

✓ Red ant technology for the management of tea mosquito bug in cashew

[R Maruthadurai, Scientist (Agricultural Entomology)]

Tea mosquito bugs (TMB), *Helopeltis* spp. (Hemiptera: Miridae), are very serious pest on cashew and causes damage to an extent of 30-40% yield loss. Red ant or Weaver ant, *Oecophylla smaragdina* (Fabricius) (Hymenoptera: Formicidae) is a potential biological control agent for TMB. An experiment was carried out to manage TMB in cashew through augmentative use of red ants. Predatory ant nest colonies (75 Number) were brought from distant tree and introduced in cashew trees. The results revealed that the damage score of 1 was recorded in trees colonized by red ants, whereas maximum damage score of 4 was recorded



in trees without red ants colonies. The TMB adult and nymph population was significantly lower in plants colonized by red ants.

Enhancement of milk yield, growth and amelioration of heat stress in buffalo, cattle and rabbit by managemental and nutritional intervention

[S K Das, Principal Scientist (Livestock Production Management)]

Experiments were carried to reduce heat stress to improve milk production in buffalo by managemental intervention through manual cooling of buffalo by splashing of water twice daily and by nutritional intervention i.e. supplementation of bypass fat @ 20 g/lit of milk to the feed. Results revealed that heat stress was overcome by 27% and milk yield was increased substantially. Effort was made to reduce heat stress on cattle by supplementation of bypass fat @

20 g/calf to the feed. Results indicated that heat stress was overcome by 34% and growth was enhanced by fortification of feed with the bypass fat. In rabbits, effort was made to reduce heat stress on rabbit by use of phytochemical i.e. "Stressrock" marketed by Ayurvet in water @ 1%, consecutive four days once in a month. Results revealed that reduction of growth was overcome around 35 % by adding of phytochemical in drinking water regularly particularly during summer.

Exploration of freshwater fish diversity in Goa

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To catalogue the freshwater fish diversity in the Western Ghats, NBFGR Kochi Unit in collaboration with ICAR Research Complex for Goa conducted intensive appraisal of fish diversity in freshwater habitats in Goa. Nine sampling locations covering the two major river systems in Goa, Mandovi and Zuari, were sampled

intensively using cast net, drag net, trap and scoop net. The sampling yielded a total number 55 fish species and 13 crustacean. This is one the first intensive efforts to catalogue the freshwater fish diversity in Goa. The major species obtained during the survey were *Pethia setnai*, *Haludaria pradhani*, *Rasbora dandia*, *Aspidoparia morar*, *Devario malabaricus*, *D. aequipinnatus*, *Garra mullaya*, *Aplocheilus lineatus*, *Dawkinsia filamentosa*, *Mystus malabaricus*, *Schistura altipedunculatus*, *Carinotetraodon travancoricus*, *Channa gachua*, *Puntius mahecola*, *Puntius vittatus*, *Systemus sarana subnasutus*, *X. cancila*, *Aplocheilus kirchmayeri* and *Pseudosphromenus cupanus*. Crustaceans observed during the survey were *Macrobrachium canarae*, *M. malcolmsonii*, *M. cf. gracilirostre*, *Caridina cf. babaulti*, *C. cf. gracilirostris*, *C. cf. hodgarti* and *Parathelphusa* sp.

✓ ES 24: Red ant (*Oecophylla smaragdina*) for Managing Tea Mosquito Bugs in Cashew Plants

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Cashew (*Anacardium occidentale* L.) is a very important foreign exchange earning crop of India. It was introduced into India from Brazil by Portuguese travellers during the 16th century mainly for checking soil erosion and afforestation on the coast. In India, cashew is cultivated mainly in Maharashtra, Goa, Karnataka, and Kerala along the west coast and Tamil Nadu, Pondicherry, Andhra Pradesh, Orissa, and West Bengal along the east coast. It is a major plantation crop in Goa and is cultivated on 55,000 ha with annual production of 23138 tonnes. Pest infestation is one of the major constraints in cashew production and productivity. Several insect pests viz., stem and root borer, tea mosquito bug, apple and nut borer, thrips, leaf miner, leaf and blossom webber, and mealy bug have been recorded on cashew ecosystem. Among these, tea mosquito bug [*Helopeltis* spp. (Hemiptera: Miridae)] is a very serious pest and causes damage to an extent of 30-40% yield loss. Four species of tea mosquito bug (TMB) *Helopeltis* (*H. antonii* S., *H. theivora* W. and *H. bradyi* W.) and *Pachepeltis maesareum* have been recorded in Goa. Both nymphs and adults suck the sap from tender shoots, inflorescences, immature nuts, and apples by making dark brown patches on green tender stem of young shoots and inflorescence rachis. Feeding on tender leaves causes their crinkling, curling, and drying. Affected shoots show long black lesions. The immature nuts infested by this pest develop characteristic eruptive spots and finally shrivel and fall off. Heavily infested trees show scorched appearance, leading to the death of shoots and growing tips. Severely affected branches may lead to the secondary infection by fungus causing die back disease. Management of tea mosquito bug mainly involves frequent spraying of broad spectrum insecticides, which causes environmental and other health hazards including pesticide residue in food commodities and development of insecticide resistance and pest resurgence. Now, the focus is shifted towards organic cultivation of cashew, which fetches premium price in the market. Ants are considered as the world's earliest record of biological control agent in China. The tree-inhabiting ants effectively protect tree crops as they actively patrol canopies and prey upon or deter a wide range of potential pests. Red ant or weaver ant [*Oecophylla smaragdina* (Fabricius) (Hymenoptera: Formicidae)] is a potential biological control agent on a wide range of insect pests in different crop plants. It has been successfully used as a biological control agent of insect pests in a number of fruit and cash crops such as cashew, mango, citrus, and cocoa. An experiment was carried out to manage tea mosquito bug in cashew through augmentative use of red ants. Seventy-five predatory ant nest colonies were

brought from distant trees and introduced in cashew trees during 2013. Initially, the ant nests were not established in cashew trees. Food material such as dried fish and sucrose were provided to help the colonies to establish themselves. Trees and branches were connected by small nylon thread for easy movement of predatory ants. Thirty per cent of the plants were colonized with red ants, from which five trees were selected at random for recording observations. Similarly, five trees without red ants were also selected at random for observation. Damage incidence was observed during November - February coinciding with flushing, flowering, and fruiting phases of the crop. Damage was assessed based on the number of feeding lesions and a score based on 0-4 scale was assigned, following standard procedure. The results revealed that the damage score of 1 was recorded in trees colonised by red ants whereas maximum damage score of 4 was recorded in trees without red ants. Tea mosquito bug adult and nymph population was significantly lower in plants colonised by red ants. More number of productive shoots was observed in trees patrolled by predatory ants whereas less number of productive shoots was noticed in trees without predatory ants. Other polyphagous predators viz., spiders, reduviids, preying mantids, and coccinellids populations were significantly higher in ant colonised trees whereas no predatory population were observed in insecticide sprayed trees. From the experiment, it is concluded that red ant, *Oecophylla smaragdina*, could be used as a potential biological control agent for managing tea mosquito bugs in cashew.
