



Development of Barrel Traps

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Barrel traps are artificial CRB breeding sites contained in used 55 gallon oil barrels or similar sized containers. A chickenwire cover allows adult beetles to land on the trap and fall into it. But they cannot escape because the chicken wire prevents them from flying out. The capture rate for barrel traps is more than a magnitude higher than that of surrounding standard CRB pheromone traps. Trap capture rate can be further increased by more than 50% by addition of solar powered ultraviolet light emitting diodes.

1 Methods

Barrel traps are artificial CRB breeding sites contained in used 55 gallon oil barrels or similar sized containers (Figure 1). The barrel is loaded with decaying coconut material from a natural CRB breeding site containing all CRB lifestages. A chickenwire cover allows adult beetles to land on the trap and fall into it. However, beetles cannot escape because the chicken wire prevents them from flying out.

We deployed 24 barrel traps in the back yards of cooperators and visited these weekly. We placed an oryctalure pheromone dispenser in each trap when first installed. Initially, we censused all beetles in the trap by going through the breeding material. However this was very time consuming. The traps were modified by placing a galvanized or plastic pan underneath the chicken wire to capture

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C:/Documents and Settings/Administrator/My Documents/CRB Tech Reports/barrelTraps

newly arrived adults (Figure 2). Small holes drilled in the pan allow passage of odors emitted by the breeding material. During our weekly trap visit, we count and sex beetles in the pan and then dump them into the breeding material. When the breeding material has become depleted, we add several “pucks” which are 2 inch thick slices of rotting coconut logs.

We compared the trap catch rate of each barrel with those of standard CRB pheromone traps within a one km radius. We tested the utility of placing solar powered ultraviolet light emitting diodes (UVLEDs) on our barrel traps by placing them on a randomly selected half of our traps for a week, switching them to the other half of the traps on alternate weeks.

2 Results and Discussion

- Barrel traps caught a mean of 0.211 beetles per trap-day. In comparison, the mean capture rate for standard CRB pheromone traps within a one km radius of the barrel traps was 0.016. The difference is highly significant (p-value = $5.919e-7$; Welch Two Sample t-test). Thus, the barrel traps caught 13X as many beetles as the standard traps.
- Barrel traps fitted with solar powered UVLEDs captured 0.246 beetles per trap-day. In comparison, barrel traps without UVLEDs captured 0.160 beetles per day. The difference is significant (p-value = 0.022; Welch Two Sample t-test). Thus, barrel traps equipped with UVLEDs caught 54% more beetles than those without UVLEDs.



Figure 1: CRB barrel trap.

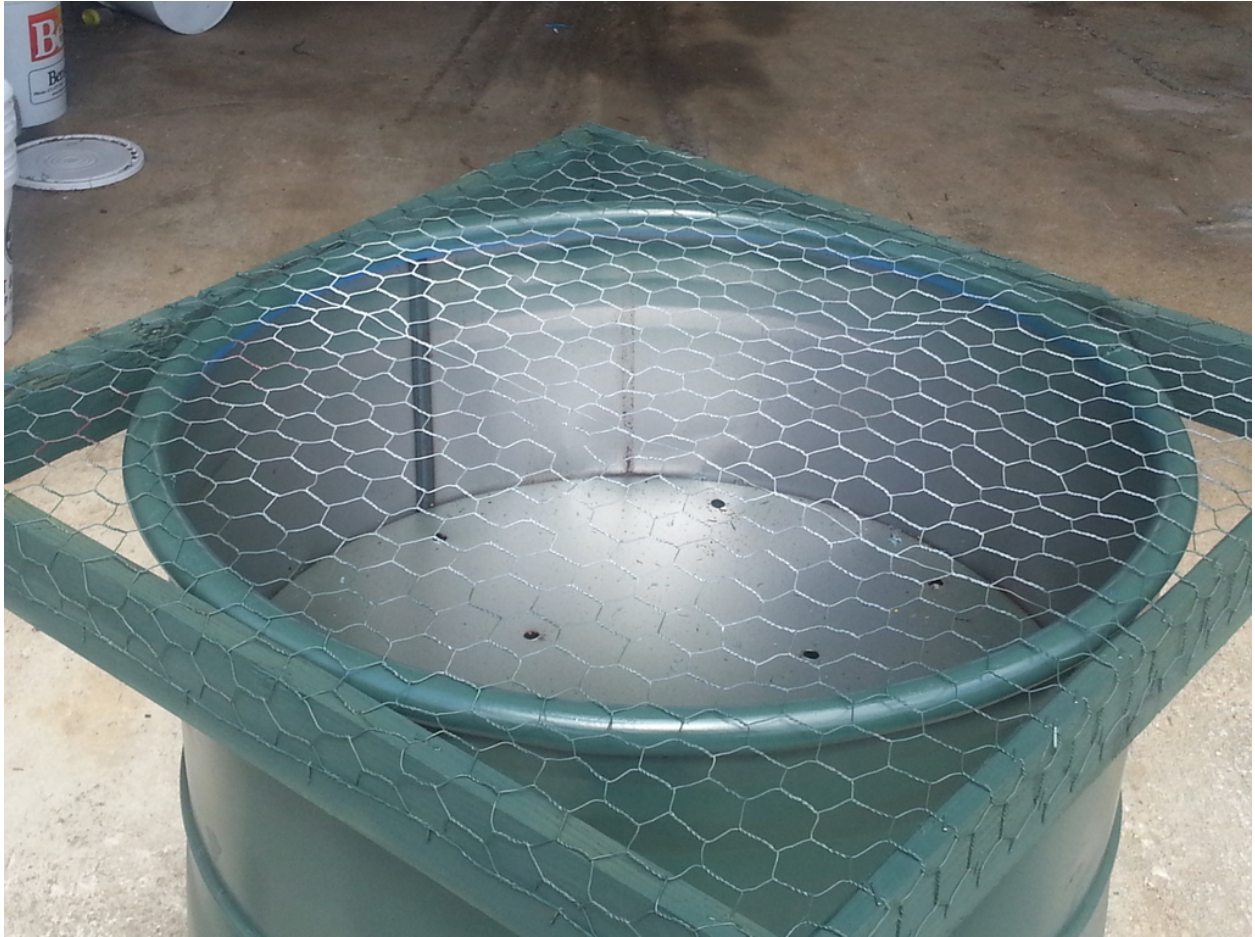


Figure 2: CRB barrel trap fitted with a pan to facilitate counting newly arrived adults.