

Biological, Biochemical and Physiological Attributes in Relation to Pest Management in Organically Grown Tea: Case Studies with Nematode and Shot Hole Borer Incidences

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In spite of the agro chemical usage in conventional tea estates, control of pests, diseases and weeds is often unsatisfactory as the system seems to stimulate the occurrence of damaging organisms more than it limits them. On the other hand, the organic systems claim to possess less or insignificant crop losses due to such occurrences, the scientific validations to which have not been fully perfected yet.

The incidence of important tea pests under organic and conventional tea growing systems were closely monitored in the long-term experiment of organic and conventional comparison (TRI-ORCON) trial set up at the Tea Research Institute, Talawakele. This paper discusses the lowered incidence of nematodes and Shot-hole borer (SHB) and development of pest resistance in organic system while sustaining comparable crop yields to conventionally grown tea.

Comparatively low damage caused by parasitic nematodes i.e. *Pratylenchus loosi* under organic management was attributed to increased polyphenol contents and altered anatomical changes which hindered nematode infestation in roots. Organic practices also favored C:N and E4:E6 ratios which lead to stimulate bio control efficacy through activation of naturally occurring bio control agents in soil; improved soil chemical and physical parameters contributed in fast recovery and compensation from root damages.

Lowered SHB infestation under organic system was correlated to lower sugar contents in the xylem sap resulted in poor *Ambrosia* fungal growth. Enhanced levels of various volatile compounds lead to borer deterrence in stems.

The environment manipulated through organic agricultural practices facilitated enumeration of natural enemies as well as bush vigor to withstand the external stress caused by the pest; the success also depends on the type of manure used.

Pest management under organic systems primarily relies on avoidance and prevention than curative measures. The degree of management, advanced planning and commitment etc. are therefore vital to assure a successful and sustainable pest management program. The extra time and effort will be offset against cost savings in chemical pesticides. Therefore, exploitation of important ecological agricultural concepts such as minimal use of agro-chemicals, use of organic amendments, cover crops etc. are suggested in order to ascertain a sustainable pest management in conventional tea cultivation.