Management of invasive whiteflies on coconut palms in Andaman Islands

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Occurrence of whiteflies have become widespread in the recent years in most coconut growing areas of the country. The first report of invasive spiralling whitefly (*Aleurodicusdispersus Russell*) on coconut was reported during 1996. Report of rugose spiralling whitefly (*Aleurodicusrugioperculatus Martin*) was reported from major coconut growing states of Tamil Nadu and Kerala during 2016 which presumably got introduced through ornamental palms from Florida, USA has subsequently expanded to all coconut growing regions in the country including North-East (Assam). The serious incidence has now reached the remote Islands of Andaman and Nicobar Islands, affecting the coconut populations in South Andaman. The pest could have reached the islands from mainland India mainly through transported vegetables, fruits and ornamental planting material. As the pest was first noticed in and around Haddo, South Andaman, the main entry could be through the ships from mainland that brought in vegetables and fruits.

The spiralling whitefly, a sucking pest feeds from under surface of coconut leaflets and produce remarkably high quantity of honey dew, over which black coloured sooty mould deposits are grown on upper surface of leaflets. As the incidence of this pest is mainly restricted on older leaves, the economic crop loss has been postulated to be meagre as the damage is manifested in terms of slight reduction in photosynthesis. It is mostly reported as mild to moderate category since 2016 and is considered as a non-lethal pest triggered by favourable weather factors and non-adoption of palm health management strategies. However, the damage is more severe in the case of dwarf cultivars.

In 2018 and early 2019, two species of invasive nesting whiteflies viz., *Paraleyrodesbondari Peracchi* and *Paraleyrodesmineilaccarino* and a new invasive

coconut whitefly, *Aleurotrechulusatratus* have been reported on coconut from Mandya, Karnataka. The identity and biology have been established by ICAR-CPCRI and ICAR-NBAIR. Hence, till now, five invasive whiteflies mostly from neo-tropical New World region have been reported in the country. Competitive regulation of exotic whiteflies one on another has also been observed that suppresses the aggressive invasive potential of the pest in many coconut growing tracts of the country.

In Andaman, during December 2020, on hearing about the possible incidence of rugose spiralling whiteflies, from coconut growers and home gardeners, the team of scientists from ICAR-CIARI has conducted a survey in Haddo, Marine Hill and Sipighat areas of South Andaman and found occurrence of different species of whitefly population, infesting coconut. The infestation was mainly recorded in coconut particularly dwarf palms and on ornamental palm (Areca lutescens) in the surveyed areas. The different species seen are rugose spiralling whitefly, *Aleurodicusrugioperculatus*, (about 2.2 mm with brown mottlings on wing), spiralling whitefly, *Aleurodicusdispersus* (2.0 mm with no mottlings on wings), nesting whitefly, *Paraleyrodesminei* (1.1 mm triangular with no mottlings, adult resides on bird nest like colony, several of these colonies were seen infected by entomopathegenic fungus (*Aschersoniasp*.). The infested palms and all surrounding plants are heavily seen covered with sooty mould fungi, affecting the photosynthetic ability of the plants. The residents were complaining more about sooty mould rather than the whiteflies as the walls nearby, cars parked underneath the trees and all the potted plants were covered with flakes of sooty mould.

Subsequent field visits in coconut plantations revealed the incidence of rugose spiralling whitefly in several parts of South Andaman mostly on Andaman Yellow and Andaman Orange Dwarf palms whereas Andaman Ordinary Tall palms had lesser incidence. Moderate incidence was observed in Andaman Green Dwarf palms. Similar observations were noticed for nesting whitefly. In almost all the places surveyed, more than one species of whiteflies could be seen on the under surface of the palm leaflets in several colonies. At marine hill area, the colonies of rugose whiteflies and nesting whiteflies were also seen on surface of tender coconuts as well as leaf petioles besides the leaflets. At Chouldari, the nesting whiteflies were observed on crops viz., Noni, tapioca, banana, and ornamental plants viz, Hibiscus, Heliconia, crotons and palms. Among these, the occurrence of sooty mould was severe mainly in dwarf coconut palms. The nesting whiteflies were observed on the indigenous tree Andaman Padauk (*Pterocarpus dalbergioides*) also. While the colonies were seen on lower surface of leaves of all other host plants,the nesting whiteflies colonies were seen mostly on upper surface of Padauk.

Eco-friendly management practices are suggested to cope up with this pest as the Islands are free from use of chemical pesticides. The management strategies should start from seedling production stage. The immature stages and adult whiteflies in coconut seedlings in nursery need to be destructed before it is taken for distribution or sales. Domestic quarantine protocols to be observed and movement of whitefly infested coconut seedlings and other ornamental plants should be avoided. Installation of yellow sticky trap along borders of coconut nursery may help in entrapping the sooty mould deposit which would facilitate good growth of seedlings. Water spray by jet propulsion mode wherever feasible will help in dislodging whitefly colonies. As

Different species of whiteflies on alternate host plants in coconut environment of Andaman Islands

competition among the different species of whiteflies is reported to bring down the overall population, no pesticide approach must be followed which will help in conserving abundant natural enemies and bio-scavengers in the system. In severe cases, neem oil @0.5% spray on lower surface of palm leaflets can be followed to lower the pest population. Installation of yellow sticky traps on palm trunks and along field borders will greatly help. Besides, the palms should be maintained at good health with application of nutrients, organic recycling of residual biomass & irrigation wherever possible. Destruction of heavily infested older leaves would also help in bringing down the pest population.

Coconut, being a perennial crop with yield loss realized only after three years of pest infestation, a systematic methodology of yield loss assessment by rugose spiralling whitefly which is non-lethal and seasonal has not been evolved so far by the scientists.

As the susceptible cultivars such as Andaman Yellow Dwarf and Andaman Orange Dwarf palms are sporadically cultivated mostly in and around the households, the management would be easier. All species of these invasive whiteflies could be suppressed by this combined approach in these islands. However, the yield of palms is expected to come down for at least one or two years in the absence of proper management practices. Generally, any yield loss up to 10% on a non-fatal pest infesting coconut is considered insignificant because the intervention cost would not be compensated for yield recoupment.

In other coconut growing areas in the country, the infestation of rugose spiralling whitefly is reportedly prevalent mostly for a period of about four to five months during the summer period. Then the pest is naturally subdued from the infested palms during monsoon period and by competitive regulation of rugose spiralling whitefly population through co-existence of nesting whiteflies. Similar situation can be expected in Andaman Islands too. Hence, conservation biological control is considered as the successful strategy in the bio-suppression of invasive coconut whiteflies in the Island region.

As the islands enter the high rainfall season coupled with high humidity in the coming months, the pest population may naturally get reduced as whiteflies in general are reported as susceptible to wetness. Meanwhile, the work on identification of any natural enemies of this pest in coconut plantations of Andaman and Nicobar Islands need focus. The spread of this pest to other remote islands could be checked by domestic quarantine restrictions. By creation of awareness among the Islander communities about the possible damage by the pest and the management strategies to be adopted, the pest damage could be easily mitigated. ■