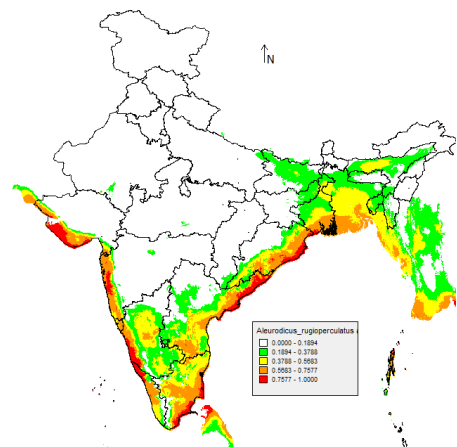


## ICAR-NBAIR Interventions in successful management of invasive whiteflies of coconut and oil palm

The coconut and the oil palm are cultivated throughout the tropics where it is interwoven with the lives of the people and also provide a variety of products. Pest problem is one of the major constraints for achieving higher production and productivity in these palms especially recent invasion of exotic invasive whiteflies. Since 2016, as many as six exotic whiteflies viz., rugose spiraling whitefly, *Aleurodicus rugioperculatus* during 2016, Bondar's nesting whitefly, *Paraleyrodes bondari* and nesting whitefly, *Paraleyrodes minei* during 2018 and palm infesting whitefly, *Aleurotrachelus atratus* invaded in these palm plants in India. Extensive spread along the coastal regions and gardens near the backwater of India is predicted owing to the favourable weather factors and availability of host plants.



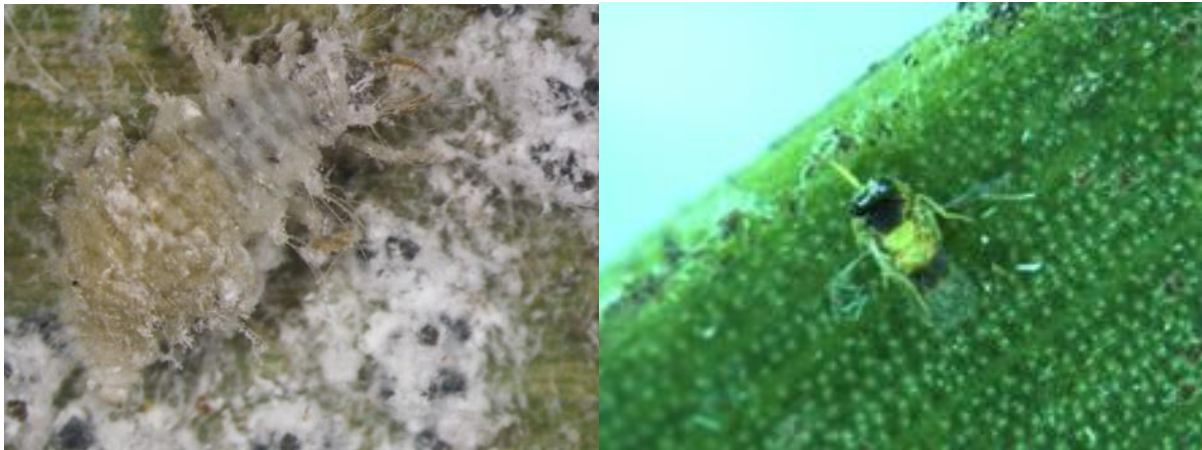
All these invasive species are highly polyphagous and have a host preference towards many economically important palm plants. Species of exotic whiteflies with similar habits co-exist in more or less the same niche and have a similar pattern of growth and development. The most insidious spread of these species in India is likely mediated by humans through movement of infested seedlings and plant materials. Nymphs and adults of these invasive whiteflies not only feed aggressively on leaf sap resulting in depletion of nutrients and water which leads to premature leaf drop and drying but also produce wax and excrete sticky honeydew which deposit on infested plants and inter-crops leading to the extreme growth of black sooty mould development which results in the reduction of



photosynthetic efficiency in palms and marketability of produce. It has now become a regular pest of coconut and oil palm in India, warranting control measures to avoid crop losses.

Soon after the report of these invasive species in India, ICAR-NBAIR took proactive measure to contain the damage through regular monitoring, exploration of biocontrol agents, development of mass production protocol, demonstrations, sensitizing the growers through awareness programme, conservation practices and development of bio-intensive management strategies. Natural enemies of insect pests play a key role in reducing the levels of pest populations below those causing economic injury to crop plants. Both natural and applied biological control tactics are important in successful management of pest populations. Unlike annual crops, plantation crops provide the more congenial conditions for parasitoids, predators and entomopathogens for their growth and perpetuation.

ICAR-NBAIR developed the augmentation, re-distribution, mass production and conservation strategies of the potential parasitoids, *Encarsia guadeloupae* and *E. cubensis* and predator, *Apertochrysa astur* in coconut and oil palm through habitat manipulation and also identified & validated a potential entomopathogenic fungus, *Isaria fumosorosea* (ICAR-NBAIR Pfu-5) -“**Shatpada Rugose Whitefly Kill**” against these invasive whiteflies, which



have been commercialized. Also standardization of mass production and formulation technology (talc, grain and oil based) for potential strains with higher bio-efficacy, field persistence and longer shelf life. Under field condition, 72-78% reduction in overall population of these whiteflies was observed in *I. fumosorosea* treated



palm with two sprays at 15 days interval. On other hand, natural parasitism of *E. guadeloupeae* on rugose spiraling whitefly to the extent of 65-82%, and 46-68% natural parasitism of *E. cubensis* on palm infesting whitefly to 46-68 % was observed.

Recently, a spray of oil based formulation of *I. fumosorosea* through agriculture drone was carried out in coconut plantations of Tumkur District, Karnataka, India. Economic analysis of the impact of these advisories resulted in Rs 9500/ha reduction in crop protection and a reduction of 900 ml of pesticides/ha. Besides bio-suppression of invasive whiteflies, this also conserves the natural enemies in coconut ecosystem and protecting environment.

With extensive extension efforts of the ICAR-NBAIR in motivating farmers and other stakeholders such as ICAR-KVKs, CIPMCs and line department officials on biological control of these invasive whiteflies resulted in spread of technology among various stake holders and adoption of biological control against whiteflies in coconut and oil palm gardens.



**Source: The Director, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru-560024**