

Coconut Rhinoceros Beetle

Pests and Diseases of American Samoa

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Introduction. The coconut rhinoceros beetle, *Oryctes rhinoceros* (L.), has been a pest of coconuts and other palms in the South Pacific since its accidental introduction into Samoa from Sri Lanka in 1909. Rhinoceros beetle is mainly a pest of coconut and oil palms; but it also attacks other palm species.



Damage to coconut palm

Damage. Coconut rhinoceros beetle adults damage palms by boring into the center of the crown, where they injure the young, growing tissues and feed on the exuded sap. As they bore into the crown, they cut through the developing leaves. When the leaves grow out and unfold, the damage appears as V-shaped cuts in the fronds or holes through the midrib.



Adult

Life Cycle. Eggs are laid and larvae develop in decaying logs or stumps, piles of decomposing vegetation or sawdust, or other organic matter. Eggs hatch in 8-12 days, and larvae feed and grow for another 82-207 days before entering an 8-13 day nonfeeding prepupal stage. Pupae are formed in a cell made in the wood or in the soil

beneath where the larvae feed. The pupal stage lasts 17-28 days. Adults remain in the pupal cell 17-22 days before emerging and flying to palm crowns to feed. The beetles are active at night and hide in feeding or breeding sites during the day. Most mating takes place at the breeding sites. Adults may live 4-9 months and each female lays 50-100 eggs during her lifetime.



Larva

Natural Enemies. Rhinoceros beetle eggs, larvae, pupae, and adults may be attacked by various predators, including pigs, rats, ants, and some beetles. They may also be killed by two important diseases: the fungus *Metarhizium anisopliae* and the *Oryctes* virus disease.



Larva infected with *Metarhizium anisopliae*

Management. Rhinoceros beetles can be controlled by eliminating the places where they breed and by manually destroying adults and immatures.

- Chop and burn decaying logs or break them up and destroy any rhinoceros beetles developing inside.
- Cut stumps as close to the soil surface as possible.
- Dead, standing coconuts should be felled, chopped, dried, and burned.
- Rhinoceros beetles do not usually lay eggs in potential breeding sites that are obscured by growing vegetation. Vines or ground covers can be planted or allowed to grow over logs or stumps that cannot be destroyed.
- Piles of dead leaves or grass can be composted, used for mulch, burned, or spread on the ground in a thin layer.
- Compost piles should be maintained properly. When turning compost piles or applying compost to plants, destroy any rhinoceros beetles found. It takes longer for rhinoceros beetle larvae to develop than it takes to make compost, so properly maintained compost should not serve as a source of rhinoceros beetles.
- A hooked wire can be used to extract and destroy rhinoceros beetle adults feeding in palm crowns.

In many countries, the fungus *Metarhizium anisopliae* or the *Oryctes* virus are used to control the rhinoceros beetle. More recently a chemical attractant, ethyl-4-methyloctanoate, has been used in traps to attract and kill the beetles. Both *Metarhizium anisopliae* and the *Oryctes* virus are present and helping to reduce rhinoceros beetle populations in American Samoa; however, these pathogens and the attractant have not yet received approval from the United States Environmental Protection Agency for use as pesticides to control the rhinoceros beetle.



Breeding site in decaying leaves.



Breeding site in coconut log.



Females (left) tend to have shorter "horn" and fuzzy posterior.

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