



Relative bio-efficacy of some newer molecules against shoot and fruit borer (*L. orbonalis*) of brinjal

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Abstract : Studies were carried out on bio-efficacy of insecticide against brinjal jassid (*Amrasca biguttula biguttula* Ishida) and whitefly (*Bemisia tabaci* Gennadius) at Regional Horticultural Research Station Farm, NAU, Navsari during 2011-12. Out of eight newer insecticides tested at different intervals, pooled data indicated that minimum jassid population (4.71 jassids/three leaves) was recorded in plots treated with imidacloprid and lower number of whiteflies were observed in plots treated with imidacloprid (8.08 whiteflies/three leaves).

Key Words : Brinjal, Bioefficacy, Newer molecule, Jassid, Whitefly

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Brinjal (*Solanum melongena* Linnaeus) is an important vegetable grown in all the seasons. It also known as eggplant is referred a “king of vegetables”, originated from India and now grown as a vegetable throughout the tropical, sub-tropical and warm temperate areas of the world. In India brinjal occupies an area of 680.0 thousand ha with a production of 118.96 lakh tones and productivity is 17.5 per cent. In Gujarat area of brinjal is 72.0 thousand ha with a production of 12.36 lakh tones and productivity is 17.2 per cent (Anonymous, 2011). *A. biguttula biguttula* causes damage right from an early seedling stage to the fruit setting stage, resulting in a loss of 50 per cent in yield (Bindra and Mahal, 1981). Among sucking pests jassid and whitefly are the major pests of brinjal. Jassids attacks the brinjal crop from the initial stage of crop growth. In case of severe infestation, typical “hopper burn” symptoms are seen on leaves (Gaikwad *et al.*, 1991). As per the report of Ratanpara *et al.* (1994) the jassid (*A. biguttula biguttula*) was regularly occurring insect pest of brinjal in Gujarat was found throughout the year. From Gujarat the brinjal crop was free from infestation of *B. tabaci* in July-August,

while the pest was active during colder months *i.e.* November to January.

The field experiment were carried out at Regional Horticultural Research Station Farm, NAU, Navsari during the year 2011-12 on brinjal variety ‘Surti Ravaiya’ in a Randomized Block Design with 8 treatments (Table 1) with 3 replications each. The observations of sucking pests particularly jassid and whitefly were recorded from three leaves (top, middle and bottom) of five randomly selected plants from net plot area. Such observations were recorded a day before the spray as well as 1, 3, 5 and 7 days after spray. The data thus obtained were converted to average population per three leaves and subjected to statistical analysis.

The results of relative efficacy of eight different insecticides against jassid, *A. biguttula biguttula* showed (Table 1) at 1st day after spraying lowest (7.54 jassids /three leaves), population of jassid was found in plots treated with imidacloprid which was at par with acetamiprid (8.41 jassids / three leaves) and deltamethrin (13.05 jassids /three leaves). However, control (water spray) recorded highest population

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of jassids (28.99 jassids/three leaves). The data recorded at 3rd day after spraying indicated that minimum (7.33 jassids / three leaves) counts were recorded in imidacloprid which was at par with acetamiprid and deltamethrin (8.07 and 11.96 jassids/three leaves, respectively). The higher number of jassids was found in control (water spray) (27.29 jassids/three leaves). More or less similar trend of treatment effect was noticed even at 5th day after spraying. The data revealed at 7th day after spraying imidacloprid (0.81 jassids /three leaves) recorded lower number of jassid population which was at par with acetamiprid (2.27 jassids /three leaves) and deltamethrin (2.74 jassids/three leaves). The maximum number of jassids were found in control (30.59 jassids/three leaves). Pooled data (Table 1) showed that the jassid population recorded at different intervals revealed that minimum (4.71 jassids/three leaves) counts were made in the plots treated with imidacloprid and acetamiprid (5.63 jassids/three leaves). These two treatments registered significantly less population of the pest in comparison to other treatments evaluated. The higher number of jassids were found in control (28.97 jassids/three

leaves).

The persual of data (Table 2) recorded on first day after spraying indicated that minimum whitefly population was found in treatment imidacloprid (10.39 whiteflies /three leaves) which was at par with acetamiprid (11.81 whiteflies/three leaves) and deltamethrin (12.60 whiteflies/three leaves). The higher number of whiteflies were recorded in control (26.81 whiteflies/three leaves). Whitefly population recorded at 3rd day after spraying revealed that its minimum (8.59 whiteflies /three leaves) numbers were found in plots sprayed with imidacloprid which was at par with acetamiprid (10.65 whiteflies /three leaves) and deltamethrin (11.02 whiteflies /three leaves). However, control (water spray) recorded highest population of whiteflies (28.62 whiteflies /three leaves). More or less similar trend of treatment effect was observed when the observations repeated at 5th and 7th days after spraying. Pooled data (Table 2) indicated that lower number of whiteflies were observed in imidacloprid (8.08 whiteflies/three leaves) which was at par with acetamiprid (9.97 whiteflies/three leaves) and deltamethrin (10.25 white flies/three leaves). The higher number of whiteflies

Table 1 : Relative bio-efficacy of some newer molecules against jassid (*A. biguttula biguttula*) infesting brinjal

Sr. No.	Treatments	Conc. (%)	Jassids per three leaf (Days after spraying)					Pooled
			Before	1	3	5	7	
1.	Deltamethrin 2.8 EC	0.0028	4.80(23.26)*	3.61(13.05)	3.45(11.96)	2.46(6.06)	1.63(2.74)	2.90(8.45)
2.	Flubendiamide 48 SC	0.0096	5.07(26.83)	4.17(17.57)	3.95(15.76)	3.17(10.24)	3.02(9.22)	3.63(13.20)
3.	Indoxacarb 14.5 SC	0.00725	5.09(26.06)	4.04(16.51)	4.03(16.41)	3.18(10.19)	2.93(9.28)	3.61(13.10)
4.	Chlorantraniliprole 18.5 SC	0.006	5.10(26.23)	4.36(19.26)	4.12(17.18)	3.27(11.43)	3.14(9.94)	3.77(14.45)
5.	Spiromesifen 240 SC	0.192	4.94(24.47)	4.26(18.34)	3.84(14.87)	3.28(10.78)	3.23(10.71)	3.69(13.68)
6.	Imidacloprid 17.8 SL	0.0053	4.88(24.06)	2.66(7.54)	2.64(7.33)	1.76(3.16)	0.75(0.81)	2.11(4.71)
7.	Acetamiprid 20 SP	0.004	5.14(26.67)	2.87(8.41)	2.76(8.07)	1.89(3.78)	1.47(2.27)	2.34(5.63)
8.	Control (Water spray)	–	5.02(26.99)	5.37(28.99)	5.22(27.29)	5.38(28.99)	5.53(30.59)	5.38(28.97)
	S. Em. ±	–	0.49	0.32	0.32	0.30	0.30	0.24
	C.D. (P=0.05)	–	NS	0.96	0.96	0.91	0.92	0.72
	C.V. %	–	16.83	14.01	14.68	17.07	19.33	12.00

*Figures in parenthesis is original value while those outside are square root transformed value

Table 2 : Relative bio-efficacy of some newer molecules against whitefly (*B. tabaci*) infesting brinjal

Sr. No.	Treatments	Conc. (%)	Whitefly per three leaf (Days after spraying)					Pooled
			Before	1	3	5	7	
1.	Deltamethrin 2.8 EC	0.0028	5.27(28.12)*	3.54(12.60)	3.25(10.65)	3.10(9.89)	2.57(6.75)	3.14(9.97)
2.	Flubendiamide 48 SC	0.0096	5.15(26.69)	4.28(18.38)	4.02(16.19)	4.03(16.26)	3.04(9.53)	3.88(15.09)
3.	Indoxacarb 14.5 SC	0.00725	5.29(28.96)	4.18(17.54)	4.06(16.66)	3.96(15.73)	3.21(10.32)	3.88(15.06)
4.	Chlorantraniliprole 18.5 SC	0.006	5.37(28.82)	4.41(20.44)	4.31(19.46)	4.23(18.21)	3.54(13.14)	4.14(17.81)
5.	Spiromesifen 240 SC	0.192	5.33(28.54)	4.11(16.99)	4.04(16.39)	3.64(13.40)	3.30(10.89)	3.79(14.42)
6.	Imidacloprid 17.8 SL	0.0053	5.32(28.61)	3.18(10.39)	2.83(8.59)	2.65(7.92)	2.26(5.44)	2.77(8.08)
7.	Acetamiprid 20 SP	0.004	5.58(31.44)	3.41(11.81)	3.31(11.02)	3.27(10.81)	2.70(7.37)	3.19(10.25)
8.	Control (Water spray)	–	5.54(30.81)	5.17(26.81)	5.35(28.62)	5.55(30.82)	5.31(28.20)	5.35(28.61)
	S. Em.±	–	0.41	0.24	0.33	0.30	0.25	0.26
	C.D. (P=0.05)	–	NS	0.73	0.99	0.90	0.75	0.79
	C.V. %	–	13.36	10.42	14.50	13.47	13.28	11.93

*Figures in parenthesis is original value while those outside are square root transformed value

were recorded in control (28.61 whiteflies/three leaves).

The superiority of imidacloprid against brinjal leafhopper was revealed in present study. Gosalwad *et al.* (2008) found that the imidacloprid 17.8 SL @ 40 g a.i./ha was significantly superior in controlling of brinjal sucking pest like jassid, aphid and whitefly followed by treatment imidacloprid 17.8 SL @ 20 g a.i./ha.

Over all, it can be concluded that imidacloprid 17.8 SL 0.0053 per cent, acetamiprid 20 SP 0.004 per cent, and deltamethrin 2.8 EC 0.0028 per cent recorded comparatively lower incidence of jassid and whitefly found promising insecticides for the management sucking pests.

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