

## COCONUT ERIOPHYID MITE, *Aceria guerreronis* KEIFER AND ITS MANAGEMENT

N.R. TOKE, D.L. PATIL AND S.C. TAYADE

Department of Agricultural Entomology, N.M. College of Agriculture, Navsari Agricultural University, NAVSARI (GUJARAT) INDIA

Coconut, commonly referred to as “Tree of Life” as well as “KalpaVriksha” provides livelihood to billions of people across the world. Globally, coconut occupies an area of 12 million hectares with a total production of about 56 billion nuts. India, Indonesia, Philippines and Sri Lanka are major coconut-growing countries, contributing 78



per cent of the total world production. The four southern coconut growing states, namely, Kerala, Tamil Nadu, Karnataka and Andhra Pradesh account for 90 per cent in total area and production. Coconut provides food, drink, medicine and altogether health to millions of consumers as well. This crop is attacked by various pests, of which, rhinoceros beetle, red palm weevil, leaf-eating caterpillar, etc. are important. Of late, incidence of nut infesting eriophyid mite, *Aceria guerreronis* Keifer (Eriophyidae: cari) has become a major problem in many of the coconut-growing countries.

The eriophyid mite, *Aceria guerreronis* Keifer belonging to family Eriophyidae was first identified in Guerrero state of Mexico during 1960. It was first described in 1965 from specimens collected from Guerrero state of Mexico (Keifer, 1965), but it was unknown in Indian subcontinent till 1984, when it was first recorded from Srivilliputhur area of Tamil Nadu. Later the spread was reported from several countries in South and Central America, Africa, the Carribean islands, Pacific and Indian ocean areas. In India, the mite attained a major pest status in the three peninsular states of India viz., Kerala, Karnataka and Tamil Nadu and it is spreading towards north also (Sathiamma *et al.*, 1998). It has drawn national attention as a threat to the coconut plantation (Sathiamma *et al.*, 1998 and Mohana Sundaram *et al.*,

1999).

The coconut mite, *Aceria guerreronis* Keifer, attacks young fruits of the coconut palm, *Cocos nucifera* L., to which it is almost exclusively confined. The mites are small, with the largest stage around 250  $\mu$ m in length, but they often build up extremely large and dense populations, in which case their feeding causes scarring and distortion of the fruits, and may cause premature fruit drop. It is one of the worst arthropod pests of coconut palm, whether grown as a crop tree or as an ornamental, and is the only



eriophyid mite that is a serious pest of coconut palm. It is distributed in many tropical countries where coconuts grow.

### Description of mite:

Very small, elongate, wormlike, creamy white, microscopic in nature, with two pairs of legs both in nymphs and adults. These mite cannot be seen distinctly with the naked eye. At this magnification, the colonies appear as vague silvery patches. Individual coconut mites appear small even when viewed under standard stereoscopic microscopes. Coconut mite

infestations are generally diagnosed by the appearance of their damage, confirmed by finding specimens of the mite on the fruits. Positive identification of the mite can be made by a specialist examining specimens mounted on slides under a compound microscope.

### Nature of damage:

The nymphs and adults feed on the meristematic tissues of growing nuts under the perianth by desapping the soft tissues. Initial symptoms appear in the form of small, pale white or yellow, inverted triangular patches just below the perianth. As the feeding activity increases, it results in physical damage leading to necrosis. In the severely damaged condition, brown patches appear. As the nuts mature, longitudinal fissures and splits occur on the outer surface of the husk. Occasionally, brownish gummy exudate oozes out from the fissures of the nuts. Severe infestation leads to malformed nuts with hardened husk, resulting in reduced copra and fibre yield. Mites



occur in large number in two to six months old buttons. Palms of all ages and nut colour are affected by this mite. In the severely infested nuts, the husk becomes thick and hardened, making dehusking difficult, besides drastic reduction in fibre yield. The quantity of reducing sugars and the acidity content were very low in the highly damaged nuts. The peroxidase value was found to be high in severely damaged nuts indicating that such nuts become quickly rancid. The nuts show typical triangular, brown, warty skin after maturity, deformed and 'T' shaped split may appear on the surface.

#### Life history:

Life cycle of this mite includes egg, two larval instars and an adult stage. Eggs are shiny white and globular in shape which hatch into larvae (protonymph) in three days. The second instar larva is called nymph which subsequently moults into adults. Adult mite is very minute, measuring 200-250  $\mu\text{m}$  in length and 35-50  $\mu\text{m}$  in width, with two pairs of legs found in the anterior region of the body. Each female can lay approximately 30-50 eggs. It takes about 10-12 days to complete one life cycle from egg to adult. Each colony contains hundreds of eggs, larvae, nymphs and adults. Mite population is usually higher during summer months. The dispersal of mite is primarily through wind.

#### Yield loss:

In general, infestation by mite has not resulted in reduction of yield of nuts. In a few cases, the shedding of infested buttons (1 – 4 months old) has been noticed. But the shedding of young buttons due to eriophyid mite ranged from 5 to 10 per cent only. Reduction in the copra yield ranged from 15-42 per cent in the severely damaged nuts. A loss of 40 per cent in fibre yield has also been reported. Further, hardening of husk in highly damaged nuts cause 40 per cent increased the time for dehusking ([www.tnau.ac.in/cpps/Home/technologies/cocoerio](http://www.tnau.ac.in/cpps/Home/technologies/cocoerio)).

#### Integrated approach for the management of Eriophyid mite *Aceria (eriophyes) Guerreronis* (keifer) on Coconut:

- Removal of dried spathes, inflorescence parts, fallen nuts etc. and burying in the soil or by burning to minimize the pest inoculum. Crown cleaning shall be taken up periodically
- FYM or Compost 50 kg per palm per year

- Neem cake 5 kg per palm per year
- NPK – 500:320:1200 g per palm per year ( 1.1 kg urea, 2 kg SSP and 2kg murate of potash/palm/year).
- Magnesium sulphate 500g per palm per year
- Borax 50 g per palm per year

- Gypsum 1 kg per palm per year.
- Spraying of neem formulation (0.15% or 1500 ppm) @ 5 ml/litre of water also controls the pest.
- Spraying biopesticides on the bunches 2% neem oil - garlic emulsion (20ml neem oil + 20g garlic + 5g bar soap in 1 litre of water). Emulsion has to be prepared on the same day of application itself.
- Other neem based pesticides at 0.004% (Azadirachtin). If the pesticide formulation contains 1% Azadirachtin, 4ml has to be used in 1 litre water.
- Wherever spraying is difficult root feeding may be resorted to with Azadirachtin 5% formulation (7.5ml+7.5ml water) or Azadirachtin 1% formulation (10ml + 10ml water).
- Spraying has to be done 3 times a year - December-February, April-June and September-October. While spraying, ensure that the spray fluid falls over the perianth region especially on button and tender nuts. On an average 1-1.5 litre spray fluid is required per palm. Care should be taken to harvest mature bunches before spraying.
- Combination treatment containing Neem formulation (5ml) with entomopathogenic fungus *Hirsutella thompsonii* (5g) per tree is also effective.
- Spraying of sulphur 80% SP @ 6 grams/litre which gives good control of the mite and also it is the cheapest chemical
- Spraying of profenophos 50% EC @ 5 ml or triazophos 40% EC @ 5 ml or methyl demeton 25% EC @ 4 ml or dicofol 18.5% EC @ 6 ml per litre of water or 20 ml neem oil + extract from 20g garlic + 5g soap in one litre of water exercises good control of the pest.
- Root feeding of monocrotophos (36 WSC) @ 10 ml + 10 ml water per tree also reduces the pest.
- The chemical spray treatment need to be given at 7 days interval and repeated depending on the need. Avoid application of the same chemical and alternate the above treatments.
- Root feeding of monocrotophos may be given in severe cases of infestation.
- All the palms in the locality shall have to be treated irrespective of the infestation.