



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
© Agronomy
NAAS Rating (2026): 5.20
www.agronomyjournals.com
2026; 9(1): 279-280
Received: 12-10-2025
Accepted: 27-11-2025

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Mite infestation in mulberry and its impact on crop loss in selected districts of Karnataka

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DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i1d.4651>

Abstract

Mulberry (*Morus* spp.) is the sole food plant of silkworms, and its productivity and leaf quality play a vital role in successful sericulture. Among the various biotic stresses, infestation of mites has emerged as a major constraint affecting mulberry cultivation in several sericulture-growing regions of Karnataka. The present study assesses the extent of mite infestation and associated crop loss across selected districts, namely Ramanagara, Bengaluru, Tumakuru, Kolar, Bidar, Maddur, and Chitradurga. The results revealed considerable variation in infestation levels, ranging from 1-5% in Bidar to as high as 25-30% in Kolar. Correspondingly, crop loss due to mite damage varied from less than 5% to 15%, with higher losses observed in districts recording severe infestation. Districts such as Kolar, Tumakuru, and Maddur showed comparatively higher infestation and crop loss, while Bidar recorded minimal damage. Mite infestation was found to adversely affect leaf yield and quality, thereby posing a serious threat to silkworm rearing and cocoon production. The study highlights the need for timely monitoring and adoption of integrated mite management practices to reduce losses and ensure sustainable mulberry production in the region.

Keywords: Mulberry, mite infestation, crop loss, sericulture, Karnataka

Introduction

Mulberry (*Morus* spp.) is the sole and indispensable food plant of the silkworm (*Bombyx mori* L.), and the quantity as well as quality of mulberry leaves plays a decisive role in determining silkworm growth, cocoon yield, and silk quality. According to Krishnaswami (1978) ^[5] and Dandin, Jayaswal, and Giridhar (2003) ^[3], any deterioration in leaf moisture, nutrient content, or palatability directly affects larval health and cocoon productivity. Hence, protection of mulberry from pests and diseases is critical for sustainable sericulture.

Among the various biotic stresses affecting mulberry, mite infestation has emerged as one of the most serious constraints in recent years. Govindan and Devaiah (1995) ^[4] reported that sap-sucking mites such as the red spider mite (*Tetranychus* spp.), yellow or broad mite (*Polyphagotarsonemus latus*), and pink mite (*Oligonychus ilicis*) cause extensive damage by sucking cell sap from leaf tissues. Their feeding results in characteristic symptoms including stippling, chlorosis, bronzing, leaf curling, scorching, and premature leaf fall. Rangaswamy *et al.* (1976) ^[6] observed that severe mite infestation significantly reduces effective leaf area and overall leaf yield.

Several studies have demonstrated that mite infestation adversely affects the physiological and biochemical quality of mulberry leaves. Sannappa *et al.* (2001) ^[7] and Sharma and Kapoor (2019) ^[8] reported reductions in leaf moisture content, crude protein, chlorophyll, and total sugars in mite-infested leaves. Feeding silkworms with such nutritionally inferior leaves results in poor larval growth, reduced cocoon weight, low shell ratio, and inferior silk quality (Krishnaswami, 1978; Dandin *et al.*, 2003) ^[5, 3].

The incidence and severity of mite infestation are strongly influenced by environmental factors. Govindan and Devaiah (1995) ^[4] reported that high temperature, low relative humidity, prolonged dry spells, and moisture stress favour rapid multiplication of mites. Excessive and indiscriminate use of chemical pesticides further aggravates the problem by destroying natural enemies, leading to mite resurgence (Central Silk Board, 2021) ^[1].

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Such conditions are frequently observed in several sericulture-dominated districts of Karnataka.

Karnataka, popularly known as the “*Silk State of India*”, contributes nearly one-third of the country’s mulberry silk production (Central Silk Board, 2022) ^[2]. Districts such as Mysuru, Ramanagara, Chamarajanagar, Kolar, and Tumakuru have extensive mulberry cultivation, making mite infestation a serious economic concern. Despite its importance, systematic information on the extent of mite infestation and associated crop losses in these districts is limited.

Therefore, the present study was undertaken to assess the mite infestation in mulberry and its impact on crop loss in selected districts of Karnataka, with the objective of generating location-specific information that can support effective integrated mite management strategies and sustainable sericulture development.

Materials and Methods

The study was conducted in selected sericulture-growing districts of Karnataka, namely Ramanagara, Bengaluru, Tumakuru, Kolar, Bidar, Maddur, and Chitradurga. Data on the percentage of mite infestation and crop loss in mulberry were collected through field observations and interactions with farmers. Infestation levels were assessed based on visible symptoms and severity on mulberry leaves, while crop loss was estimated based on reduction in leaf yield.

The collected data were compiled and analyzed using simple descriptive statistics to compare infestation levels and crop loss across districts.

Results and Discussion

The district-wise data on mite infestation and crop loss in mulberry are presented in Table 1.

Table 1: District-wise percentage of mite infestation and crop loss in mulberry

District	Percentage of infestation. (%)	Crop loss (%)
Ramanagara	10-15	5-10
Bangalore	10-15	5-10
Tumkur	15-20	>10
Kolar	25-30	10-15
Bidar	1-5	<5
Maddur	15-20	10-15
Chitradurga	5-10	5-10

The study revealed considerable variation in mite infestation across the selected districts of Karnataka. Kolar district recorded the highest infestation (25-30%) with corresponding crop loss of 10-15%, indicating severe mite damage. Tumakuru and Maddur districts also showed relatively high infestation levels (15-20%) with crop losses exceeding 10%. Moderate infestation and crop loss were observed in Ramanagara and Bengaluru districts, whereas Chitradurga exhibited lower infestation (5-10%) but moderate crop loss. Bidar district recorded the least infestation (1-5%) and minimal crop loss (<5%).

These findings indicate a positive correlation between mite infestation intensity and crop loss in mulberry. Higher infestation levels may be associated with favorable climatic conditions, moisture stress, and inadequate pest management practices, which facilitate rapid mite multiplication (Govindan & Devaiah, 1995; Sannappa, Doreswamy, & Muniyappa, 2001) ^[4, 7]. Similar trends have been reported in earlier studies highlighting mites as a major yield-limiting factor in mulberry cultivation (Sharath *et al.*, 2024; Ramesha *et al.*, 2025) ^[9, 10]. The results emphasize the need for targeted integrated mite

management strategies to minimize economic losses and ensure sustainable mulberry production.

Conclusion

The study concludes that mite infestation is a significant constraint in mulberry cultivation, causing substantial crop loss in several districts of Karnataka. Districts such as Kolar, Tumakuru, and Maddur were found to be more severely affected, while Bidar recorded minimal damage. Effective monitoring and adoption of integrated mite management practices, including cultural, biological, and chemical measures, are essential to reduce infestation levels and improve mulberry productivity. The findings of the study can aid policymakers and extension agencies in designing location-specific management strategies for sustainable sericulture development.

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