

## ICAR-NBAIR Makes Significant Progress in Management of Invasive South East Asian Thrips in Chilli

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South East Asian Thrips (*Thrips parvispinus* (Karny)) is a cosmopolitan invasive pest infesting chilli, eggplant, papaya, cucurbits, beans, pepper, potato, shallot and strawberry. This pest also infests ornamentals like Anthurium, Chrysanthemum, Dahlia, Dipladenia, Gardenia and Ficus. Besides India, this pest is now known to occur in Australia, France, Greece, Hawaii, Mauritius, Reunion, Spain, Tanzania and the Netherlands. It is a polyphagous pest and this particular species was first reported on papaya from Bengaluru in 2015 and further dispersal of this pest on vegetables or ornamentals was not reported. However, during 2021-2022 sudden outbreak of *T. parvispinus* was reported in chilli in Southern India especially Andhra Pradesh, Telangana and Karnataka. It has now spread further to Tamil Nadu, Madhya Pradesh, Chhattisgarh and Haryana infesting capsicum and chilli grown under greenhouse and open field.

*Thrips parvispinus* adults mainly colonize on chilli flowers and underside of leaves and larvae suck sap from under surface of leaves. Infestation causes heavy flower drop and leading to reduced fruit production. About 90 to 95 per cent of the flowers were found to be badly damaged and the average number of thrips recorded per flower was 18-20. In capsicum (*Capsicum annuum*), serious damage was recorded in Andhra Pradesh, Chhattisgarh, Telangana, Tamil Nadu and Karnataka and farmers were forced to abandon the crop since the pest species was found to congregate in large numbers on flowers causing severe flower drop leading to huge yield loss to the farmers.



Image 1: Adults *Thrips parvispinus* aggregation on chilli flower (left); Severe *T. parvispinus* infestation on terminal bud leads to inward curling of leaves (middle); Severely infested Capsicum fruit by *T. parvispinus* lost its market potential (right).

ICAR-NBAIR acts as a nodal agency for collection, characterization, documentation, conservation, exchange, research and utilization of agriculturally important insect resources and insect derived resources (entomopathogenic fungi, bacteria, virus and nematodes) for sustainable agriculture. On top priority ICAR-NBAIR scientists searched for effective entomopathogenic fungi and entomotoxic bacteria strains from ICAR-NBAIR microbial repository, for the management of different *Thrips* spp. infecting vegetables, fruits and ornamental crops.



Image 2: Untreated control (left), mortality and mycosis of *Thrips parvispinus* treated with bacterial and fungal biopesticides from ICAR-NBAIR.



Image 3: Biopesticides sprayed Chilli field at Chintamani, Karnataka

Fungal biopesticides like *Beauveria bassiana* and *Lecanicillium fusisporum*, and bacterial biopesticides like *Bacillus albus* and *Pseudomonas fluorescens* were selected as potential candidates to control *T. parvispinus* under field conditions as they can produce very high quantity of insecticidal enzymes like chitinase, protease, lipase and esterase. Formulations of these biopesticides were tested in field and gave impressive 60 – 80 per cent reduction of *T. parvispinus* population under field conditions in chilli crops when tested at different locations of Bengaluru, Cinthamani and Raichur areas of Karnataka.

Further with the help of All India Coordinated Research Projects on Biological Control on crop pests (AICRP-BC) centres, Regional Agricultural Research Station (RARS), Anakapalle, Andhra Pradesh and Professor Jayashankar Telangana State Agricultural University (PJTSAU), Hyderabad, Telangana evaluated ICAR-NBAIR fungal and bacterial biopesticides formulations for the management of *T. parvispinus* in chilli and recorded 70 to 80 per cent reduction in *T. parvispinus* population and thrips population decreased to less than 5 per flower from initial count of 20-25 thrips per flower after three sprays given at weekly intervals in chilli fields. The research findings were also corroborated by a team of scientists from ICAR-Krishi Vigyan Kendra (KVK), Karur district, Tamil Nadu in a field level demonstration conducted on chilli at farmer's fields. They recorded up to 70 per cent reduction of pest population. Presently, ICAR-NBAIR scientists in collaboration with scientists of AICRP-BC are involved in generation of bioefficacy data for promotion as technology for effective management of *T. parvispinus* in chilli.