Internat. J. agric. Sci. Vol.2 No.2 July 2006 : (351-353)

Influence of age and stage of the host plant on insect pests of mango (*Mangifera indica* L.)

M. Kannan[1]* and N. Venugopala Rao
Department of Entomology, A.N.G.R.A.U., S.V. Agricultural College, TIRUPATI (A.P.) INDIA

ABSTRACT
Andhra Pradesh is one of the major mango growing states, where 2.8 lakh hectares (i.e.), and 40 per cent fruit crop area is occupied by mango. The situation of varied insect pests under different ecosystems was seen in the mango orchard of S.V. Agricultural College, Tirupati. A field study was initiated to document the incidence of various insect pests in relation to different age groups of mango plants in common variety Neelum. The results of the present study revealed that young (0-5 years old) plants were significantly preferred by all new flush damagers, *viz*., flea weevil, *Rhynchaenus mangiferae* Marshall, leaf twisting weevil, *Apodercus transquebaricus* Fabricius, leaf cutting weevil, *Deporaus marginatus* Pascoe, ash weevil, *Myllocerus discolour* Boheman, leaf miner, *Acrocercops syngramma* Mayrick, shoot borer, *Penicillaria jocostarix* Gune, leaf eating caterpillar, *Orgyia postica* Walker, *Euthalia garuda garuda* Moore, *Porthesia scientillans* Walker, *Lymantria marginata* Walker, *Latoia lepida* Cram. While middle age (5-15 years old) plants were preferred by aphid, *Toxoptera odinae* Vandergoot, flower webbers, flower feeding looper, *Thalassodes quadraria* Guen. Pests *viz*., leaf gall insects, *Procontarinia matteiana* Kieffer, *Amradiplosis ecinogalliperda* Mani and leaf webber, *Orthaga exvinacea* Hampson, leaf hopper, *Amritodus. atkinsoni* Lethier, *Idioscopus niveosparsus* Lethier, thrips, *Thrips hawaiiensis,* mealy bug, *Drosicha mangiferae* Green, nut weevil, *Sternochaetus mangiferae* Fabricius, fruit fly, *Bactrocera dorsalis* Hendel, fruit borer, *Conogethes punctiferalis* Guen, stem borer, *Batocera rufomaculata* DeGeer were more predominant on the old age trees (>15 years) than young age trees (0-5 years).

Key words : Influence, Age, Stage host plant, Pests, Mango.

INTRODUCTION

Mangifera indica L., is an important orchard crop in Andhra Pradesh. Nearly 260 insects and mites are recorded as pests of mango (Penna and Mohyuddin, 1997). These pests affect the crop in different stages which reduces the growth and development of plant as well as the yield. The age and stage of the crop was found to be playing a major role in the density of the pest population. Many insects like defoliators, borers and leaf miners damage young trees (before fruit bearing stage) and affect the vegetative growth of the plant. Whereas the trees that enter into the full bearing stage (6-15 years) get exposure to the pests both at vegetative stage as well as reproductive stages (flower and fruit damagers). There is no locations specific information on pest prevalence influenced by age and stage of the mango plant, the present investigation was planned to find the influence of age and stage of the host plant (mango) on insect pests of mango.

MATERIALS AND METHODS

The growth phases of the mango plant were basically divided as vegetative and reproductive phases. Again each growth phase was divided into three distinct crop stages. The vegetative phase was apportioned as new flush (July - August), twig expansion and matured leaf stage (Sept. - Oct.); while reproductive phase was divided into bud break stage (Nov. - Dec.), flowering and fruit setting stage (Jan. - Feb.) and finally fruit maturity (March - April), and ripening stage (May - June).

Similarly plants/trees (variety, Neelum) of three distinct age groups *viz*., 0-5, 5-15, >15 years were selected for the study. Under each treatment (age group) seven trees were selected for constant observation at weekly intervals. Populations were collected by fixing seven plants in each age group in the middle of the October. Data on the level of pest were documented through fixed plot survey. From each selected plant, four main branches (i.e.) one from each direction were selected. Again within each selective branch, three twigs were located and fixed with tag for observations. The documented information on pests of varied nature in terms of number per sample was categorised as insect pests of different stages, *viz*., new flush, twig expansion, matured leaf, flowering, and fruit maturity stages.

Data obtained were analysed statistically. The cumulative effect observed through various counts was subjected to analysis. The mean values were compared with CD values to derive required information.

RESULTS AND DISCUSSION

The present investigations clearly revealed (Table 1) that the young mango trees (0-5 years old) were more susceptible to shoot borer *Penicillaria jacosatrix*, flea weevil *Rhynchaenus mangiferae*, leaf twisting weevil *Apoderus transquebaricus*, leaf cutting weevil *Deoporaus marginatus*, Ash weevil, *Myllocerus discolor*, leaf miner, *Acrocercops syngramma*, leaf eating caterpillars *viz., Orgyia postica, Euthalia garuda garuda* termite, *Odentotermes obesus*, *Porthesia scientillans* and slug caterpillar *Latoia lepida* than old age trees (> 15 years old). These pests were seen to be high in synchrony with that of the vegetative stage (New flush stage) of the crop. Bhole *et al.* (1987) reported that the above vegetative pests were more active on new flush on nursery plants (0-5 years old). The variation in preference due to age group may be because of difference in morphological as well as biochemical characters of the plant.

During twig expansion stage, red ant, *Oecophylla smaragdina* and in matured leaf stage gall insects *Amradiplosis echinogalliperda*, *Procontarinia matteiana* and leaf webber *Orthaga exvinacea* were more predominantly seen on young trees (0-5 years) than on old aged trees (> 15 years); while the middle aged trees were found susceptible to the aphids *Toxoptera odinae* and flower caterpillar *Euproctis fraterna* at bud breaking stage (Table 2). The observations also revealed that the flowering and fruit maturity stage pests (Table 3) *viz.,* Hoppers *Amritodus atkinsoni* and *Idioscopus* spp. Thrips *Thrips hawaiensis*, flower webber, (unidentified), flower feeding looper, *Thalassodes quadraria*, mealy bug, *Drosicha mangiferae*, nut weevil, *Sternochaetus mangiferae*, fruitfly, *Bactrocera dorsalis* were causing more infestation to old aged trees (> 15 trees) than young (0-5 years) and middle aged (5-15 years) trees. Shaw *et al.* (1997) reported that matured and grown up trees (30 years and above) were more susceptible to leaf webber than young trees (below 10 years). Verghese (2000) reported that fruit setting induced the breakdown of diapause of stone weevil adult beyond February. Sood *et al.* (1971) confirmed that the hopper preferred old trees than young trees and the incidence of hopper increased with increase in age of trees.

[1]Department of Entomology, Tamil Nadu Agricultural University, Coimbatore- 641 003. Tamil Nadu, India
***Author for correspondence**

Table 1 : Influence of age of mango trees on insect pests (new flush stage)*

Sl.No	Age groups of mango trees	Flea weevil % of leaves rolled with holes / 12 twigs	Leaf twister weevil % of twisted leaves / 12 twigs	Leaf cutting weevil % of leaevs with cut / 12 twigs	Ash weevil % of norched leaves / 12 twigs	Leaf eating caterpillar *Orgyia postica* No. of larva / twigs	Leaf eating caterpillar *Euthalia garuda garuda* No. of larva / 12 twigs	Leaf eating caterpillar *Porthesia scientillans* No. of larva / 12 twigs	Slug caterpillar No. of larva / 12 twigs	Leaf miner % of mined leaves / 12 twigs
		1	2	3	4	5	6	7	8	9
1.	0-5 Years old	22.31[c] (28.09)	5.40[c] (12.87)	6.03[c] (14.20)	15.63[c] (23.19)	9.60[b] (3.10)	0.74[c] (0.853)	4.83[b] (2.19)	14.82[b] (3.85)	12.11[c] (20.36)
2.	5-15 Years old	21.22[b] (24.22)	5.06[b] (12.7)	5.31[b] (13.36)	14.94[b] (22.72)	9.11[b] (3.01)	0.66[b] (0.804)	4.39[b] (2.09)	13.29[a] (3.64)	11.40[b] (19.71)
3.	15 and above years old	19.8[a] (26.4)	4.11[a] (11.68)	4.43[a] (12.10)	13.67[a] (21.66)	8.38[a] (2.89)	0.557[a] (0.739)	3.65[a] (1.9)	12.1[a] (3.48)	10.52[a] (18.91)
	CD values at 5% level	0.40	0.89	0.64	0.69	0.09	0.02	0.1	0.46	0.36

* Figures in parenthesis (1, 2, 3, 4, and 9) are angular transformed values
* Figures in parenthesis (5, 6, 7, and 8) are square root transformed values
* Mean with same superscripts does not differ significantly. * Means of seven trees

Table 2 : Influence of age of mango trees on insect pests* (Twig expansion and Matured Leaf stages) *

S. No.	Age group of mango trees	Twig expansion stage			Matured leaf stage		Leaf webber No. of webs / tree
		Shoot borer % of bored shoot / 12 twigs	Red ant No. of nest / tree	Termite % of damage / tree	Gall farming insect I, % of galled leaves / 12 twigs *Amradiplosis Echinogalliperda*	Gall farming insect II, % of galled insect / 12 twigs *Procontarinia Matteiana*	
		(1)	(2)	(3)	(4)	(5)	(6)
1.	0-5 years old	20.53[c] (26.94)	4.2[a] (2.06)	12.08[c] (20.34)	20.34[a] (26.79)	14.39[a] (22.14)	7.87[a] (2.79)
2.	5-15 years old	16.37 (23.87)[b]	5.43[b] (2.32)	11.16[b] (19.5)	23.85[b] (29.22)	16.11[b] (24.22)	8.50[b] (2.91)
3.	15 and above years old	10.17[a] (23.87)	6.71[c] (2.59)	9.71[a] (18.14)	21.66[c] (27.74)	18.03[c] (25.11)	9.09[c] (3.01)
	CD value at 5% level	1.96	0.12	0.57	0.62	1.34	0.038

* Figures in parenthesis (1, 3, 4, and 5) are angular transformed values
* Figures in parenthesis (2 and 6) are square root transformed values
* Mean with same superscripts does not differ significantly. * Mean of seven trees

Table 3 : Influence of age of mango trees on insect pests (Flowering and Fruit Maturity Stages)*

S. No.	Age groups of mango trees	Bud breaking stage Aphids No. of aphids / 12 panicles	Flowering stage				Fruit maturity			
			Hoppers No. of hoppers / 12 panicles	Thrips No. of thrips / 12 panicles	Flower webbers No. of larva / 12 panicles	Flower feeding caterpillar (*E.F*) No. of larva / 12 panicles	Flower feeding looper No. of larva / 12 panicles	Mealy bug no. of fruit with mealy bug / 20 fruits	Nut weevil No. of damaged fruit / 20 fruits	Fruit fly No. of damaged fruit / 20 fruit
1.	0-5 years old	183.9[a] (13.56)	6.15[a] (7.84)	132.8[a] (11.52)	20.6[a] (4.54)	10.77[a] (3.28)	4.40[a] (2.083)	2.01[a] (1.40)	5.39[a] (2.397)	3.50[a] (1.87)
2.	5-15 years old	186.7[c] (13.66)	63.8[b] (7.99)	133.9[b] (11.57)	21.65[b] (4.63)	12.67[c] (3.56)	5.15[b] (2.59)	2.49[b] (1.56)	6.34[b] (2.511)	4.10[b] (2.02)
3.	15 and above years	185.6[b] (11.63)	66.0[c] (8.12)	135.3[c] (11.63)	22.63[c] (4.75)	11.62[b] (3.41)	5.6[c] (2.367)	2.78[c] (1.65)	6.87[c] (2.616)	4.53[c] (2.12)
	CD value at 5% level	0.03	0.09	0.03	0.07	0.11	0.05	0.1	0.04	0.08

* Figures in parenthesis are angular transformed values
* Mean with same superscripts does not differ significantly * Means of seven trees

REFERENCES

Bhole, S.D., Jadva V.S, Dumbre R.B. and Dalvi C.S., (1987). Seasonal incidence and chemical control of mango nursery pests in Konkan region *Journal Maharashtra Agricultural Universities,* **12(3):** 387-388

Penna, J.E. and Mohyuddin A.I., (1997) Insect Pests in Mango Botany Production and Use, Richard, Litz, Z. (ed.). CAB International Willing Food Oxon, UK. pp.327-340.

Shaw, S.S., Mukhrjee S.C, Choudhary S.K, Tripathy A.K, and Verma L.S., (1996). Screening of mango varieties against shoot webworm. *Orthaga exvinacea* Hamp (Pyralidae) *Journal of Applied Zoological Research*, **7:**45-56

Sood, N.K. and Rathore V.S., (1971). Correlation of population fluctuation of *Idiocerus clypealis* Leth. (Homoptera:Jassidane) with weather conditions. *The Indian Journal of Horticulture* **28(2):** 169-171.

Verghese, A., (2000). Status and management of stone weevil *Sternochaetus mangiferae* Fab. (Coleoptera:Curculionidae) in India Pest Management in Horticultural Ecosystems **6(1) :** 15-21.

Received : October, 2005; Accepted : February, 2006

ISSN : 0973-4791

THE ASIAN JOURNAL OF ANIMAL SCIENCE

AN INTERNATIONAL JOURNAL

HIND AGRI-HORTICULTURAL SOCIETY