



# Bird Netting Escape Test

Prepared by  
Aubrey Moore and Roland Quitugua  
University of Guam Cooperative Extension Service

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## Abstract

Single and multiple layers of half-inch bird netting are not effective barriers for adult rhino beetles leaving breeding sites.

This experiment was performed to test the idea of using half-inch bird netting to prevent adult rhino beetles from leaving breeding sites in compost piles etc. This tactic was invented to mitigate emergence of adults from a large pile of chipped coconut material at Mamala Bay Golf Course at Hickam Air Force Base on Oahu, Hawaii. The original idea was that the majority of beetles leaving the pile would be entangled in the bird netting or be reflected back into the pile. It was also hoped that the bird netting could be used to prevent infestation of potential breeding sites.

## 1 Methods

Sixteen freshly trapped rhino beetles were put in each of four plastic containers ([Sterlite 1963](#); 14 x 11 x 3.25 inches) filled with moist peat moss. Three of the containers were placed in pouches made from one, two, and three layers of half-inch bird netting ([Easy Gardener BirdBlock](#)) (Fig. 1). The containers were placed in a line perpendicular to the wind in a large field cage (20 x 20 x 10 feet) (Fig. 2). A minibucket trap equipped with an oryctalure and a UVLED was placed 10 feet upwind

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C:/Documents and Settings/Administrator/My Documents/CRB Tech Reports/2014-02-23 Bird net escape test/BirdNet.lyx

of the containers. A trail cam with infrared flash ([Reconyx PC800](#)) was set up to take an image of the containers every 5 seconds. At 19h on 2014-02-20 the lids of the containers were removed. At 22h lids were put back on the containers and all beetles within the field cage were collected. Beetles in each container were counted the following morning.

[Fiji \(ImageJ\)](#) was used to compile the still images from the trail cam into a time lapse video (avi format).

## 2 Results and Discussion

Within the 3 hour experiment, the escape rate for the container without bird netting was 88%. Escape rates for containers enclosed in 1, 2, and 3 layers of bird netting were 81%, 44%, and 81%, respectively (Table 1). These results show that half-inch bird netting is not very effective as a physical barrier for rhino beetles. The [time lapse video posted on YouTube](#) shows that even three layers of netting slows down escape of beetles by only a few minutes.

Despite the poor performance of the bird netting used in this experiment, the concept of using netting as a physical barrier to prevent rhino beetles from leaving or entering breeding sites is valuable and this should be researched further. The trick here is to find an optimal mesh size which will entangle the beetles much like how fish are caught with a gill net. Too large, and the beetles will pass through, as in this experiment. Too small and these powerful beetles will tear a hole, as we have seen with aluminum window screen.

## 3 Notes

- Just for fun, I decided to add a sound track to the slomo video. This was done using a Linux utility called **avconv**. The command line I used was:  
`avconv -i birdNet.avi -1 john-barry---born-free.mp3 -shortest -c copy CRBbirdNet.avi`  
Tips on using avconv can be found [here](#).



Figure 1: Bird netting. Scale is in inches.



Figure 2: Experimental setup.

Layers of bird netting	In container	Escaped	Entangled	Total
0	2	14	-	16
1	3	13	0	16
2	9	7	0	16
3	2	13	1	16

Table 1: Location of beetles at conclusion of the 3h experiment.