

# Studies on the incidence of mango nut weevil, *Sternochaetus mangiferae* (Fabricius) in mango ecosystem

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## ABSTRACT

The incidence of mango nut weevil, *Sternochaetus mangiferae* (Fabricius) (MNW) commenced during the month of April and noticed till the month of July. Two varieties of mango viz., Neelum and Bangalora were observed for the incidence of MNW, the grub population was higher in Bangalora during the month of April and May and at the same time, as the season progresses during the month of June, the grub population was higher in Neelum. The pupae and adult stages of MNW were noticed during the month of July and during the second season (2016), the grub population in Neelum and Bangalora was found to be in significant during the initial observation. In case of offseason mango, the grub population in both the varieties varied from 0.08 to 0.61 grub per fruit and found to be insignificant in the presence of MNW.

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## INTRODUCTION

Mango, *Mangifera indica* L., is an important fruit crop of India. Its spread has gained momentum in recent years because of its export potential. It is the national fruit of India and Philippines and national tree of Bangladesh. India ranks first among world's mango producing countries accounting for about 50 per cent of the world's mango production. The mango growing states are North-eastern regions, Tamil Nadu, Andhra Pradesh, Orissa, Karnataka, Maharashtra, Kerala and Gujarat (Shukla and Tandon, 1985). India is also a prominent exporter of fresh mangoes to the world. The country has exported 55.41 thousand MT of fresh mangoes to

the world for the worth of Rs. 264.74 crores during the year 2012-13. It is being cultivated in about 80,000 ha in Tamil Nadu and the area under mango in Krishnagiri and Dharmapuri districts accounts for 37,862 ha of which, Krishnagiri district alone accounts for 31,000 ha with the annual production of 2.4 lakh tones. Krishnagiri district is the second largest mango pulp producer in the country after Chittor in Andhrapradesh and generates 400 to 500 crores of foreign exchange annually.

The mango nut weevil, *Sternochaetus mangiferae* (Fabricius) is a monophagous and one of the major pests of mango and found in almost all the major mango producing areas of the world. Shukla and Prasad (1981)

reported that 46.5 to 92.7 per cent fruits are damaged in different cultivars. The larvae cause direct damage by feeding on the endocarp and converting the seed inside it into black frass, the seed is useless for propagation and the infested fruits become unfit for processing and direct consumption owing to presence of excreta and emergence holes in the pulp. At present, in mango cultivation nut weevil is one of the major constraints in the export of fresh mango fruits. Hence, the present study was aimed at study on the incidence of mango nut weevil in mango in regular and off season mango cultivation during the fruiting season.

### MATERIAL AND METHODS

Studies on the seasonal incidence of mango nut weevil were carried out in D and E blocks of Mango orchard at Regional Research Station, Paiyur for a period of two years (March – July 2015 and 2016) in regular season mango production. In case of off season mango production the incidence was conducted for a period of one year (August – December 2016) in farmers’ field at Mahadevagollahalli village, Bargur block, Krishnagiri

district. During the investigation period, the mango trees was observed for the incidence of mango nut weevil for a period of five months in both regular and off season fruits. Two popularly grown varieties viz., Bangalora and Neelum suitable for both regular and off season mango production were taken in to account for the incidence of MNW. The fruits were collected from 15 trees from each variety and from each tree five fruits were taken and each tree served as a replication. Each tree was observed by fixing sampled spots (*i.e.*) five fruits were collected in such a way from each direction (four directions). Likewise the sampling was also done in fallen fruits present under the tree canopy and observed for the incidence. The fruits were examined for the incidence of MNW stages viz., grub, pupa and adult by destructive sampling. The data were then subjected to statistical analysis using Agres.

### RESULTS AND DISCUSSION

The MNW was found during the month of April till the month of July which coincides in both the varieties Neelum and Bangalora which coincided with marble sized

**Table 1 : Incidence of mango nut weevil, *S.mangiferae* in regular season mango**

Treatments	I season (2015)						II Season (2016)							
	March	April	May	June	July	July	March	April	May	June	July			
	Grub			Pupae	Pupae	Adult	Grub			Pupae	Pupae	Adult		
T <sub>1</sub> : Neelum (Tree)	0.0	0.54 (0.58) <sup>a</sup>	1.20 (0.99) <sup>a</sup>	2.33 (1.49) <sup>c</sup>	0.67 (0.67)	0.94 (0.88) <sup>b</sup>	0.54 (0.58) <sup>b</sup>	0.08 (0.16)	0.47 (0.52)	1.27 (1.08) <sup>a</sup>	2.40 (1.52) <sup>c</sup>	0.67 (0.67)	0.80 (0.76) <sup>a</sup>	0.87 (0.82) <sup>c</sup>
T <sub>2</sub> : Neelum (Ground)	0.0	0.74 (0.73) <sup>c</sup>	2.20 (1.42) <sup>c</sup>	2.93 (1.70) <sup>d</sup>	0.87 (1.00)	2.07 (1.42) <sup>c</sup>	1.73 (1.29) <sup>d</sup>	0.14 (0.22)	0.67 (0.70)	1.40 (1.09) <sup>b</sup>	2.73 (1.62) <sup>d</sup>	0.74 (0.73)	2.00 (1.38) <sup>d</sup>	1.73 (1.28) <sup>d</sup>
T <sub>3</sub> : Bangalora (Tree)	0.0	0.60 (0.55) <sup>b</sup>	1.40 (1.06) <sup>b</sup>	0.54 (0.58) <sup>a</sup>	0.61 (0.58)	0.87 (0.78) <sup>a</sup>	0.47 (0.52) <sup>a</sup>	0.01 (0.10)	0.54 (0.58)	2.20 (1.45) <sup>d</sup>	1.53 (1.14) <sup>a</sup>	0.60 (0.64)	0.87 (0.82) <sup>b</sup>	0.34 (0.46) <sup>a</sup>
T <sub>4</sub> : Bangalora (Ground)	0.0	1.27 (1.14) <sup>d</sup>	2.20 (1.46) <sup>c</sup>	1.40 (1.02) <sup>b</sup>	1.93 (1.32)	1.27 (1.01) <sup>d</sup>	0.80 (0.76) <sup>c</sup>	0.14 (0.22)	0.60 (0.61)	2.27 (1.44) <sup>c</sup>	1.93 (1.32) <sup>b</sup>	0.94 (0.84)	1.40 (1.06) <sup>c</sup>	0.54 (0.58) <sup>b</sup>
S.E.±	-	0.20	0.27	0.28	NS	0.26	0.23	NS	NS	0.33	0.33	NS	0.26	0.18
C.D. (P=0.05)		0.40	0.55	0.57		0.54	0.46			0.68	0.68		0.53	0.37

Values in parenthesis are square root transformed values, Means followed by the same letter are not significantly different, NS= Non-significant

**Table 2: Population dynamics of mango nut weevil in off season mango**

Treatments	August	September	October	November	December	
					Pupae	Adult
T <sub>1</sub> : Neelum (Tree)	0.08 (0.16)	0.21 (0.28)	0.41 (0.40)	0.27 (0.34)	0.14 (0.22)	0.08 (0.16)
T <sub>2</sub> : Neelum (Ground)	0.27 (0.34)	0.08 (0.16)	0.41 (0.40)	0.61 (0.54)	0.27 (0.40)	0.22 (0.28)
T <sub>3</sub> : Bangalora (Tree)	0.14 (0.22)	0.14 (0.22)	0.41 (0.43)	0.27 (0.40)	0.47 (0.46)	0.08 (0.16)
T <sub>4</sub> : Bangalora (Ground)	0.14 (0.22)	0.14 (0.22)	0.61 (0.58)	0.61 (0.54)	0.41 (0.37)	0.14 (0.22)
S.E.±				NS		
C.D. (P=0.05)						

Values in parenthesis are square root transformed values

NS= Non-significant

fruit to fruit ripening stages during the first season whereas the incidence was observed during the month of March itself during the second season. The incidence of MNW is higher in fallen fruits when compared to the fruits collected from the tree. The grub population ranged from 0.54 – 1.27 numbers per fruit during the month of April and it increased till June recorded 0.54 – 2.93 numbers per fruit. Among the two varieties tested throughout the observation period, the grub population was higher in Bangalora during the month of April and May recording 0.60 and 1.40 numbers per fruit, respectively. At the same time, as the season progresses during the month of June, the grub population was higher in Neelum variety recording 2.33 and 2.93 number per fruit in collected and fallen fruits, respectively. The pupae and adult stages of MNW were noticed during the month of July recording 2.07 numbers per fruit and 2.73 numbers per fruit in fallen fruits, respectively.

During the second season (2016), the grub population in Neelum and Bangalora was found to be insignificant during the month of March and April. During the month of May, the highest population was recorded in Bangalora and Neelum in fallen fruits recording 2.27 and 1.40 numbers per fruit, respectively. As the time progresses, the highest population of grubs was recorded during the month of June recording 2.73 and 2.40 numbers per fruit in collected and fallen fruits, respectively (Table 1). There was no significant difference in the pupal population during the month of June. An adult MNW was recorded during the month of July with its highest population recording in fallen Neelum fruits (1.73 numbers / fruit) followed by 1.40 numbers per fruit in the fruits collected from the Neelum.

The results on the incidence of MNW offseason mango in Neelum and Bangalora during 2016 revealed that, the grub population in both the varieties varied from 0.08 to 0.61 number per fruit (Table 2) and found to be

insignificant in the presence of MNW. The pupae and adult stages observed varied from 0.08 – 0.47 number per fruit and there was no significant difference in none of the stages of MNW and also in the varieties tested. This might be due to the very low population observed during offseason production in mango during the reporting period.

Kannan and Venugopal Rao (2007) reported that MNW was active from second week of March to last week of June during fruit maturity and ripening. The gradual increase in damage was observed from third week of April and peak weevil incidence was observed during the first week of May. The present study on the population dynamics in regular season cultivation of Mango indicated that MNW activity in terms of first emergence of adults commence during the month of march and April with its life stages passing through life stages of MNW viz., grub, pupa and adult the months of May, June and July. The results are also in concurrence with Shukla and Tandon (1985) who reported in Bangalore, SouthIndia, adults of the new generation emerge during June month.

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