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Bioefficacy of pesticides against spider mite, *Tetranychus urticae* (Koch) (Acari: Tetranychidae) infesting brinjal

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Abstract
An experiment was conducted to test the efficacy of various pesticides against spider mite, *Tetranychus urticae* (Koch) infesting brinjal. Among all the pesticides the treatment fenazaquin 10 EC@0.01% was found superiority over rest of the treatments and registered lowest spider mite population (0.80 mites/leaf), however, the highest spider mite population was recorded in case of control (47.67 mites/leaf). The highest marketable yield of brinjal was obtained in the treatment fenazaquin 10 EC@0.01% (12.96 q/ha) and was statistically superior over the rest of the treatments. The lowest marketable yield was obtained in the case of Control (5.96 q/ha). Further, the higher BCR of 1:9.081 was recorded in the treatment fenazaquin 10 EC@0.01% (T_1) while, the lowest BCR was recorded in case of treatment neem Oil @0.15% (1:0.259) (T_6).

Keywords: Bioefficacy, pesticides against spider mite, infesting brinjal

1. Introduction
Brinjal (*Solanum melongena* L.) is one of the most important vegetable of India. It is a member of family Solanaceae and is a native of India, grown throughout the country and grown in all seasons [1]. In India, the brinjal crop is prone to attack by 44 pests [2]. Among them, shoot and fruit borer, leafhoppers, stem borer, leaf webber, aphids, whitefly, thrips and non-insect pest like mites especially, the spider mites belonging to the family Tetranychidae, are the main bottlenecks in brinjal productivity[3]. Among the non-insect pests, mites are notably notorious pests and gaining tremendous importance in recent years owing to their devastating nature and severe damage potential. Basu and Pramanik [4] ranked red spider mites as a major threat next to fruit and shoot borer in brinjal crop. Altogether, 25 tetranychid mite species have been reported on brinjal from different parts of the world [5]. The two spotted spider mite, *T. urticae* Koch is a cosmopolitan agricultural pest belonging to an assemblage of web-spinning mites. These mites are minute, found in large colonies on the underside of leaves underneath fine silky webs and feed using piercing and sucking process that damages plant cells and tissues. This behaviour leads to the appearance of characteristic yellow chlorotic spots on leaves, photosynthesis declines, stomata remains closed and transpiration decreases, finally affecting the quality and quantitative yield of brinjal crop. The estimated avoidable loss in the yield of brinjal ranged from 26 to 39 per cent under Bangalore conditions [6] and 15.29 to81.10 per cent under south Gujarat conditions [7]. Apart from the use of conventional acaricide against spider mites, many chlorinated hydrocarbons, organophosphates, carbamates and pyrethroids are being used for the control of insect pests in brinjal crop. Most of the newer acaricides are preferred over the conventional ones because these compounds are reasonably promising against a wide range of mite pests with excellent activity on almost all stages of the mites at relatively lower dosages. However, their selectivity towards beneficial insects and natural enemies need to be ascertained. Judicious use of some of these acaricides with diverse mode of action will help us to manage the mite pests more effectively, simultaneously reducing the risk of resistance build up in mite pests [8]. Considering the importance of spider mite, *T. urticae* infesting brinjal, the present study was undertaken to know the effectiveness of some acaricides.

2. Materials and Methods

Field experiments were carried out to evaluate different acaricides against *T. urticae* on brinjal during summer season of the year 2014 to 2016 at College farm of N.M. College of Agriculture, Navsari Agricultural University, Navsari, Gujarat, India. The experiment was laid out in Randomized Block Design with seven acaricidal treatments including control and with three replications. To ascertain the field efficacy of various acaricides against *T. urticae* observations on mite population were recorded by randomly selecting three plants from each plot. From each plant, three leaves one each from top, middle and bottom canopies were sampled and spider mite population which include mobile stage was recorded one day before spraying (pre-treatment) and 3, 7, 10 and 14 days after spraying using a stereo-binocular microscope. The data from the field experiments were subjected to $\sqrt{X+0.5}$ transformation and analyzed statistically for comparing treatments following Analysis of Variance technique (ANOVA) for Randomized Block Design (RBD) and the results were interpreted at 5% level of significance. To compare the efficacy of different chemicals, per cent reduction in the population of the mite (mobile stage) over control was calculated using Henderson and Tilton's formula [9].

3. Results and Discussion

The year wise data on bio-efficacy of different treatments against spider mite, *T. urticae* infecting brinjal are presented hereunder

3.1 Year 2014-15: The pre-treatment population of spider mite *T. urticae* was ranging between 35.82 to 36.86 mites per leaf. One day after application of different treatments, the spider mite population was lowest in the case of treatment T_1 (fenazaquin 10 EC@0.01%) (29.65 mites per leaf) (Table 1). This was statistically superior over the rest of the treatments, while the maximum spider mite population was recorded in the treatment T_7 (Control) (38.19 mites per leaf). Further, three days after application of first spray the maximum reduction in spider mite was recorded in the treatment T_1 (fenazaquin 10 EC@0.01%) (24.04 mites per leaf), it was found statistically superior over the rest of the treatments, however the maximum spider mite population was recorded in case of T_7 (Control) (37.51 mites per leaf). Seven Days after first spray, the highest reduction in spider mite population was recorded in the treatment T_1 (fenazaquin 10 EC@0.01%) (18.14 mites per leaf) and it was found statistically superior over the rest of the treatments. The maximum spider mite population was however recorded in case of control (37.34 mites per leaf). Further, 14 days after the first spray, the spider mite population was least in case of treatments T_1 (fenazaquin 10 EC@0.01%) (9.59 mites per leaf) and was statistically superior over other treatments, while the maximum spider mite population was recorded in case of Control (37.66 mite per leaf). Likewise, one day after second spray, the spider mite was lowest in the treatment fenazaquin 10 EC@0.01% (T_1) (8.03 mites per leaf) and it was found statistically superior over rest of the treatments, however, the highest spider mite population was noticed in case of Control (36.34 mites per leaf). Three Days after the application of second spray, the spider mite population was lowest in the case of the treatment fenazaquin 10 EC@0.01% (5.69 mites per leaf). Further, seven days after application of second spray the lowest spider mite population was noticed in case of treatment fenazaquin 10 EC@0.01% (T_1) (3.04 mites per leaf) and it was statistically superior over rest of the treatments, while the maximum spider mite population was recorded in case of treatment T_7 *i.e.* Control. Furthermore, 14 days after second spray, the treatment T_1 *i.e.* fenazaquin 10 EC@0.01% maintain its superiority over rest of the treatments in terms of reduction in the spider mite population and it was found most superior over the rest of the treatments (1.03 mites per leaf). However, the maximum spider mite population was noticed in case of control (35.67 mites per leaf). In case of marketable fruit yield, the highest fruit yield of 11.43 q/ha was obtained from the plots treated with treatment T_1 (fenazaquin 10 EC@0.01%) and was statistically superior over the rest of the treatments while, it was followed by T_2 *i.e.* diafenthiuron 50 WP@0.75% (11.35 q/ha) and was statistically at par with T_3 propargite 57 EC @0.057% (10.13 q/ha). The lowest marketable fruit yield was obtained from the control (5.85 q/ha) (Table 1).

3.2 Year 2015-16: During the second year, the pre-treatment count of spider mite was ranging between 39.44 to 41.07 mites per leaf (Table 2). One day after the first spray, all the treatments were found superior over the control in terms of reducing the spider mite population, however among all the treatments the treatment T_1 (fenazaquin 10 EC@0.01%) showed its superiority in reducing the spider mite population and it was statically superior over the rest of the treatments. Three days after first spray, the treatment fenazaquin 10 EC@0.01% (T_1) was found most effective in reducing the spider mite population (22.45 mite per leaf) and was followed by T_2 (diafenthiuron 50 WP@0.075%) (28.40 mites per leaf) however, the highest spider mite population was recorded in case of control (40.42 mites per leaf). Seven days after the application of first spray, the spider mite population was lowest in case of T_1 (15.47 mites per leaf) and was statistically superior over rest of the treatments however, the spider mite population was maximum in case of control (40.33 mites per leaf). Further, 14 days after first spray, the treatment T_1 *i.e.* fenazaquin 10 EC@0.01% maintain its superiority over rest of the treatments and the lowest spider mite population was noticed in the treatment T_1 (fenazaquin 10 EC@0.01%) (9.07 mites per leaf), whereas, the maximum spider mite population was noticed in the treatment T_1 (fenazaquin 10 EC@0.01%) (9.07 mites per leaf), the spider mite population was maximum in case of control (40.33 mites per leaf). Further, one day after the second spray all the treatments were found superior as compared to control, however treatment (T_1: fenazaquin 10 EC@0.01%) showed its superiority over rest of the treatments and recorded lowest spider mite population (8.37 mite per leaf). Three days after the second spray, the same trend were noticed, where the treatment T_1 *i.e.* fenazaquin 10 EC@0.01% maintain its superiority and recorded lowest spider mite population (6.04 mite per leaf), while in case of T_7 *i.e.* control maximum spider mite population was recorded (39.46 mites per leaf). Seven days after the second spray, the lowest spider mite population was recorded in treatment T_1 (fenazaquin 10 EC@0.01%) (3.72 mites per leaf) and was found to be most effective in reducing the spider mite population. Further, 14 days after the second spray, the treatment T_1 (fenazaquin 10 EC@0.01%) maintains its effectiveness in terms of spider mite population reduction and it recorded lowest spider mite population (0.70 mite per leaf) and was statistically superior over rest of the treatments, however the maximum spider mite population was recorded in case of untreated control (38.67 mites per leaf). In terms of marketable yield of brinjal fruits, the maximum fruit yield

was obtained from the treatment T_1 (fenazaquin 10 EC@0.01%) (13.54 q/ha) and was followed by diafenthiuron 50 WP@ 0.075% (10.19 q/ha) and propargite 57 EC@ 0.057% (10.07q/ha) and were at par with each other. The lowest marketable brinjal fruit yield was recorded in case of untreated control *i.e.*6.07 q/ha (Table 2).

3.3 Year 2016-17: During third year of the experiment, the pre-treatment count of spider mite before first spray was ranging between 39.00 to 41.00 mites per leaf (Table 3). One days after the first spray, the lowest spider mite population was recorded in the treatment T_1 (fenazaquin 10 EC@0.01%) (23.88 mites per leaf) and it was statistically superior over rest of the treatments. However, the maximum spider mite population was recorded in the treatment T_7 (Control) (44.67 mites per leaf). Three days after the first spray, the treatment T_1 (fenazaquin 10 EC@0.01%) maintains its superiority over rest of the treatments and the lowest spider mite population was recorded from this treatments (23.67 mites per leaf), while maximum spider mite population was noticed in T_7 (Control) (40.67 mites per leaf). Seven days after the first spray, the lowest spider mite population was noticed in the treatment T_1 (fenazaquin 10 EC@0.01%) (17.34 mites per leaf) and was significantly superior over rest of the treatments, while the higher spider mite population was recorded in case of control (40.34 mites per leaf). 14 days after first spray, the lowest spider mite population was recorded in the treatment fenazaquin 10 EC@0.01% (9.34 mites per leaf) and was statistically superior over rest of the treatments. The maximum spider mite population was recorded in the control (40.33 mites per leaf). Likewise, one day after the application of second spray, the spider mite population was lowest in the treatment T_1 (fenazaquin 10 EC@0.01%) (10.00 mites per leaf) and was statistically superior over rest of the treatments. However, the maximum spider mite population was recorded in the treatment T_7 *i.e.* control (39.34 mites per leaf). Three days after the second spray, the treatment T_1 (fenazaquin 10 EC@0.01%) maintains its superiority over rest of the treatments by registering a lowest spider mite population (8.00 mites per leaf) and was found statistically superior over the rest of the treatments. However, the spider mite population was maximum in case of control (39.34 mites per leaf). Seven days after second spray, the treatments T_1 and was found most superior over rest of the treatments and recorded lowest spider mite population (5.34 mites per leaf). However, the maximum spider mite population was recorded in the treatment T_7 (control) (40.67 mites per leaf). Further, 14 days after second spray, similar trends were noticed, where treatment T_1 maintains its superiority over the rest of the treatments (0.67 mite per leaf), however the maximum spider mite population was observed in case of control (38.67 mites per leaf) (Table 3). The maximum marketable fruit yield were recorded in case of treatment T_1 (fenazaquin 10 EC@0.01%) (13.91 q/ha) and was found statistically superior over rest of the treatments and was followed by T_2 diafenthiuron 50 WP@ 0.075% (11.04 q/ha), however the lowest marketable fruit yield was obtained in treatment T_7 (control) (5.95 q/ha) (Table 3).

The pooled over data of three years were presented in Table 4, showed that the pre-treatment population of spider mite was ranging between 39.00 to 41.00 mites per leaf. One day after first spray, all the treatments were found effective in reducing the spider mite population as compared to control, however the lowest spider mite population was recorded in the treatment T_1 (fenazaquin 10 EC@0.01%) (23.88 mites/leaf) and it was statistically superior over rest of the treatments. The maximum spider mite population was recorded in case of control (44.67 mites/leaf). Three days after first spray, the maximum reduction in spider mite population was noticed in T_1 (fenazaquin 10 EC@0.01%) (23.67 mites/leaf) and was superior over rest of the treatments, while seven days after first spray, the treatment T_1 maintain its effectiveness over rest of the treatments and was statistically superior over rest of the treatments (17.34 mites per leaf). Further, 14 days after first spray, the same trend were noticed and the lowest spider mite population were recorded in T_1 (fenazaquin 10 EC@0.01%) (9.34 mites/leaf), however, the maximum population of spider mite was recorded in control (40.33 mites/leaf). One day after the second spray, the lowest spider mite population was recorded in T_1 (fenazaquin 10 EC@0.01%) (8.80 mites/leaf), whereas the maximum spider mite population was recorded in the treatment T_7 (37.84 mites/leaf). Three days after the second spray, the lowest spider mite population was recorded in T_1 (fenazaquin 10 EC@0.01%) (6.58 mites/leaf) and was found statistically superior over rest of the treatments (36.82 mites/leaf). Seven days after the second spray the lowest spider mite population was noticed in treatment T_1 (fenazaquin 10 EC@0.01%) (4.03 mites/leaf) and it was superior over rest of the treatments, while the maximum spider mite population was recorded in the treatment T_7 *i.e.* control (39.17 mites per leaf). Likewise, 14 days after the second spray, the treatment T_1 (fenazaquin 10 EC@0.01%) maintain its superiority over rest of the treatments and registered lowest spider mite population (0.80 mite/leaf), however, the highest spider mite population was recorded in case T_7 (47.67 mites/leaf) (Table 4). The highest marketable brinjal yield was obtained in the treatment T_1 (fenazaquin 10 EC@0.01%) (12.96 q/ha) and was statistically superior over rest of the treatments, and was followed by T_2 *i.e.* diafenthiuron 50 WP@ 0.075% (10.33 q/ha) and it was at par with the treatment T_3 propargite 57 EC @ 0.057% (10.14 q/ha). The lowest marketable yield was recorded in T_7 (control) (5.96 q/ha) (Table 4). The present study was comparable with Tomar and Singh [10] who observed that application of propargite 57% EC @1000 ml./ha and fenpyroximate 5% EC @500 ml./ha was significantly more effective in reducing *T. urticae* population and also obtaining higher fruit yield of okra. Mishra [11] also stated that fenazaquin at 125 and 150 g.a.i./ha registered significantly lower mite population followed by dicofol at 250 g.a.i./ha with significantly higher tomato fruit yield. The acaricide fenazaquin was also found superior over other treatments in controlling *T. urticae* on ridge gourd [12] and cucumber [13] grown in greenhouse. Sangeetha and Ramaraju [14] at Coimbatore found fenazaquin at 125 and 150 g/ha as most effective on okra against *T. urticae*, and the mite was effectively controlled by spraying fenazaquin at 0.0025% on polyhouse roses in Punjab [15]. Further, the results on the reduction in spider mite population in the present studies are also in agreement to those of Shah and Shukla [16] and Pokle and Shukla [17] who also found fenazaquin (0.01%) and propargite (0.05%) to be effective in managing the spider mite, *T. urticae* infesting gerbera and polyhouse tomato at Navsari, south Gujarat.

3.4 Economics: The economics of various treatments were presented in the Table 4. The highest net gain of Rs. 97938.56/ha was obtained from the treatment T_1 (fenazaquin 10 EC@0.01%) and was followed by T_2 (diafenthiuron 50 WP@0.075%) (Rs. 87611.06) and T_3 (propargite 57

EC@0.057%) (Rs. 83191.06/ha). The higher net profit over control of Rs. 38338.56/ha was also recorded from the treatment T_1 and was followed by T_2 (Rs. 28011.06/ha) and T_3 (Rs. 23591.06/ha), while it was lowest in case of T_6 *i.e.* neem oil 1500 ppm@ 0.15 % (Rs. 639.11/ha). The higher BCR of 1:9.081 was recorded in the treatment T_1 (fenazaquin 10 EC@ 0.01%) and was followed by T_2 diafenthiuron 50 WP@ 0.075% (1:6.164) and T_3 propargite 57 EC@ 0.057% (1: 6.105). However, the lowest BCR was recorded in case of treatment T_6 neem oil 1500 ppm@ 0.15 % (1:0.259).

Table 1: Efficacy of various pesticides against spider mite, *T. urticae* infesting Brinjal (Year 2014-15)

Treatments	Conc.	Pre-treatment count (2 cm² leaf bit)	Spider mite population I spray				Spider mite population II spray				Yield
			1 DAS	3 DAS	7 DAS	14 DAS	1 DAS	3 DAS	7 DAS	14 DAS	Q/ha
T_1-Fenazaquin 10 EC	0.01	6.03 (35.82)	5.49 (29.65)	4.95 (24.04)	4.39 (18.14)	3.17 (9.56)	2.92 (8.02)	2.49 (5.69)	1.93 (3.04)	1.24 (01.03)	11.43
T_2- Diafenthiuron 50 WP	0.075	6.10 (36.79)	5.90 (34.34)	5.55 (30.30)	5.11 (25.67)	4.49 (19.67)	4.23 (17.37)	3.74 (13.47)	3.34 (10.69)	2.43 (5.48)	10.35
T_3-Propargite 57 EC	0.057	6.03 (35.83)	5.94 (34.82)	5.40 (28.70)	4.83 (22.83)	4.45 (19.33)	4.14 (16.67)	3.68 (13.05)	3.19 (9.70)	2.67 (6.67)	10.13
T_4-Ethion 50 EC	0.05	6.06 (36.27)	5.83 (33.51)	5.35 (27.41)	4.88 (23.34)	4.35 (18.45)	4.02 (15.66)	3.63 (12.67)	3.02 (8.68)	2.76 (7.11)	9.29
T_5-Wettable sulphur 80 WP	0.25	6.11 (36.86)	6.03 (35.83)	5.90 (34.32)	5.49 (29.66)	5.11 (25.66)	4.80 (22.51)	4.61 (20.80)	4.34 (18.34)	4.24 (17.46)	8.56
T_6- Neem Oil 1500 ppm	0.15	6.03 (35.86)	5.98 (35.20)	5.85 (33.80)	5.58 (30.67)	5.37 (28.34)	4.85 (23.05)	4.71 (21.66)	4.65 (21.09)	4.53 (20.04)	8.10
T_7- Control	--	6.07 (36.40)	6.22 (38.19)	6.16 (37.51)	6.15 (37.34)	6.18 (37.66)	6.07 (36.34)	6.10 (31.67)	2.04 (37.18)	6.01 (35.67)	5.85
SEm±		0.04	0.09	0.07	0.07	0.08	0.08	0.08	0.11	0.12	0.20
CD at 5%		--	0.27	0.20	0.21	0.24	0.26	0.24	0.34	0.37	0.60
CV (%)		1.20	2.52	2.02	2.24	2.89	3.26	3.30	5.02	6.05	3.72

DAS=days after spray * Figures outside the parenthesis are √x+0.5 transformed value while figures in the parenthesis are original values or re-transformed value.

Table 2: Efficacy of various pesticides against spider mite, *T. urticae* infesting Brinjal (Year 2015-16)

Treatments	Conc.	Pre-treatment count (2 cm² leaf bit)	Spider mite population I spray				Spider mite population II spray				Yield
			1 DAS	3 DAS	7 DAS	14 DAS	1 DAS	3 DAS	7 DAS	14 DAS	Q/ha
T_1-Fenazaquin 10 EC	0.01	6.37 (40.12)	5.53 (30.08)	4.78 (22.45)	3.99 (15.47)	3.09 (9.07)	2.97 (8.37)	2.55 (6.04)	2.04 (3.72)	1.07 (0.70)	13.54
T_2- Diafenthiuron 50 WP	0.075	6.44 (41.05)	5.88 (34.07)	5.37 (28.40)	4.95 (24.04)	3.98 (15.34)	3.72 (13.38)	3.24 (10.06)	2.90 (8.00)	2.61 (6.34)	10.19
T_3-Propargite 57 EC	0.057	6.44 (41.07)	5.13 (17.07)	5.76 (32.31)	5.41 (29.06)	4.85 (23.02)	4.64 (21.03)	4.20 (17.11)	3.82 (14.09)	2.92 (8.03)	10.07
T_4-Ethion 50 EC	0.05	6.31 (39.44)	6.02 (35.70)	5.59 (30.74)	5.25 (27.06)	4.81 (22.67)	4.58 (20.45)	4.19 (17.06)	3.83 (14.22)	3.43 (11.34)	9.46
T_5-Wettable sulphur 80 WP	0.25	6.38 (40.23)	6.13 (37.09)	5.79 (33.06)	5.50 (29.80)	5.16 (27.45)	4.89 (23.39)	4.51 (17.05)	4.10 (16.34)	3.72 (13.33)	8.62
T_6- Neem Oil 1500 ppm	0.15	6.32 (39.47)	6.08 (36.47)	5.82 (33.37)	5.56 (30.44)	5.28 (27.36)	5.12 (25.73)	4.92 (19.83)	4.42 (19.02)	4.02 (15.57)	8.06
T_7- Control	--	6.32 (39.44)	6.48 (41.44)	6.40 (40.42)	6.39 (40.33)	6.45 (41.10)	6.19 (37.84)	6.32 (39.46)	6.34 (39.66)	6.24 (68.67)	6.07
SEm±		0.03	0.05	0.07	0.07	0.07	0.09	0.10	0.13	0.11	0.19
CD at 5%		0.09	0.14	0.23	0.21	0.21	0.29	0.32	0.40	0.34	0.57
CV (%)		0.82	1.34	2.26	2.24	2.45	3.54	4.21	5.70	5.53	3.42

DAS=days after spray * Figures outside the parenthesis are √x+0.5 transformed value while figures in the parenthesis are original values or re-transformed value.

Table 3: Efficacy of various pesticides against spider mite, *T. urticae* infesting Brinjal (Year 2016-17)

Treatments	Conc.	Pre-treatment count (2 cm² leaf bit)	Spider mite population I spray				Spider mite population II spray				Yield
			1 DAS	3 DAS	7 DAS	14 DAS	1 DAS	3 DAS	7 DAS	14 DAS	Q/ha
T_1-Fenazaquin 10 EC	0.01	6.31 (39.33)	5.39 (23.88)	4.92 (23.67)	4.22 (17.34)	3.13 (9.34)	3.23 (10.00)	2.90 (8.00)	2.39 (5.34)	1.05 (0.67)	13.91
T_2- Diafenthiuron 50 WP	0.075	6.44 (41.00)	6.18 (37.67)	5.55 (30.34)	5.02 (24.67)	4.41 (19.00	4.45 (19.34)	3.98 (15.34)	3.49 (11.56)	2.40 (5.33)	11.04
T_3-Propargite 57 EC	0.057	6.42 (40.67)	6.23 (38.34)	5.55 (30.34)	5.15 (26.00)	4.88 (23.34)	4.81 (22.66)	4.60 (20.67)	4.26 (17.66)	3.67 (13.00)	10.21
T_4-Ethion 50 EC	0.05	6.28	6.18	5.49	5.08	4.71	4.60	4.34	4.13	3.29	10.10

		(39.00)	(37.67)	(29.67)	(25.34)	(21.67)	(20.67)	(18.34)	(16.67)	(10.33)	
T_5-Wettable sulphur 80 WP	0.25	6.31 (39.66)	6.18 (37.66)	6.04 (36.00)	5.58 (30.66)	5.08 (25.34)	4.92 (23.66)	4.71 (21.66)	4.49 (19.66)	3.89 (14.87)	9.02
T_6- Neem Oil 1500 ppm	0.15	6.31 (39.34)	6.20 (38.00)	6.07 (36.34)	5.82 (33.34)	5.49 (29.67)	5.40 (28.68)	5.24 (27.00)	5.05 (25.00)	4.74 (22.00)	8.10
T_7- Control	--	6.39 (40.34)	6.42 (44.67)	6.42 (40.67)	6.39 (40.34)	6.39 (40.33)	6.31 (39.34)	6.31 (39.34)	6.42 (40.67)	6.26 (38.67)	5.95
SEm±		0.04	0.07	0.06	0.08	0.09	0.11	0.11	0.15	0.14	0.13
CD at 5%		--	0.21	0.18	0.26	0.28	0.35	0.35	0.45	0.43	0.41
CV (%)		1.10	1.90	1.73	2.76	3.28	4.05	4.33	5.91	6.63	2.38

DAS=days after spray * Figures outside the parenthesis are √x+0.5 transformed value while figures in the parenthesis are original values or re-transformed value.

Table 4: Efficacy of various pesticides against spider mite, *T. urticae* infesting Brinjal (Pooled)

Treatments	Conc. (%)	Pre-treatment count (2 cm^2 leaf bit)	Spider mite population I spray				Spider mite population II spray				Yield (Q/ha)	BCR
			1 DAS	3 DAS	7 DAS	14 DAS	1 DAS	3 DAS	7 DAS	14 DAS		
T_1-Fenazaquin 10 EC	0.01	6.24 (38.36)	5.47 (27.87)	4.89 (23.39)	4.20 (16.98)	3.13 (9.32)	3.04 (8.80)	2.65 (6.58)	2.12 (4.03)	1.12 (0.80)	12.96	
T_2-Diafenthiuron 50 WP	0.075	6.33 (39.61)	5.99 (35.36)	5.49 (29.68)	5.03 (24.79)	4.29 (18.00)	4.13 (16.70)	3.65 (12.96)	3.24 (10.08)	2.48 (5.71)	10.53	9.081
T_3-Propargite 57 EC	0.057	6.29 (39.19)	6.10 (36.74)	5.57 (30.58)	5.14 (25.96)	4.73 (21.90)	4.53 (20.12)	4.16 (16.94)	3.75 (13.82)	3.08 (9.23)	10.14	6.164
T_4-Ethion 50 EC	0.05	6.22 (38.24)	6.01 (35.63)	5.48 (29.87)	5.07 (25.25)	4.62 (20.93)	4.40 (18.93)	4.05 (16.02)	3.66 (13.19)	3.16 (9.59)	9.62	6.105
T_5-Wettable sulphur 80 WP	0.25	6.27 (38.92)	6.11 (36.86)	5.91 (34.46)	5.53 (30.04)	5.12 (26.15)	4.87 (23.19)	4.61 (19.84)	4.31 (18.11)	3.95 (45.56)	8.73	3.196
T_6- Neem Oil 1500 ppm	0.15	6.22 (38.22)	6.09 (36.56)	5.91 (34.50)	5.65 (31.48)	5.38 (28.46)	5.12 (25.82)	4.96 (22.83)	4.70 (21.70)	4.43 (19.20)	8.07	1.089
T_7- Control	--	6.26 (38.73)	6.37 (41.43)	6.33 (39.53)	6.31 (39.34)	6.34 (39.70)	6.19 (37.84)	6.26 (36.82)	6.30 (39.17)	4.18 (47.67)	5.96	0.259
SEm ±T		0.02	0.04	0.07	0.10	0.10	0.11	0.12	0.15	0.18	0.27	-
YT		0.04	0.07	0.07	0.07	0.08	0.10	0.10	0.13	0.12	0.17	-
CD at 5% T		0.06	0.12	0.22	0.32	0.32	0.35	0.38	0.47	0.54	0.82	-
YT		--	--	0.19	0.21	0.23	0.28	0.29	0.38	0.35	0.50	-
CV (%)		1.06	1.97	2.01	2.43	2.89	3.66	4.01	5.60	6.11	3.20	-

DAS=days after spray * Figures outside the parenthesis are √x+0.5 transformed value while figures in the parenthesis are original values or re-transformed value.

4. Conclusion

The efficacy of different pesticides was tested against spider mite, *T. urticae* infesting brinjal under the field conditions. Among all the available pesticides, the treatment comprise with fenazaquin 10 EC@0.01% was found most superior over rest of the treatments in terms of reducing the spider mite population and higher marketable fruit yield of brinjal along with higher BCR and it was followed by diafenthiuron 50 WP@ 0.075% and propargite 57 EC@ 0.057%. However, in terms of BCR the treatment having neem oil 1500 ppm@ 0.15 % was least effective.

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