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RESEARCH NOTE

Efficacy of newer insecticides against pomegranate thrips and natural enemies

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ABSTRACT: The present experiment was carried out at Agroforestry Research Station, S. D. Agricultural University, Sardarkrushinagar during 2019-21 to evaluate the newer insecticide molecules against the pomegranate thrips. The pooled results of three years revealed that the two spray of cyantraniliprole 10.26% OD @ 0.30 ml/L at 15 days interval during the *hastbahar* recorded lowest thrips population (1.95 thrips/ twig) and found significantly superior over rest of the treatments. It was followed by spinosad 45 % SC @ 0.4 ml/L (2.58 thrips/ twig). The pooled results on occurrence of spider revealed that untreated control treatment recorded maximum spider population (0.79 spider/ twig). It was followed by cyantraniliprole 10.26% OD @ 0.20 ml/L and neem oil 1500 ppm whereas the plants treated with lambda cyhalothrin 5% EC 1 ml/L recorded lowest number of spider (0.24 spider/ twig).

Keywords: Pomegranate, thrips, newer molecule, spider, cyantraniliprole

Pomegranate (*Punica granatum* L.) locally known as *anar*, *dadam* or *dalim* is an important fruit crop grown in tropical and subtropical regions of the world. Maharashtra, Gujarat, Uttar Pradesh, Andhra Pradesh, Karnataka, Rajasthan and Tamil Nadu are the major pomegranate growing states of India. Various abiotic and biotic stress played vital role in reducing the fruit yield of pomegranate. The insect pests are a major limiting factor and about 90 species of insects are reported to feed on pomegranate (Gaikwad *et al.,* 2023). Among them, thrips, *Scirtothrips dorsalis* Hood is an economically important pest. Both, nymphs and adults rasp the leaves, tender shoot, immature developing floral parts, fruit and suck the oozing cell sep resulting in to corky appearance of the damaged parts. It can affect any stage of development of the plant thus it is crucial to manage at appropriate time (Balikai *et al*., 2011). Some insecticides are found to be not very effective to manage thrips effectively. Hence the present inspection was carried out to examine the efficacy of new insecticide molecule against pomegranate thrips and their effect on natural enemies.

The pomegranate was raised with recommended agricultural practices. The two spray of insecticides were carried out during the *hastha bahar*. The spray volume was standardized by spraying control treatment with sole application of water. The first spray was carried out at the 50% flowering and second spray was carried out 15 days after first spray. Spraying was done using a knapsack sprayer fitted with a hollow cone nozzle. The thrips population was recorded before spray and 1st, 3rd, 7th, 10th and 15th days after each spray. There were nine treatments including untreated control (Table 1) laid out in a randomized block design.

The nymph and adult populations of thrips were recorded during the vegetative/fruiting stage of the crop from five randomly selected twigs/ plant by tapping the shoot on the black paper and counting the number of thrips during before spray and 1st, 3rd, 7th, 10th and 15th days after each spray. The population of natural enemies (spider) were also recorded during the before spray and 10th and 15th days after each spray. The recorded data were subjected to statistical analysis.

Effect of treatments on thrips

The pooled results on thrips incidence during year 2019-20 presented in table 1 revealed that minimum thrips population (1.66 thrips/ twig) was recorded in plants treated with cyantraniliprole 10.26% OD @ 0.30 ml/L. It was remained at par with spinosad 45 % SC @ 0.4 ml/L (2.09 thrips/ twig), spinosad 45 % SC @ 0.25 ml/L (2.52 thrips/ twig), lambda cyhalothrin 5% EC@ 1.0 ml/L (2.59 thrips/ twig) and cyantraniliprole 10.26% OD @ 0.20 ml/L (2.64 thrips/ twig). The control treatment recorded maximum population of thrips (7.17 thrips/ twig).

The perusal data on pooled results of thrips incidence on pomegranate during year 2020-21 is presented in table 1. The result revealed that lowest thrips population was observed (2.15 thrips/ twig) with cyantraniliprole 10.26% OD @ 0.30 ml/L. It was followed by spinosad 45 % SC @ 0.4 ml/L (3.38 thrips/ twig). The highest thrips population (8.02 thrips/ twig) was observed in untreated

Table 1. Efficacy of insecticides against thrips infesting pomegranate (Pooled over year)

Treatment	Dose (ml/L)	No. of thrips /twig			
		2019-20	2020-21	2021-22	Pooled
Cyantraniliprole 10.26% OD	0.20	1.77^{abc} (2.64)	2.19^{c} (4.30)	2.20^{c} (4.33)	2.05^{d} (3.71)
Cyantraniliprole 10.26% OD	0.30	1.47^{a} (1.66)	1.63^{a} (2.15)	1.59^{a} (2.04)	1.56^{a} (1.95)
Lambdacyhalothrin 5% EC	0.50	1.83^{bcd} (2.86)	2.39^{d} (5.22)	2.23^{c} (4.45)	2.15^{e} (4.12)
Lambdacyhalothrin 5% EC	1.0	1.76^{abc} (2.59)	2.16^{c} (4.17)	1.81^{ab} (2.77)	1.91^{c} (3.14)
Fipronil 5% SC	1.0	1.96^{cd} (3.35)	2.46^{d} (5.53)	2.19^{c} (4.29)	2.20^{e} (4.35)
Spinosad 45% SC	0.25	1.74^{abc} (2.52)	2.09^{bc} (3.87)	2.04^{bc} (3.68)	1.96^{c} (3.33)
Spinosad 45% SC	0.4	1.61^{ab} (2.09)	1.97^{b}(3.38)	1.68^{a} (2.34)	1.75^{b}(2.58)
Neem oil 1500ppm	5.0	2.11^{d} (3.95)	2.50^{d}(5.74)	2.51^{d} (5.79)	2.37^{f} (5.13)
Untreated control	--	2.77^{e} (7.17)	2.92^{e} (8.02)	3.25^{e} (10.07)	2.98^{g} (8.38)
S. Em. ±		0.10	0.06	0.09	0.02
CD (p = 0.05)		0.32	0.21	0.30	0.05
C. V (%)		8.09	8.03	8.10	8.09

* Figures in parenthesis are retransformed values of $\sqrt{x+0.5}$ transformation
Treatment means with the letter(s) in common are not significant by DMRT at 5% level of significance

control. The observation on results of thrips incidence on pomegranate during year 2021-22 presented in table 1 revealed that all the treatments were found significantly superior over control (10.07 thrips/twig/ plant). The least incidence of thrips was observed in plants treated with cyantraniliprole 10.26% OD @ 0.30 ml/L (2.04 thrips/ twig/ plant) and found at par with spinosad 45 % SC @ 0.4 ml/L (2.34 thrips/twig/ plant) and lambda cyhalothrin 5% EC@ 1.0 ml/L (2.77 thrips/twig/ plant).

The perusal data on pooled result of thrips incidence in pomegranate during three years are presented in table 1. The plant treated with cyantraniliprole 10.26% OD @ 0.30 ml/L exhibited lowest population of thrips (1.95 thrips/ twig) and found significantly superior over all other treatments. It was followed by spinosad 45 % SC @ 0.4 ml/L (2.58 thrips/ twig). In the past, Solankar *et al.* (2021) concluded that spray of cyantraniliprole 10.26% OD @ 0.9 ml/ L exhibited lowest thrips population (1.89 thrips/ twig) at Rahuri, Maharashtra. At Prabhani, Maharashtra, Gaikwad *et al*. (2023) noted that plants treated with cyantraniliprole 10.26% OD @ 15 ml/ 10 L recorded lowest number of thrips (1.68 thrips/ twig) which was followed by spinosad 45% SC @ 3.2 ml/ 10 L (1.75 thrips/ twig). From Karnataka, Satyanarayana *et al.* (2023) noted that two spray of Cyantraniliprole 10.26% OD @ 70g.a.i/ha recorded lowest population of thrips (1.22 thrips/ twig) among the seven treatments. The present results on effect of newer molecule on thrips population are in close conformity with the above worker.

Effect of treatments on spiders

The perusal data on occurrence of spider during the 2019-20 presented in table 2 revealed that the maximum number of spider was observed in plant treated with cyantraniliprole 10.26% OD @ 0.20 ml/L (0.84 spider/ twig) while lowest population was observed in plant treated with lambda cyhalothrin 5% EC 1 ml/L (0.17 spider/ twig).

The control plants recorded highest number of spider (0.80 spider/ twig) while plants treated with lambda cyhalothrin 5% EC 1 ml/L recorded lowest number of spider (0.28 spider/ twig) during the year 2020-21 (Table 2). The results on spider population during the year 2021-22 presented in table 2 revealed that maximum population of spider was observed in untreated control

Table 2. Effect of newer molecule on occurrence of spider on pomegranate (Pooled over year)

Treatment	Dose (ml/L)	No. of spider /twig			
		2019-20	2020-21	2021-22	Pooled
Cyantraniliprole 10.26% OD	0.20	1.16^{a} (0.84)	0.97^{b} (0.45)	1.01^{bcd} (0.51)	1.05^{b} (0.59)
Cyantraniliprole 10.26% OD	0.30	1.00^{abc} (0.50)	0.96^{b} (0.43)	0.86^{e} (0.23)	0.94^{ef} (0.39)
Lambdacyhalothrin 5% EC	0.50	0.90^{c} (0.32)	0.94^{b} (0.38)	0.95^{cde} (0.40)	0.93^{ef} (0.36)
Lambdacyhalothrin 5% EC	1.0	0.82^{c} (0.17)	0.88^{b} (0.28)	0.89^{de} (0.28)	0.86^{f} (0.24)
Fipronil 5% SC	1.0	0.93^{bc} (0.36)	0.89^{b} (0.29)	0.92^{de} (0.34)	0.91^{ef} (0.33)
Spinosad 45% SC	0.25	1.01^{abc} (0.52)	1.02^{ab} (0.54)	1.05^{abc} (0.60)	1.03^{bcd} (0.55)
Spinosad 45% SC	0.4	0.96^{bc} (0.41)	1.03^{ab} (0.56)	0.91^{de} (0.32)	0.96^{bde} (0.43)
Neem oil 1500ppm	5.0	1.00^{abc} (0.50)	1.01^{ab} (0.53)	1.12^{ab} (0.75)	1.05^{b} (0.59)
Untreated control	--	1.11^{ab} (0.73)	1.14^{a} (0.80)	1.16^{a} (0.84)	1.14^{a} (0.79)
S. Em. ±		0.06	0.05	0.04	0.03
CD (p = 0. 05)		0.16	0.14	0.12	0.08
C. V (%)		19.38	18.03	14.80	17.52

* Figures in parenthesis are retransformed values of $\sqrt{x + 0.5}$ transformation
Treatment means with the letter(s) in common are not significant by DMRT at 5% level of significance

(0.84 spider/ twig) while minimum population of spider was observed in plants treated with cyantraniliprole 10.26% OD @ 0.30 ml/L (0.23 spider/ twig). The data on pooled over year presented in table 2 revealed that highest population of spider (0.79 spider/twig) was observed in untreated control which was followed with cyantraniliprole 10.26% OD @ 0.20 ml/L and neem oil 1500 ppm. The plants treated with lambda cyhalothrin 5% EC 1 ml/L recorded lowest number of spider (0.24 spider/ twig).

From the above discussion it can be concluded that two spray of cyantraniliprole 10.26% OD @ 0.30 ml/L at 15 days interval found significantly superior for reducing the thrips incidence in pomegranate over the rest of the treatments. Regarding to the spider population, the control plants recorded maximum spiders which was followed cyantraniliprole 10.26% OD @ 0.20 ml/L and neem oil 1500 ppm.

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