Pest Management in Horticultural Ecosystems
Vol. 24, No.2 pp 87-90 (2018)

Efficacy of different insecticides against inflorescence thrips, *Scirtothrips dorsalis* Hood in mango

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ABSTRACT: Field experiments on effectiveness of different insecticides against inflorescence thrips, *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) in mango were carried out at Horticulture Farm, Junagadh Agricultural University, Junagadh, India during 2013-14 and 2014-15. All the treatments were significantly superior over untreated check. Results indicated that the maximum reduction of hopper population was recorded in the treatment of spinosad 45 SC (0.13%) and it was statistically at par with acetamiprid 20 SP (0.01%)and carbosulfan 25 EC (0.05%) after third and seventh day of first and second spray in both years. The highest population of thrips per inflorescence found in treatment flubendiamide 480 SC, 0.14% and chlorfenapyr 10 SC (0.0075%).

Keywords: Insecticides, mango, *Scirtothrips dorsalis,* thrips

INTRODUCTION

Mango (*Mangifera indica* Linn.) is the most important commercial fruit of India and is known as "King of fruits". Production and quality of mango are mainly hampered by the incidence of about 400 insect pests (Devi Thangam *et al.,* 2013). Out of these, *Scirtothrips dorsalis* Hood is one of the emerging pests in Gujarat and elsewhere (Kumar *et al.,* 1994, Patel *et al.,* 2013; Ananthakrishnan, 1993; Aliakbarpour and Rawi, 2012). Both nymph and adults of *S. dorsalis* suck the sap from the young leaves, tender shoots, inflorescences and fruits of the mango which results in leaf curl, stunted fruit growth, discoloration of buds and premature fruit drop. Many conventional insecticides have been recommended for the management of this pest, in the past on mango or other crops (Kumar *et al.,* 1994, Patel *et al.,* 2013, Tripathy *et al.,* 2013 and Panse *et al.,* 2012). However, indiscriminate use of chemical insecticides has created the pest resistance, besides the environmental pollution problems. At present the newer and safer molecules are available that offer lowest possible risk, with low dosages and high efficacy. Some of such new molecules are yet to be been tested and that would be an alternative of previous insecticides to control the inflorescence thrips. Hence present investigation on effectiveness of different insecticides against inflorescence thrips in mango was carried out.

MATERIALS AND METHODS

Field experiments were carried out at Horticulture Farm, Junagadh Agricultural University, Junagadh, Gujarat, Indiaduring 2013-14 and 2014-15to find out the effectiveness of different insecticides against inflorescence thrips of mango (cv. Kesar). Experiments were laid out in Completely Randomized Block Design with three replications and ten treatments. The spraying of insecticides was done at morning hours, at initiation of incidence of the pests. Second spray was applied at 15 days after first spray. Number of thrips was counted on each of five inflorescences selected randomly from four directions of each tree before, 3 and 7 days after application. The data obtained from the field experiments were subjected to square root transformation and subjected to ANOVA analysis.

RESULTS AND DISCUSSION

The results (Tables 1 & 2) indicated significant differences among all the treatments in both the years of study. It is noticeable from data in Table 1 that the before spray the thrips population was non significant showing even distribution. On third day of observation, all the treatments were significantly reduced the population of thrips over untreated control. The lowest population of thrips per inflorescence after three days of first spray was recorded in the treatment of spinosad 45 SC, 0.018% (3.26) and it was statistically at par with acetamiprid 20 SP, 0.01% (3.64) and carbosulfan 25 EC 0.05% (3.99). The next best treatments were thiomethoxam 25 WG 0.0084% imidacloprid 17.8 SL, 0.005% and difenthiuron 50 WP, 0.05% it showed 4.52, 5.76 and 5.78 hoppers per inflorescence, respectively. After seven days of first spray the spinosad 45 SC, 0.018% and acetamiprid 20

Table 1. Efficacy of different insecticides against thrips in mango (2013-14)

Treatment	Thrips per inflorescence					
	Before spray	After first spray		Before spray	After second spray	
		3DAS	7 DAS		3DAS	7 DAS
Thiamethoxam 25 WG @0.0084%(0.3 ml/L)	19.33 (4.40)	4.52 (2.13)	5.40 (2.32)	18.95 (4.35)	4.59 (2.14)	5.37 (2.32)
Spinosad 45 SC @ 0.018% (0.4 ml/L)	21.68 (4.66)	3.26 (1.81)	2.76 (1.66)	19.83 (4.45)	3.19 (1.79)	2.82 (1.68)
Buprofezin 25 EC @ 0.025% (1.0 ml/L)	28.34 (5.32)	7.01 (2.65)	7.04 (2.65)	24.17 (4.92)	7.13 (2.67)	6.97 (2.64)
Chlorfenapyr 10 SC, 0.0075% (0.8 ml/L)	25.00 (5.00)	8.20 (2.86)	7.90 (2.81)	25.87 (5.09)	8.37 (2.89)	7.95 (2.82)
Carbosulfan 25 EC @ 0.05% (2.0 ml/L)	18.23 (4.27)	3.99 (2.00)	4.03 (2.01)	18.55 (4.31)	4.05 (2.01)	4.08 (2.02)
Acetamiprid 20 SP @0.01% (0.5 ml/L)	22.66 (4.76)	3.64 (1.91)	3.10 (1.76)	21.68 (4.66)	3.70 (1.92)	3.23 (1.80)
Flubendiamide 480 SC, 0.014% (0.03 ml/L)	19.16 (4.38)	9.59 (3.10)	8.88 (2.98)	19.30 (4.39)	9.57 (3.09)	8.90 (2.98)
Difenthiuron 50 WP @0.05% (1.0 ml/L)	16.97 (4.12)	5.78 (2.40)	6.57 (2.56)	17.03 (4.13)	5.74 (2.40)	6.57 (2.56)
Imidacloprid 17.8 SL @ 0.005%(0.3 ml/L)	15.63 (3.95)	5.76 (2.39)	6.50 (2.55)	16.65 (4.08)	5.82 (2.41)	6.60 (2.57)
Control (untreated)	26.73 (5.17)	12.86 (3.59)	13.59 (3.69)	24.14(4.91)	13.74(3.71)	14.85(3.85)
S.Em.±	0.451	0.142	0.115	0.491	0.134	0.127
C.D. at 5 %	NS	0.419	0.340	NS	0.396	0.374
C.V. %	**16.95**	**9.92**	**7.99**	**18.76**	**9.27**	**8.71**

*Square root transformation used, Data in parentheses are transformed values
DAS= Day after spray

Table 2. Efficacy of different insecticides against thrips on mango (2014-15)

Treatment	Before spray	After first spray		Before spray	After second spray	
		3DAS	7 DAS		3DAS	7 DAS
Thiamethoxam 25 WG @0.0084%(0.3 ml/L)	16.86 (4.11)	9.49 (3.08)	9.32 (3.05)	16.86 (4.11)	10.74(3.28)	10.26 (3.20)
Spinosad 45 SC @ 0.018% (0.4 ml/L)	23.91 (4.89)	5.95 (2.44)	5.85 (2.45)	20.01 (4.47)	6.17 (2.48)	5.41 (2.33)
Buprofezin 25 EC @ 0.025% (1.0 ml/L)	26.66 (5.16)	15.24 (3.90)	15.05 (3.88)	20.55 (4.53)	14.26 (3.78)	14.93 (3.86)
Chlorfenapyr 10 SC, 0.0075% (0.8 ml/L)	25.98 (5.10)	18.92 (4.35)	18.23 (4.27)	28.69 (5.36)	12.96 (3.60)	13.69 (3.70)
Carbosulfan 25 EC @ 0.05% (2.0 ml/L)	18.86 (4.34)	7.67 (2.77)	8.01 (2.83)	23.52 (4.85)	8.07 (2.84)	9.53 (3.09)
Acetamiprid 20 SP @0.01% (0.5 ml/L)	22.98 (4.79)	6.83 (2.61)	7.01 (2.65)	18.63 (4.32)	7.86 (2.80)	7.18 (2.68)
Flubendiamide 480 SC, 0.014% (0.03 ml/L)	19.98 (4.47)	17.89 (4.23)	17.56 (4.19)	19.65 (4.43)	10.82 (3.29)	10.93 (3.31)
Difenthiuron 50 WP @0.05% (1.0 ml/L)	16.38 (4.05)	12.41 (3.52)	11.86 (3.44)	20.01 (4.47)	12.94 (3.60)	12.77 (3.57)
Imidacloprid 17.8 SL @ 0.005% (0.3 ml/L)	17.89 (4.23)	8.98 (3.00)	8.80 (2.97)	23.98 (4.90)	9.86 (3.14)	7.93 (2.82)
Control (untreated)	28.02 (5.29)	17.08 (4.13)	18.01 (4.24)	23.23 (4.82)	18.86 (4.34)	20.52 (4.53)
S.Em.±	0.454	0.145	0.135	0.525	0.154	0.134
C.D. at 5 %	NS	0.429	0.399	NS	0.454	0.395
C.V. %	**16.93**	**7.40**	**6.95**	**9.85**	**8.03**	**7.00**

*Square root transformation used, Data in parentheses are transformed values

SP, 0.01% showed lowest population of thrips followed by carbosulfan 25 EC, 0.05% and thiamethoxam 25 WG, 0.0084%. The treatments of flubendiamide 480 SC, 0.014% and chlorfenapyr 10 SC, 0.0075% were failure to reduce the thrips population. More or less similar trends were observed after three and seven days of second spray.

In the second year of study (Table 2), the mean population of thrips ranged from 16.86 to 26.66 per inflorescence was recorded before the spray. The lowest population of thrips per inflorescence were recorded in the treatment of spinosad 45 SC, 0.13% , acetamiprid 20 SP, 0.01% and carbosulfan 25 EC, 0.05% it showed 5.95 & 5.85, 6.83 & 7.01, 7.76& 8.01 thrips per inflorescence after three and seven days of first spray, respectively.The findings of present studies are in conformity with the results obtained by patil *et al.* (2009) who reported the treatment with Deltamethrin 1 EC + Triazophos 35 EC @ 0.072% significantly reduce the thrips population and it was statistically at par with the treatments of spinosad 45 SC @ 0.0135% and carbosulfan 25 EC 0.025%, at 4th, 7th and 14th days after spray. The results in respect of spinosad 45 SC and carbosulfan 25 EC against onion thrips are in agreement with these of Holloway and Forrester (1988) in cotton and Shitole *et al.* (2002). Singh *et al.* (2011) reported the lowest thrips population (17.0 nymph/ plant) were recorded with deltamethrin 2.8 EC (0.095%) and it was found to be at par with spinosad 45 SC (0.1%) at 7 days after last spray in onion crop. The reports of Panse *et al.,* (2012) and Tripathy *et al.,* (2013) partially support to present finding who found profenophos proved to be most effective treatment against thrips and at par with spinosad and neem oil.

From our studies, it can be concluded that the treatment of spinosad 45 SC, 0.018%, acetamiprid 20 SP (0.01%) and carbosulfan 25 EC (0.05%) were effective to manage thrips population in mango.

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MS Received 29 August 2018
MS Accepted 8 October 2018