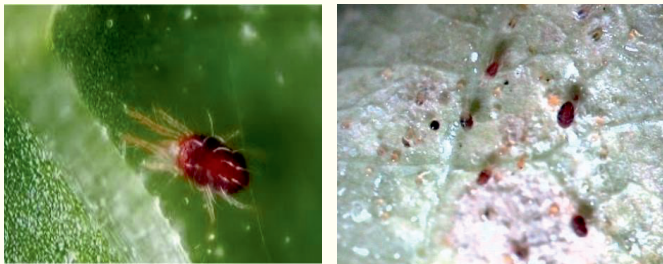


Cassava is an important tuber crop in India, which is cultivated in an area of 0.189 million ha with a production of 6.90 million tonnes (FAO, 2022). Tamil Nadu, Kerala, Andhra Pradesh, Meghalaya, Assam, Karnataka and Nagaland are the major cassava growing states in India. Utilization pattern of cassava has changed dramatically in recent years largely due to its use as a primary raw material for starch, sago, adhesive and animal feed industries as well as its potential for biofuel production. Adaptability of cassava to marginal environments, its contribution to household food security as well as flexibility in mixed farming system makes cassava a viable option for cultivation. Productivity of cassava in India (36.12 t ha⁻¹) is more than the world (10.31 t ha⁻¹) due to the adoption of improved varieties, crop production and crop protection measures. Productivity of cassava can further be enhanced by managing the biotic and abiotic factors with integrated approach. Among the biotic factors, mites cause considerable yield loss in cassava.



Mite infestation in cassava

Attacks are usually seen in dry weather. These are the most destructive pests that attack cassava leaves. Infestation starts from mature lower leaves. There are two types of eight-legged mites that occur in the underside and the top of leaves. Attacks by *Tetranychus cinnabarinus* and *Tetranychus neocaledonicus*, in the underside of the leaves, can cause the leaves to appear discolored, weak, and dry and fall off. *Eutetranychus orientalis* and *Oligonychus biharensis* attack the upper part of the leaves. As a result of their bout, the leaves lose their green color, get rusted and look like leather and gradually curl up. Webbing also often seen in the shoots.

Life cycle

The eggs are attached to fine silk webbing and hatch within about three days. The life cycle consists of the egg, the larva, two nymphal stages (protonymph and

deutonymph) and the adult. Under optimal conditions (approx. 27 °C), spider mites complete their development in five to twenty days. There are many overlapping generations per year.

The adult female lives for two to four weeks and can lay several hundred eggs over the course of her life. The two-spotted spider mite prefers the hot, dry weather of the summer and fall months, but can occur year-round. Overwintering females hibernate in ground litter or under the bark of trees or shrubs.

Mode of spread

The mite infestation in cassava is influenced by various factors, such as: the use of infested planting materials, the proximity of infested plants and the lack of appropriate management practices. Over short distances, mites can be blown by the wind, washed along in irrigation water, and attach themselves to field workers (clothing, tools).



Attack in upper and lower leaf surfaces



Webbing in cassava leaves



View of mite infested cassava field

Long distance movement is usually associated with the movement of vegetative planting material (setts).

Monitoring and detection

Early detection of pest infestation is very important. The extremely small size of the red spider mite makes it very difficult to detect. Check regularly for signs of leaf damage, then use a hand lens to look for spider mite nymphs and adult mites on both sides of the leaves. Another strategy: take a white sheet of paper and hold it under the leaves. Tap the leaves lightly and if there is an infestation you will see the mites slowly running across the paper. If 10 or more of the pests are found in a sample, control measures are necessary.

Management practices

a. Cultural and Mechanical methods

- Monitoring and scouting to detect the infestation
- Pruning and burning of infested branches
- Removal of weeds/alternate host plants from in and around cassava fields
- Avoid the use of planting materials from infested cassava fields
- Maintenance of field hygiene and sanitization of farm equipments
- Fallowing of land and crop rotation
- Spray heavily with water at the beginning of the infestation, followed by a 1% magnesium sulfate spray on the leaves

b. Biological methods

- Conservation or introduction of natural predatory mites, *Phytoseiulus persimilis* or *Amblyseius spp.*

c. Biopesticides/Chemical methods

- Spray ICAR-CTCRI developed biopesticide *Nanma* @ 1 % two times at five days interval or Neem oil @1 to 1.5 % mixed with soap solution 0.5 % in five days interval
- Spray any of the entomopathogenic fungi- *Hirsutella* or *Lecanicillium* at the rate of 20 grams per liter of water (minimum 10⁸ cfu)
- During heavy attack, spray entire field with spiromesifen 22.9 SC @ one ml/liter of water

Precautions to be followed

- Regular monitoring of the crop for mite infestation and its natural enemies
- Phyto-sanitation of planting materials, harvested produce *etc.*, before transporting to other places/states
- Intensive field survey to find out efficient predators/ pathogens of the pest
- Avoid spray of acaricide/ insecticide unless mite infestation is confirmed as it may destroy natural enemies
- Follow the waiting period of 2-3 weeks after the spray of acaricide to release predatory mites
- At the early stage of mite infestation, spray safer pesticides like *Shreya*, *Nanma*, Fish oil rosin soap, *Azadirachtin etc.* to conserve natural enemies
- Community approach is to be adopted by farmers for the successful management of mites in cassava

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Integrated management of mites in cassava

By

E.R. Harish, T. Makesh Kumar, B.G. Sangeetha, H. Kesava Kumar, L.S. Rajeswari

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(भारतीय कृषि अनुसंधान परिषद्)

श्रीकार्यम, तिरुवनन्तपुरम 695 017, केरल, भारत

ICAR-Central Tuber Crops Research Institute
(Indian Council of Agricultural Research)

Sreekariyam, Thiruvananthapuram 695 017, Kerala, India

Tel. No. : 91 (471)-2598551 to 2598554; E-mail: director.ctcri@icar.gov.in, Website: <https://www.ctcri.org>

