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EFFECTIVENESS OF DIFFERENT INSECTICIDES AGAINST HOPPER, *AMRITODUS ATKINSONI* (LETHIERRY) IN MANGO

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ABSTRACT

Field experiments on effectiveness of different insecticides against hopper, *Amritodus atkinsoni* (Lethierry) in mango was carried out at Horticulture farm, Junagadh Agricultural University, Junagadh during 2014 and 2015. All the treatments were significantly superior over untreated check. Results of the experiment indicated that the maximum reduction of hopper population after third and seventh days were recorded in the treatment of spinosad 45 SC, 0.018% (3.50 and 2.43 hopper/ inflorescence), it was statistically at par with carbosulfan 25 EC 0.05% (3.96 and 2.92 hopper/ inflorescence) and imidacloprid 17.8 SL, 0.005% (4.09 and 2.99 hopper/ inflorescence) in first year. Indistinguishable trends were observed after three and seven days of second year. The treatments of flubendiamide 480 SC, 0.014% and chlorfenapyr 10 SC, 0.0075% were failure to check hopper population.

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). The crop is attacked by different pest at various growth stages of plant. Out of these the mango hopper *Amritodus atkinsoni* (Lethierry) is serious pests of mango at flowering and fruiting stages of the crop. *Amritodus atkinsoni* (Lethierry), *Idioscopus clypealis* (Lethierry) *I. niveosparsus* (Lethierry) and *I. nitidulus* (Walker) are serious pests of mango and cause yield loss up to 100% (Rahman and Kuldeep, 2007; Prabhakara *et al.*, 2011). Patil *et al.* (1988) from India stated that the loss ranged from 20 to 60 per cent with the incidence of hoppers. The hoppers are active during flowering period and in the remaining period, they remain confined to the under surface of leaves, situated in dark and moist areas of the tree. Large number of nymphs and adults of the hoppers puncture and suck the sap from tender shoots, inflorescence and leaves of mango crop, which cause non-setting of flowers and dropping of immature fruits, thereby reducing the yield. The present findings are in agreement with earlier studies by Gunddapa *et al.* (2014). The extensive and indiscriminate use of pesticides for hoppers in mango has led to several problems like resurgence of secondary pests, health hazards and pesticide residues on fruit. Hence there is a need to evaluate newer molecules. The objective of the present investigation was to test the efficacy of newer insecticide molecule having different mode of action for the management of hoppers in mango.

MATERIALS AND METHODS

With a view to find out the effectiveness of different insecticides against hopper in mango (cv. Kesar), the experiment was carried out at Horticulture farm, Junagadh Agricultural University, Junagadh in completely randomized design with three replications and ten treatments in two consecutive years *i.e.* 2014 & 2015. The spraying of insecticides was done at morning hours, at initiation of incidence of the pests. Second spray was applied at 15 days of first spray. The population of adults was recorded as per the method suggested by Girish kumar and Giraddi (2001) and Borad and Rathod (2013) from 5 randomly selected inflorescences of each tree, the data was recorded before one day as pre-treatment and post- treatment observations on survival population were recorded 3 and 7 days after spray application. The data obtained from the field experiments were subjected to square root transformation and subjected to ANOVA analysis.

RESULTS AND DISCUSSION

Mango hopper

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 hopper population was non significant showing even distribution. On third day of observation, all the treatments were significantly reduced the population of hopper over untreated control. The lowest population of hopper per inflorescence after three days of first spray was recorded in the treatment of spinosad 45 SC, 0.018% (3.50 hopper per inflorescence) and

Table 1: Efficacy of different insecticides against hoppers on mango (Year: 2014)

Treatments	Hopper per inflorescence					
	Before spray	After first spray		Before spray	After second spray	
		3DAS	7 DAS		3DAS	7 DAS
Thiamethoxam 25 WG, 0.0084%	5.27(27.77)	2.48(6.17)	2.43(5.90)	4.68(21.90)	2.50(6.27)	2.44(5.97)
Spinosad 45 SC, 0.018%	5.21(27.18)	1.87(3.50)	1.56(2.43)	4.61(21.25)	1.97(3.87)	1.60(2.56)
Buprofezin 25 EC, 0.025%	5.88(34.61)	2.79(7.80)	2.91(8.47)	5.88(34.61)	2.79(7.80)	2.92(8.55)
Chlorfenapyr 10 SC, 0.0075%	5.86(34.34)	2.86(8.20)	3.62(13.13)	5.82(33.87)	2.85(8.14)	3.64(13.25)
Carbosulfan 25 EC, 0.05%	5.93(35.20)	1.99(3.96)	1.71(2.92)	5.68(32.22)	2.04(4.16)	1.77(3.13)
Acetamiprid 20 SP, 0.01%	5.49(30.18)	2.34(5.46)	2.14(4.59)	4.01(16.05)	2.32(5.37)	2.24(5.00)
Flubendiamide 480 SC, 0.014%	5.68(32.26)	2.94(8.64)	3.74(13.99)	5.28(27.88)	2.93(8.60)	3.73(13.89)
Difenthiuron 50 WP, 0.05%	5.64(31.85)	2.69(7.24)	2.55(6.50)	5.56(30.88)	2.66(7.09)	2.58(6.64)
Imidacloprid 17.8 SL, 0.005%	5.67(32.15)	2.02(4.09)	1.73(2.99)	6.15(37.86)	2.01(4.03)	1.84(3.40)
Control (untreated)	5.90(34.77)	4.04(16.35)	4.11(16.92)	4.76(22.69)	4.15(17.25)	4.11(16.92)
S.Em. ±	0.268	0.151	0.116	0.506	0.134	0.112
C.D. at 5 %	NS	0.444	0.343	NS	0.396	0.330
C.V. %	8.21	10.03	7.60	16.71	8.87	7.22

*Square root transformation used, Data in parentheses are retransformed values; DAS = Day after spraying

Table 2: Efficacy of different insecticides against hoppers on mango (Year: 2015)

Treatments	Hopper per inflorescence					
	Before spray	After first spray		Before spray	After second spray	
		3DAS	7 DAS		3DAS	7 DAS
Thiamethoxam 25 WG, 0.0084%	5.32(28.30)	2.75(7.56)	2.76(7.64)	4.57(20.85)	2.74(7.51)	2.80(7.84)
Spinosad 45 SC, 0.018%	5.21(27.18)	2.00(4.00)	1.89(3.58)	4.83(23.33)	1.91(3.66)	1.87(3.50)
Buprofezin 25 EC, 0.025%	5.58(31.17)	3.10(9.63)	3.17(10.05)	5.87(34.46)	3.10(9.59)	3.10(9.59)
Chlorfenapyr 10 SC, 0.0075%	5.63(31.73)	3.44(11.81)	3.62(13.10)	5.57(30.99)	3.80(14.47)	3.94(15.50)
Carbosulfan 25 EC, 0.05%	6.05(36.56)	2.28(5.20)	2.02(4.07)	6.24(38.94)	2.04(4.16)	2.12(4.49)
Acetamiprid 20 SP, 0.01%	5.35(28.66)	2.48(6.17)	2.51(6.30)	4.08(16.62)	2.90(8.41)	2.66(7.08)
Flubendiamide 480 SC, 0.014%	6.25(39.06)	3.77(14.19)	3.76(14.11)	5.41(29.30)	3.91(15.29)	3.90(15.24)
Difenthiuron 50 WP, 0.05%	5.88(34.61)	2.65(7.04)	2.67(7.15)	5.60(31.40)	2.58(6.67)	2.89(8.35)
Imidacloprid 17.8 SL, 0.005%	5.89(34.73)	2.46(6.07)	2.27(5.17)	5.77(33.33)	2.23(4.99)	2.23(4.99)
Control (untreated)	5.63(31.66)	3.95(15.60)	3.90(15.24)	4.32(18.69)	4.13(17.08)	4.18(17.47)
S.Em. ±	0.366	0.193	0.150	0.385	0.111	0.167
C.D. at 5 %	NS	0.570	0.443	NS	0.326	0.494
C.V. %	11.16	11.58	9.09	9.50	6.53	9.77

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

it was statistically at par with carbosulfan 25 EC 0.05% (3.96 hopper per inflorescence) and imidacloprid 17.8 SL, 0.005% (4.09 hopper per inflorescence). The next best treatments were acetamiprid 20 SP, 0.01%, thiomethoxam 25 WG 0.0084% and difenthiuron 50 WP, 0.05% it showed 5.46, 6.17 and 7.24 hoppers per inflorescence, respectively. The highest population of hopper per inflorescence found in treatment flubendiamide 480 SC, 0.14%. 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 hopper ranged from 27.18 to 36.56 hoppers per inflorescence was recorded before the spray. The lowest population of hopper per inflorescence were recorded in the treatment of spinosad 45 SC, 0.018% , carbosulfan 25 EC 0.05% and Imidacloprid 17.8 SL, 0.005% it showed 4.00 & 3.52, 5.20 & 4.07, 6.07 & 5.17 hopper per inflorescence after three and seven days of first spray, respectively. The same trend was observed after 3 and 7 days of second spray. The findings of present studies are in conformity with the results obtained by Verghese (2000) who conducted two experiments one each on mango varieties, Alphanso and Bangampalli at Bangalore. Results of both experiments showed that imidacloprid (0.2 - 0.8 ml/litre) and lambda-cyhalothrin (0.5 ml/litre) were effective and comparable with the standard monocrotophos (1 ml/litre). Indumathi and Savithri (2003) reported that three sprayings of imidacloprid 0.005% resulted in the highest, whereas sprayings with malathion 0.05% resulted in the lowest reduction in the number of the mango hoppers. According to Sushil Kumar *et al.* (2005) reported that imidacloprid (0.005%), thiamethoxam (0.0084%), profenophos (0.1%) and lambda-cyhalothrin (0.003%) were effective in controlling hopper complex on alphanso mango in South Gujarat. Rathod and Borad (2009) at Anand in Gujarat reported that the trees treated with imidacloprid, thiamethoxam, acetamiprid and fipronil exhibited higher performance against hoppers, whereas the treatments of carbaryl, endosulfan and deltamethrin were mediocre in their effectiveness against mango hoppers. The spinosad is newer insecticidal molecules no research review available on specifically for control of mango hopper, however it was best insecticides for control of cotton aphid *Aphis gossypii* Glover and also safer for different stages of predatory coccinellids reported by Awasthi *et al.* (2013).

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