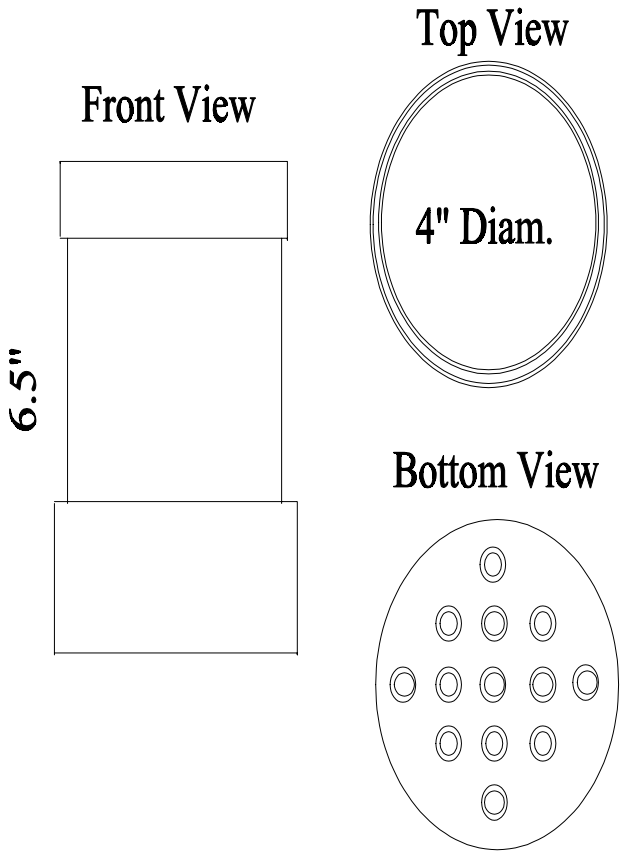

Figure 5. Release cage, front, top and bottom views