Journal of Tropical Agriculture 44 (1-2): 76-78, 2006



Short communication

# Germination and seedling characters in coconut (*Cocos nucifera* L.) as affected by eriophyid mite (*Aceria guerreronis* Keifer) infestation

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Received 21 March 2006; received in revised form 19 July 2006; accepted 10 August 2006.

**Abstract**

An experiment was conducted at Vellayani during 2002–'03 to study the effects of eriophyid mite (*Aceria guerreronis* Keifer) infestation on germination and seedling characters of coconut. Infested nuts (five damage intensities) were sown in a nursery and their germination and seedling characters evaluated. Germinability of nuts per se was not substantially altered by the mite attack. However, collar girth and leaf area of the seedlings were significantly reduced. Although nuts with less than 25% surface damage had no adverse impact, those with more than 25% surface damage and distortion resulting from severe infestation impaired seedling vigour.

**Keywords:** Beak emergence, Collar girth, Leaf area, Seed nut.

The eriophyid mite, *Aceria guerreronis* Keifer, is the most important acarid pest causing economic loss to the coconut growers of Kerala, where it was first reported in 1998 (Sathiamma et al., 1998). *A. guerreronis* lives and multiplies under the perianth of tender nuts and feeds by sucking sap from the meristematic zone. Initial symptoms appear as triangular patches below the base of tepals, which when removed show dusty patches with thousands of mites (Julia and Mariau, 1979). Feeding in the meristematic zone causes uneven growth resulting in distortion and stunting due to necrosis and suberisation (Moore and Howard, 1996). Since extensive damage has been caused to coconut palms in the southern states of India (Nair et al., 2000), it has now become difficult to select healthy seed nuts without mite damage for nursery stock production, forcing many nurserymen to use mite infested nuts for producing planting stock. However, no data are available on the quality of seedlings produced from such infested nuts. Therefore, an experiment was conducted to evaluate the effects of mite infestation on germination and seedling characters of coconut.

Mature seed nuts were collected from 25-year-old mite infested West Coast Tall palms in the Instructional Farm, Vellayani during April-May 2002. The nuts were grouped into five categories depending on the extent of infestation (Fig. 1) and were heaped under partial shade until the husk was well dried. Twenty five nuts from each damage category were sown in the nursery during June 2002 adopting a spacing of 30 cm between rows and 30 cm between nuts. Each category was replicated in five rows. The nursery was irrigated once in two days during summer and was kept weed-free. Nuts that did not germinate within six months after sowing were discarded. Days taken for germination was recorded weekly up to six months and to assess the seedling vigour, seedling height, collar girth, leaf number, and total leaf area were measured. Total leaf area was calculated using the equation, $Y= 27.3861+ 0.6139x$, where $Y$ is the leaf area, and $x$ = the product of length and breadth of lamina for unsplit leaves (Ramadasan et al., 1980). The data were subjected to analysis of variance.

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*Figure 1.* Nuts belonging to different damage categories (1 to 5; A) and seedlings from such nuts (B) [1 =nuts with no mite damage, 2= nuts with superficial mite damage (1 to 10%), 3= nuts with significant mite damage but not much smaller(11 to 25 %), 4= nuts with significant mite damage, nuts smaller with some distortion (26 to 50 %), 5 = nuts very heavily attacked, highly reduced in size, and often greatly distorted (51 to100%)].

Beak emergence occurred 10 weeks after sowing and more than 80% of it was completed in about 6 months. Although full germination (100%) was noted in categories 1 and 2 only (i.e., less than 10% damage), differences in this respect were not statistically significant (Table 1). The relatively high germination percentage (80 to 100%) reported in this study signifies that mite infestation probably did not hamper germinability of the seed nuts, which is consistent with the findings of Marimuthu et al. (2003). Despite this, seedling growth at 6, 9, and 12 months after sowing showed considerable variations among the damage categories (Table 1), implying differences in seedling vigour, an important criterion that is used for planting stock selection. In particular, height and collar girth were consistently more in categories 1 and 2 compared to categories 4 and 5. Although mean number of functional leaves (green) at 12 months (range: 6 to 6.88) did not differ substantially among the seed nut categories, leaf area per seedling was relatively small for categories 4 and 5, signifying variations in leaf size and photosynthetic surfaces available to the seedlings. Early splitting of leaves also was noted in seedlings belonging categories 1, 2, and 3 (data not presented). Hence, it is reasonable to conclude that modest (less than 25%) surface damage of seed nuts due to eriophyid mite infestation has no profound adverse impact on germination and seedling growth/vigour. Nuts belonging to categories 2 and 3 can, therefore, be safely

*Table 1.* Germination and growth of seedlings from eriophyid mite infested coconuts at Vellayani, Kerala.

| Damage category[1] | Germination (%) at 6 MAS[2] | Height (cm) | | | Collar girth (cm) | | | Number of leaves | | | Total leaf area at 12 MAS ($cm^2$) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 9 | 12 | 6 | 9 | 12 | 6 | 9 | 12 | |
| 1 | 100 (90) | 69.9 | 123.4 | 184.1 | 6.9 | 10.5 | 15.9 | 2.1 | 4.3 | 6.5 | 6218 |
| 2 | 100 (90) | 43.0 | 98.9 | 182.4 | 7.0 | 10.4 | 14.1 | 2.4 | 5.1 | 6.8 | 5635 |
| 3 | 80 (81) | 39.9 | 95.5 | 151.4 | 6.8 | 10.2 | 14.0 | 2.5 | 4.9 | 6.9 | 4494 |
| 4 | 80 (80) | 27.4 | 62.6 | 148.3 | 5.4 | 8.6 | 12.8 | 2.4 | 4.1 | 6.0 | 3421 |
| 5 | 80 (78) | 22.5 | 47.2 | 120.3 | 4.4 | 7.4 | 12.0 | 1.6 | 3.5 | 6.1 | 3394 |
| CD (0.05) | NS | 13.59 | 26.08 | 28.8 | 1.89 | 1.34 | 1.93 | NS | 0.95 | NS | 1438 |

[1]Damage category 1=nuts with no mite damage, 2= nuts with superficial mite damage (1 to 10%), 3= nuts with significant mite damage but not much smaller (11 to 25%), 4= nuts with significant mite damage, nuts smaller with some distortion (26 to 50%), 5= nuts very heavily attacked, highly reduced in size and often greatly distorted (51 to 100%).

Values for height, collar girth, and number of leaves correspond to 6, 9, and 12 months after sowing (MAS). [2]Values after angular transformation are given parenthetically.

used along with healthy nuts for nursery stock production. This is consistent with the observation that copra output from nuts belonging to categories 2 and 3 were similar to that of undamaged nuts (Paul, 2001).

## Acknowledgements

The authors thank Dr. K. Saradamma, formerly CCPI, NATP on CEM for the help rendered during the study.

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