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PHEROMONE TRAPS FOR THE MANAGEMENT OF RED PALM WEEVIL - A KEY PEST OF COCONUT

NATIONAL AGRICULTURAL TECHNOLOGY PROJECT

INTRODUCTION

Red Palm Weevil (RPW) *Rhynchophorus ferrugineus* Olivier (Coleoptera: Rhynchophoridae) is the most destructive pest of young coconut palms. Usually palms less than 20 years of age are attacked. The pest is a concealed tissue borer. Female weevils lay eggs on fresh wounds on the palm. The eggs on hatching produce damage inflicting grubs. Infested coconut palms exhibit one or more of the following symptoms.

DAMAGE SYMPTOMS

- ✓ Presence of tunnels on the trunk due to feeding by grubs.
- ✓ Oozing of thick brown to yellow fluid from the tunnels.

RPW infested coconut palm being eradicated

Collar region infestation by RPW resulting in toppling of the palm a decade later

- ✓ Appearance of frass (chewed up plant tissue) around the opening of the tunnels, categorized by a typical fermented odour.
- ✓ Production of gnawing sound by feeding grubs.
- ✓ Fallen empty pupal cases/ chewed up frass on the ground around the infested palm.
- ✓ Breaking of stem or toppling of crown in case of severe infestation.

At times, RPW enters the palm through the collar region and feeds on the bole just below the ground surface, making detection of the pest very difficult. Such palms are made hollow from within and may topple down several years after the initial attack.

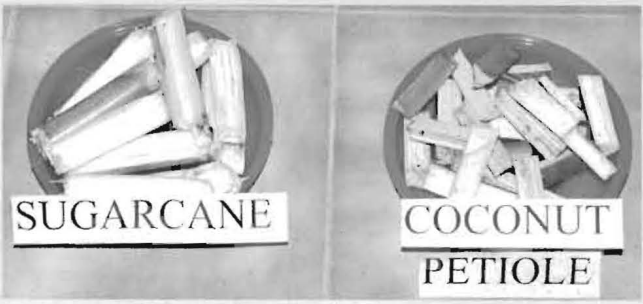
RPW can be effectively managed in coconut by adopting an Integrated Pest Management (IPM) strategy involving several measures as follows.

IPM MEASURES

- Phytosanitation (maintain clean plantation)
- Avoid making of wounds on the palms.
- Take up preventive insecticidal sprays (1% carbaryl 50WP or 0.1% endosulfan 35EC especially around leaf axils of young palms below 20 years of age, in endemic pockets.
- Maintain surveillance of the pest through pheromone trap captures.
- Mass trap RPW adults with pheromone traps in and around infested gardens.
- Adopt curative chemical treatment (stem injection with 1% carbaryl 50WP or 0.1% endosulfan 35EC) in infested palms. Repeat treatment after 15 days.
- Treat (drench) breeding sites (dead palms, stumps of cut palms etc.) with the above mentioned insecticides.

PHEROMONE TRAPPING

The use of food baited pheromone (ferrugineol) traps can be effectively incorporated into the management strategy against RPW. Continuous trapping of adult weevils for at least one

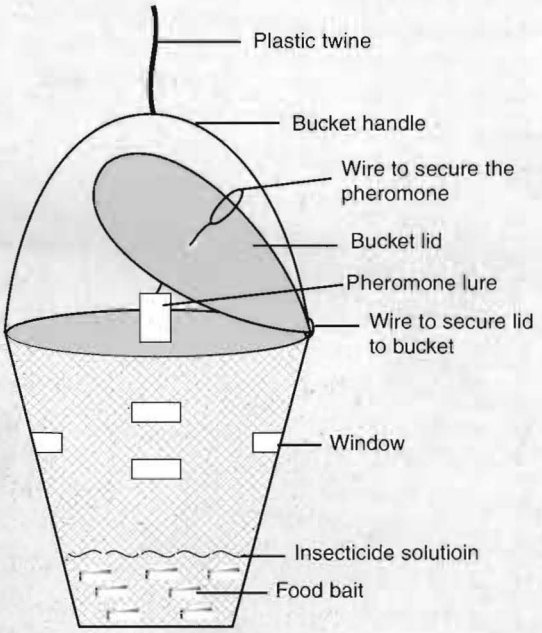


Potential food baits for use in RPW pheromone traps

year in an infested coconut plantation substantially reduces infestation levels. Usually, for every male weevil captured by using RPW pheromone traps, two female weevils are trapped. Most of these trapped female weevils are young, gravid and fertile. Thus, RPW pheromone traps not only serve as monitors, indicating the presence of the pest in and around the plantation, but also play a vital role in reducing RPW population levels in the field.

TRAP FABRICATION AND CONTENTS

RPW pheromone traps can be easily fabricated by using a five litre capacity plastic bucket with four openings (1.5 x 5 cm^2) cut equidistantly 4 cm below the upper rim of the bucket. Jute sack cloth should be wrapped around the outer surface of the bucket so as to provide better grip to the attracted weevils and facilitate their entry into the trap. The commercially available pheromone is to be hung to the inner side of the



RPW Pheromone trap model

bucket lid with a piece of wire. The lid has to be secured by tying it to the body of the bucket at a single point with wire. This will ensure that the lid with the costly lure does not fly off in the field. Further, a 30 cm long plastic twine may be attached to the handle of the bucket, which is used to set (hang) the trap in the field.

RPW pheromone traps set under shade of palm canopy ensures lure longevity

Besides the pheromone lure the trap also contains 200 g of fresh, green and tender petiole of coconut, which is mixed in one litre of water containing 10 g of insecticide (carbofuran 3G). While the food bait and pheromone lure act in combination to attract and trap RPW adults, the insecticide immobilizes and kills the trapped weevils.

OPERATIONAL TIPS

- Hang the trap under shade of palm/tree canopy, at a height of one metre above the ground.
- Care should be taken to ensure that the trap rests on the trunk/ stem and does not move or rotate freely with the wind.
- It is essential to change the food bait (coconut petiole) and insecticide solution at least once in 10 days and also discard the trapped weevils from the bucket. If it is difficult to obtain fresh food bait, the trap can be kept active for sometime (another 10 days) by adding water to the existing food bait. This would prevent the food bait from drying.
- Replace the pheromone only when most of the chemical is exhausted and less than five per cent of the lure is intact. Usually, under the agro climatic conditions prevailing in Goa, ferrolure

Spray young palms with insecticide (0.1% endosulfan 35 EC) before initiating mass trapping

+ 800 mg lasts for about five to six months in the field.

- In Mass Trapping Programmes (MTP) trap density of one trap for 1-2 hectares of coconut plantation is recommended. Where as, in surveillance programmes one trap can be used to monitor an area of about 100 ha.
- Trap colour does not influence weevil captures and therefore buckets of any colour can be used to fabricate the trap.
- In endemic plantations where MTP is initiated, it is desirable to spray young palms around the leaf axils with 0.1% endosulfan 35EC @ 2L /palm before start of mass trapping. This prevents egg laying and also enhances the trapping efficiency.
- It is desirable to initiate mass trapping of the pest on a collective basis simultaneously by a group of farmers with adjacent plantations.

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