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Evaluation of pheromone trapping protocols for red palm weevil *Rhynchophorus ferrugineus* Oliv. in coconut plantations.

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Red palm weevil (RPW) *Rhynchophorus ferrugineus* Oliv. is the most destructive pest of coconut, *Cocos nucifera* L. Feeding of the soft palm tissues by this concealed borer often leads to death of palm if timely curative measures are not taken. Often timely detection of infested palms is not possible thereby leading to a delay in the adoption of curative control measures. However, with the synthesis of the male produced aggregation pheromone (4-methyl-5-nonanol), for this pest by Hallett *et al.* 1993, the trapping of adult weevils using food baited pheromone traps has become a key component in surveillance and management strategies for RPW.

The present study aims at evaluating different trapping protocols for RPW in coconut plantations under the agro-climatic conditions prevailing in Goa, a coastal State in Western India. A series of field experiments were conducted between January, 2000 and November, 2001, wherein different trap colours, trap height from ground level, surface of the trap, longevity of food bait and suitability of insecticides for use in food baited pheromone trap were evaluated. In all the experiments a four window (1.5x 5 cm), high density polyethylene bucket (5lit) trap was used. All treatments were set 25m. apart from each other while a minimum distance of 100m was maintained between two replications. Also, wherever possible traps were rotated with in a replication in order to give equal opportunity for all treatments to trap the pest at a given spot there by minimizing the experimental error due to spot effect.

Trap Colour: In this experiment eight different trap colours viz. green, light blue, dark blue, transparent (white), pink, red, orange and yellow were evaluated. However, the average weevil captures were statistically at par indicating that trap colours did not influence the pheromone trapping efficiency.

Trap height: In this field experiment traps were set at ground level and there after at every half a meter up to two meters from the ground along the trunk of the palm. Here too weevil captures in traps at different heights, were statistically at par with traps at one meter height, which recorded the best average weevil captures of 30.4 weevils/trap. Hallett *et. al.* 1999 found that traps at ground level caught significantly more weevils than traps at five meter height, while traps at a height of ten meter did not captures any weevils.

Trap surface: In this trial two trap surfaces viz. with jute sack and without jute sack wrapping were evaluated. Here too, weevil captures were almost at par and traps with sack captured 18.50 (± 6.86) weevils, while those without jute sack captured 16.50 (± 7.93) weevils. Thus, trap surface did not significantly influence weevil captures.

Food bait longevity: This trial had six treatments wherein food bait (250 g coconut petiole) in the trap was replaced after 5, 10,15,20,and 30 days. Result showed that weevil captures were not impaired even when the food bait was not replaced for one month. However, water in the trap had to be replenished if traps were not serviced beyond 15 days.

Suitability of insecticide: It is essential to add insecticide in food baited pheromone trap so as to kill and retain the captured weevils in the trap and prevent their escape. A field trial comprising of eight insecticides viz. carbofuran 3G, chlorpyriphos 20EC nimbicidine, monocrotophos 36SL, phorate 10G, carbaryl 50WP, endosulfan 35EC and deltamethrin 2.8EC were evaluated for use in RPW pheromone traps. Cumulative weevil captures in varies treatments including control ranged from 7 to 25 weevils / trap, with carbofuran 3G registering the highest cumulative trap which was statistically superior to the other treatments. Similar results have been reported by Abraham and Nair (2001) from Kerala.

From the result presented and discussed above trap colour, surface and trap height did not significantly influence capture of RPW. However, food longevity trial showed that it is essential to service (change food and insecticidal solution) the pheromone trap at least once a fortnight so

as to maintain the efficiency of the pheromone trapping system. Further, carbofuran 3G (0.03%) when added to food baited pheromone traps recorded the best weevil captures as compared to other insecticide which registered low captures due to a repellent action.

References

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