



## Management of Invasive Pest of Coconut: Coconut Mite, *Aceria guerreronis* Keifer

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### Abstract

The coconut tree is known as the “Kalpavriksha” or “Tree of Paradise” because every portion of the coconut is valuable. The rhinoceros beetle, coconut mite, red palm weevil and coconut black-headed caterpillar are the most destructive insect pests of coconut that are of national concern. In many nations the coconut mite, *Aceria guerreronis* Keifer, is the most notorious and significant pests of coconut fruits. It has disseminated to most places of the world where coconuts are produced. The effect of the mites in the affected areas shows that the spread of Coconut mite to these significant producers might result in extremely high losses. IPM is a comprehensive strategy to lessen the impact of pests and keep the ecosystem in balance. IPM technology clearly offers an edge over traditional management techniques. A sustainable agroecosystem is more practical, affordable and environmentally beneficial.

**Keywords:** Coconut mite, Integrated pest management, Notorious pest, Traditional management

### Introduction

Over the years, several types of palms have been cultivated, with the coconut being one of the most significant (*Cocos nucifera* L.). *Cocos nucifera* L., a member of the Palmaceae family, is a significant plantation crop that is grown mostly in tropical as well as in subtropical regions of the world. This coconut tree supports so many people, either directly or indirectly; it is one of the ten most beneficial plants in the world and supplies nourishment for millions. The tree also known by other names such as “Kalpavriksha,” “Tree of Life,” “Tree of Heaven,” or “Tree of Plenty” because of its many uses. Annual production estimated is 59.98 million tonnes of nuts, more than 93 nations worldwide cultivation of coconuts in area of twelve million hectares. Annual production reported was 18 million tonnes, Indonesia leads the world in the production of coconuts, with the Philippines coming in second with 15.86 million tonnes. At 10.56 million tonnes, India is third in the world for coconut output. Many major Indian states, including Kerala, Assam, Maharashtra, Telangana, West Bengal Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, and Goa are known for their coconut production. India employs 50%

of its yearly harvest for culinary and religious purposes, 35% for khopra, 2% for the creation of coconut enriched goods, 11% for tender uses and 2% for the production of seeds. Kerala is the top-producing state of coconuts among the Indian states. A multipurpose commodity, coconut is said to as a complete food due to its high calorie, vitamin and mineral content. The major forms of consumption are coconut oil, coconut water, and khopra meal. The coconut seed or kernel is a great source of nutrients since it contains copper, calcium, magnesium, zinc, iron, manganese and B-complex vitamins including folates, niacin, thiamine, riboflavin, and pyridoxine are also abundant in it. Both the flesh and water of the coconut are significant sources of potassium. Because India has an unrivaled qualitative edge in the coconut oil industry, coconut is primarily cultivated for oil in our nation. Many coconut pests also spread widely, perhaps as a result of the widespread use of coconuts worldwide. The coconut mite (CM), *Aceria guerreronis* Keifer, coconut leaf beetle, *Brontispa longissima* Gestro, and the palm red mite, *Raoiella indica* Hirst and are three recent invasive pests linked to coconut that has caused concern. This phytophagous mite is the most infamous and significant

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pests of coconut in several nations and has spread to most coconut-producing regions worldwide. It is now increasingly important to manage these insect pests since Integrated Pest Management (IPM) is a management system of pest population that engaged all necessary technologies in a compatible way to decrease the pest population level below that causes economic loss. Integrated pest management (IPM) is a comprehensive approach to decreasing the effects of pests and maintaining the environmental equilibrium. IPM technology unquestionably has a benefit over conventional management practices. A sustainable agroecosystem is more useful, economically sound and advantageous to the environment.

### Taxonomic Position

Scientific name : *Aceria guerreronis* Keifer

Phylum : Arthropoda

Subphylum : Chelicerata

Class : Arachnida

Superorder : Acariformes

Suborder : Prostigmata

Family : Eriophyidae

Genus : *Aceria*

Species : *guerreronis*

### Host

There are just three additional palm species from which Coconut Mite has been documented, outside coconut. *Lytocaryum weddellianum* and *Cocos weddelliana* were discovered in Brazil being attacked by Coconut mite, while *Syagrus romanzoffiana* (Cham.) was discovered in Southern California, USA. Only plants in nurseries were affected by Coconut Mite in both instances.

### Distribution

Keifer (1965) characterized the mite of Coconut in 1965 using samples collected in the region of Mexican state of Guerrero. It is also found in Africa, Asia, North, South, Central and the Caribbean of America, and also in European countries.

**Damaging stage:** Nymphs and adults

### Life Cycle

The coconut mite is a long, yellowish-white eriophyid that resembles a worm. Adult females measure 36-52 mm in width and 205-255 mm in length (Keifer, 1965). Eggs are tiny, circular oval and white. All developmental phases are quite similar, with the exception of size and the existence of genital apertures in adults. According to Navia et al. (2009), there are morphometric differences across people from the Africa Asia and Americas. According to scientists, coconut immature growth may be finished in 8-10.5 days and each female can produce up to 66 eggs. The juvenile phase of coconut mite contains the egg, larval and one nymphal stage, just like other eriophyids.

### Nature of Damage

Early stages of buttons that have been pollinated by mites seek refuge under or near around the perianth. After the duration of month, the formation of triangular yellow spots and the appearance of longitudinal patches below the

perianth are the first signs of a mite infestation. The surface of the nut then develops wartings and longitudinal cracks as these spots turn brown. This mite infestation also causes the button to dry up and shed.

### Integrated Pest Management

The scientist often use chemical control to manage coconut mite that could be difficult because of its high reproductive capacity, rarely seen protective habitat, and the possibility of permanent infestation. Another difficulty is that several types of popular coconut are quite tall, which makes it difficult to apply pesticides.

### Cultural Method

- The damaged palm's dropped buttons should be collected and destroyed.
- To prevent unauthorized entrance, grow an intercrop (4 crops year<sup>-1</sup> of sun hemp) and a casuarina-covered shelter belt around the coconut garden.
- Provide proper irrigation.
- Apply urea, superphosphate and muriate of potash at a rate of 3.5 kg palm<sup>-1</sup>year<sup>-1</sup>. To strengthen the plant's resistance to the mite, an increased amount is advised.
- Application of micronutrients such as borax (50 g), manganese sulphate (0.5 kg) and gypsum (1.0 kg) to the soil and 200 ml tree<sup>-1</sup> micronutrient solution.

### Biological Control

- According to reports, the entomofungal pathogens *Hirsutella thompsonii* and *Verticillium lecanii* show promise in controlling the mites.

### Chemical Control

Spot the use of environmentally beneficial botanicals.

- Azadirachtin 1% (5 ml l<sup>-1</sup> of water) for the first round.
- Round 2: 30 ml of Neem oil and 30 ml of Teepol in one litre of water.
- 40 EC Triazophos 5 ml l<sup>-1</sup> or 25 EC of carbosulfan 1% 5 ml l<sup>-1</sup> of neem azal in alternation with 2 ml l<sup>-1</sup> as a spot application.
- Application of 5 kg of neem cake palm<sup>-1</sup> each year.

### Conclusion

IPM is a comprehensive strategy to lessen the impact of pests and keep the ecosystem in balance. IPM technology clearly offers an edge over traditional management techniques. In a sustainable agro-ecosystem, it is more practical, affordable and environmentally beneficial.

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