

12. Abstract:

In order to study the influence of habitat diversification on insect pest incidence and their seasonality an agroforestry system in an extent of 2 ha is established at FRC, Hyderabad campus during the year 2003-04. Five tree components namely; *Annona squamosa*, *Azadirachta indica*, *Dendrocalamus strictus*, *Emblica officinalis*, and *Eucalyptus* sp. were raised in combination with Cotton, *Gossypium herbaceum* as intercrop under completely rain fed conditions. One control treatment cotton as a sole crop is maintained. Experiment was replicated thrice. Data was recorded from 2005-08 for three consecutive rainy seasons at monthly intervals in intercrop as well as tree components. In Cotton though a large number of insect pests were observed sucking pests viz., Cotton aphid, *Aphis gossypii* G, thrips, *Scirtothrips dorsalis* Hood and Cotton Jassid, *Amrasca biguttula biguttula* Ishida were predominant and were limiting factors in cotton production system during the period of study. Whereas boll worm complex was not significant except for spotted boll worm, *Earias vitella* F. and Leaf roller, *Sylepta derogata* F. during the year 2007-08. As a consequence of heavy aphid populations coccinellid were dominant amongst the predatory complex. Similarly significant spider fauna was observed. Therefore population dynamics of *A. gossypii*, *S. dorsalis*, and *A. biguttula biguttula* in case of insect pests and Coccinellid *Cheilomenes sexmaculatus* and spider fauna were studied in detail.

Population of *A. gossypii* was found throughout the crop growth stage of cotton in high densities. Though population density of *A. gossypii* though not influenced significantly under different agroforestry combinations in Neem + cotton, custard apple + cotton and aonla + cotton relatively lower population density was recorded. In case of thrips generally in cotton as a sole crop was infestation was more as compared to that in cotton as intercrop. Bamboo + cotton

and custard apple + cotton systems were particularly effective in their influence on thrips incidence. Cotton Jassid population in cotton as sole crop though not significantly was consistently higher as compared to that under agroforestry combination. Bamboo + cotton system was strikingly recorded for consistently lower Jassid population density. With respect to *C. sexmaculatus* Aonla + cotton system was recorded for significantly higher populations consistently across the observation periods. Spider population was higher in cotton as intercrop. In Neem + cotton and Custard apple + cotton systems spider population was more as compared cotton as sole crop. In case of spotted boll worm in year 2007-08 in Bamboo + cotton system percentage infestation was lowest, but percentage bolls infested per plant were the highest. Cotton leaf roller, *S. derogate* infestation in terms of percentage plants infested was significantly higher in bamboo + cotton system and lowest in Eucalyptus + cotton system.

Dying back of shoot tops was found to be a regular and serious problem in Neem. This is assuming serious proportions limiting growth of Neem in this region and needs further investigations. In Aonla insect pest incidence and their natural enemies is heavy and for commercial cultivation of aonla warrants deliberate manage strategies. Aonla aphid, *Cerciaphis emblica*, shoot gall insect, *Betuosa stylophora*, Bark eating caterpillar, *Indarbela* sp. and spherical mealy bug, *Nipaecoccus viridis* were identified as major insect pests in aonla. Aonla shelters significant populations of *Cheilomenes sexmaculatus* a major predator on aphids. Bamboo leaf folder, *Algedes coclesalis* is becoming a regular pest and assuming major status gradually across the time period. *Eucalytus* sp. During 2006-07 and 2007-08 throughout the year was found infested by gall wasp, *Leptocybe invasa* (Eulophidae, Hymenoptera). In general insect pest incidence in

custard apple, *Annona squamosa* (Tab. 8) is low. However, it was particularly found as favoured hosts for exotic mealy bug, *Phenacoccus solenopsis*.

13. Utility of the Research Findings:

Research findings are important in the context of ill effects of monoculture and