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Management of mango weevil *Sternochetus* spp. (Coleoptera, Curculionidae) in Nagaland, India

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ABSTRACT: A field experiment was carried out in the farm of AICRP on Fruits,SAS:NU to evaluate the best treatments against mango weevil (*Sternochetus* spp.). The experiment was laid out in Randomized block designed using 7 different treatments. Among the different treatments, thiamethoxam (25% WG) gave the overall least mean number of incidence (1.17), with overall lowest mean per cent infestation (7.78). The treatment, thiamethoxam recorded highest overall yield (5.67 t ha^{-1}) with maximum CB ratio (1:10.60).

KEY WORDS: Nut weevil, incidence, infestation, yield, cost benefit ratio, thiamethoxam

Mango cultivation started more than 6000 years back and India accounts for nearly 80 per cent of the world's production and exports substantial quantities (Dhamo K. Butani, 2021).The production of mango, as per second advance estimate, during 2024-25 is expected to be 228.37 Lakh Metric Tons (LMT) in comparison to 223.98 LMT during 2023-24. (MoA & FW, 2025). Mango trees are vulnerable to attacks by numerous insect pests, with over 175 species (Nayar *et al*., 1976). Among the pests, 87 species feed on the fruit, 127 on the foliage, 36 on the inflorescences, 33 inhabit the buds, and 25 target the branches and trunk (Pena *et al*., 1998). Among the most serious pests is the mango weevil (*Sternochetus* spp.), particularly *S. mangiferae*. A major concern is that infestation by the mango weevil often goes unnoticed, as affected fruits may appear healthy externally while being internally damaged. Therefore, the present study was undertaken to evaluate and identify the most effective treatment for the management of mango weevil under local agro-climatic conditions.

The field trial was conducted on standing (3-4 years old) plants i.e.. Amrapali variety in the year 2024 and 2025. Randomized block design was followed, where 7 different treatments (Table 1) were applied to observe the effectiveness in management of mango weevil. The efficacy of different treatments was evaluated after the harvest, where 15 numbers of mango fruits were selected, cut open and examined for signs/symptoms of weevil infestation. The per cent infestation was calculated using the formula -

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Table 1. Effect of different treatments against of mango weevil (*Sternochetus* spp.) infestation during 2024 and 2025

Treatments	Mango weevil (*Sternochetus* spp.) infestation from 15 no. of fruits per plant						Yield (t/ha)			Pooled BC Ratio
	Mean (no.) 2024	Mean (no.) 2025	Pooled mean (no.)	Mean 2024 (%)	Mean 2025 (%)	Pooled mean (%)	2024	2025	Pooled	
T_1-Smoking the mango tree after fruit setting (Every 3 days after fruit set)	5.00	4.33	4.67	33.33	28.89	31.11	4.79	4.27	4.53	8.22
T_2-Spraying of Neem oil (5 ml/ litre of water after fruit set (second spray after 2-week etc)	4.67	3.33	4.00	31.11	22.22	26.67	4.66	4.67	4.67	8.79
T_3-Spraying of Neem oil +Smoking the mango tree after fruit setting (5 ml/ litre of water after fruit set (second spray after 2-week etc) + Every 3 days from after fruit set)	3.67	2.67	3.17	24.44	17.78	21.11	5.20	4.93	5.07	8.38
T_4-Proper sanitation and collection of fallen fruits (At weekly interval)	5.33	3.67	4.50	35.56	24.44	30.00	4.66	4.53	4.60	8.34
T_5-Raking the soil and spraying of *Beauveria bassiana* in soil and tree trunk (Once During flowering and once at marble size stage of fruit)	4.67	3.67	4.17	31.11	24.44	27.78	4.53	4.53	4.53	7.47
T_6-Standard Check: Thiamethoxam (0.5 gm/ litre of water at marble size)	1.67	0.67	1.17	11.11	4.44	7.78	5.60	5.73	5.67	10.60
T_7-Control	10.00	7.33	8.67	66.67	48.89	57.78	3.18	3.07	3.12	6.53
Sem±	0.69	0.41	0.40	4.59	2.72	2.64	0.40	0.16	0.22	-
CD at 5%	2.12	1.26	1.22	14.14	8.39	8.15	1.23	0.50	0.69	-

$$\% \text{ infestation} = \frac{\text{Number of infested mangoes}}{\text{Total number of mangoes}} \times 100$$

The cost economic of the different treatments was analysed using the prevailing market prices.

$$\text{Benefit Cost ratio} = \frac{\text{Net profit (Rs.)}}{\text{Total Cost (Rs.)}}$$

The pooled data of the years 2024 and 2025, (Table 1) reveals that the overall least mean 1.17 number of infestations was observed in T_6 i.e., Thiamethoxam 25 % WG followed by 3.17 mean number of infestation T_3 i.e.., treatment with Neem oil + smoking the mango trees after fruit setting. Highest overall pooled mean number infestation 8.67 was observed in T_7 *i.e*., Control. The lowest overall pooled per cent infestation was observed in T_6 i.e., Thiamethoxam 25 % WG followed by T_3 i.e.., treatment with Neem oil + smoking the mango trees after fruit setting with 7.78 and 21.11 respectively. The highest overall pooled mean percentage was observed in T_7 *i.e*., Control, followed by T_1 *i.e.* smoking of mango trees after fruit setting with 57.78 and 31.11 respectively. The highest overall yield was observed in T_6 i.e., Thiamethoxam 25 % WG with a yield of 5.67 (t/ ha.) and the lowest yield was observed in T_7 *i.e*. control, with a yield of 3.12 (t/ha.). The highest pooled cost benefit ratio was observed in T_6 *i.e*., Thiamethoxam 25 % WG with a CB ratio of 1:10.60 (Table 1)

Statistical analysis using the Critical Difference (CD) at 5% level confirmed that the differences between the control and each treatment were significant,

Sudeep *et al*. (2022) has reported similar kind of findings stating that thiamethoxam was the best treatment among the different treatments used. The insecticides of plant and animal origin were found to be comparatively less effective, leaving synthetic insecticides such as thiamethoxam as an effective option in case of severe infestation (Verghese *et al.,* 2003).

Cultural measures such as gathering and destroying the fallen fruits helps prevent adult weevils from emerging and attacking new fruit. Which provide an environmentally friendly option that minimizes reliance on pesticides, thereby reducing the chances of resistance development and chemical residues in fruits. The findings underscore the pest's potential to cause severe economic losses in mango production. However, the study also demonstrates that integrated management strategies- particularly the adoption of cultural practices, the use of biocontrol agents, and the application of insecticides such as Thiamethoxam- can effectively reduce weevil infestation. These combined measures offer a promising approach to safeguard mango yields and improve the livelihoods of the farming community.

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