
EVALUATION OF DIFFERENT OILS AGAINST THRIPS, *Scirtothrips dorsalis* HOOD IN CHILLI

BAROT, B. V. AND PATEL, J. J.*

MAIN VEGETABLE RESEARCH STATION
ANAND AGRICULTURAL UNIVERSITY, ANAND - 388 110,
GUJARAT, INDIA

*E-mail: jjpatel27664@yahoo.co.in

ABSTRACT

Nine different oils were evaluated for their bio-efficacy against thrips, *Scirtothrips dorsalis* Hood in chilli at Main Vegetable Research Station Farm, Anand Agricultural University, Anand in *Rabi* 2010-11. Of these, neem oil 0.5%, mahuda oil 1%, mineral oil 0.2%, pongamia oil 1% and eucalyptus oil 1% found most effective against thrips, whereas garlic oil 0.1%, mustard oil 1%, castor oil 1% and sesame oil 1% found less effective. Neem oil 0.5% also registered significantly higher green chilli fruit yield (55.65 q/ha) followed by mineral oil 0.2% (54.91 q/ha), mahuda oil 1% (48.43 q/ha), pongamia oil 1% (47.69 q/ha) and eucalyptus oil 1% (46.11 q/ha).

KEY WORDS: chilli, *Capsicum annuum*, thrips, *Scirtothrips dorsalis*, oil

INTRODUCTION

Chilli (*Capsicum annuum* L.) is an important spice as well as vegetable crop grown in India and many parts of the world. Although, the crop has got great export potential besides huge domestic requirement, a number of limiting factors have been attributed for its low productivity. Of the various biotic stresses, ravages caused by insect pests are significant ones. Nearly 25 insects have been recorded attacking chilli in India. Of these, thrips, *Scirtothrips dorsalis* Hood is considered as the most serious and important pest. Both nymphs and adults of thrips cause damage to the crop by scraping the epidermis of the leaves and suck the cell sap, which leads to crinkling and curling of leaves and loss of plant vigour. The incidence of thrips starts from nursery and continues till harvest of the produce (Abdul Kareem *et al.*, 1977 and Saivaraj *et al.*, 1979). Presently more emphasis is being given to the development of suitable strategies based on ecological principles. Hence, the experiment was carried out to evaluate the bio-efficacy of different oils against thrips, *S. dorsalis* in chilli at Main Vegetable Research Station, Anand Agricultural University, Anand in *Rabi* 2010-11.

MATERIALS AND METHODS

Nine different oils (neem oil 0.5%, mineral oil 0.2%, garlic oil 0.1%, pongamia oil 1%, castor oil 1%, sesame oil 1%, eucalyptus oil 1%, mahuda oil 1% and mustard oil 1%) were in a randomized block design replicated thrice in a plot size of 3.0 m x 3.0 m with a spacing of 60 cm x 30 cm. The observations, number of thrips per twig and green chilli fruit yield were recorded. For recording observations, 5 plants were selected randomly in each net plot area and thrips population was recorded from three terminal twigs of each selected plants. The observations on thrips population were made prior to 24 hr of first spray as well as 3, 5 and 7 days after each spray. First spray of respective oil treatments was made on appearance of thrips and subsequent 2 sprays were given at 10 days interval using manually operated Knapsack sprayer with duromist nozzle at a constant pressure of 2.5 kg/cm². Picking wise yield of green chilli fruits were recorded from each plot.

RESULTS AND DISCUSSION

The data pooled over periods over sprays (Table 1) adjudged based on thrips population per twig indicated that all the oil treatments were significantly effective when compared with control after first, second and third sprays as well as in pooled analysis.

There were significant differences among the treatments after 3, 5 and 7 days of spray. Among the different treatments, neem oil recorded significantly lower thrips population (4.47 thrips/twig) than rest of the treatments, except mineral oil (4.74 thrips/twig), mahuda oil (4.84 thrips/twig) and pongamia oil (5.26 thrips/twig), with which it was at par. Eucalyptus oil (5.55 thrips/twig) was also at par with later three oil treatments i.e. mineral oil (4.74 thrips/twig), mahuda oil (4.84 thrips/twig) and pongamia oil (5.26 thrips/twig), but found significantly effective than garlic oil (7.28 thrips/twig), castor oil (7.62 thrips/twig), sesame oil (8.08 thrips/twig) and mustard oil (8.50 thrips/twig). Castor oil was at par with sesame and mustard oil on one hand while with garlic oil on other hand of chronological order of effectiveness.

After second spray, pongamia oil (4.61 thrips/twig), neem oil (4.70 thrips/twig), eucalyptus oil (4.70 thrips/twig), mahuda oil (4.70 thrips/twig) and mineral oil (4.93 thrips/twig) were at par with each other, but found significantly superior by recording lower thrips population as compared to mustard oil (8.26 thrips/twig), garlic oil (8.32 thrips/twig), castor oil (5.56 thrips/twig) and sesame oil (9.11 thrips/twig). These later four treatments did not significantly differ from each other.

The similar trend observed during second spray was obtained after third spray. The oil treatments of mahuda (5.12 thrips/twig), neem (5.21 thrips/twig), pongamia (5.55 thrips/twig), mineral (5.65 thrips/twig) and eucalyptus (6.05 thrips/twig) were at par with each other, but found significantly superior by recording lower thrips population as compared to mustard oil (10.86 thrips/twig), garlic oil (11.13 thrips/twig), castor oil (11.20 thrips/twig) and sesame oil (11.59 thrips/twig). These later four treatments did not significantly differ from each other.

More or less similar trend was noticed in the data pooled over periods over sprays, as found after second and third spray. Neem oil (4.79 thrips/twig), mahuda oil (4.88 thrips/twig), mineral oil (5.12 thrips/twig), pongamia oil (5.16 thrips/twig) and eucalyptus oil (5.40 thrips/twig) were at par with each other, but found significantly superior by recording lower thrips population as compared to garlic oil (8.86 thrips/twig), castor oil (9.05 thrips/twig), mustard oil (9.17 thrips/twig) and sesame oil (9.23 thrips/twig). These later four treatments did not significantly differ from each other.

The data on green chilli fruit yield indicated that all the oil treatments registered significantly higher yield when compared with control. Among the different oil treatments, neem oil registered significantly higher green chilli fruit yield (55.65 q/ha) as compared to garlic oil (37.22 q/ha), castor oil (30.74 q/ha), sesame oil (29.54 q/ha) and mustard oil (28.80 q/ha), but was at par with mineral oil (54.91 q/ha), mahuda oil (48.43 q/ha), pongamia oil (47.69 q/ha) and eucalyptus oil (46.11 q/ha). The later two treatments were at par with garlic oil. The oil treatments of garlic, castor, sesame and mustard were not differed significantly from each other.

It was indicative from the available literature that little work has been done on efficacy of different oils against thrips in chilli except neem oil. Laskar and Ghosh (2005) found that minimum number of thrips in chilli was found in the treatment of alternate spraying of triazophos (1.5 ml/l), dicofol (2.0 ml/l) and neem oil (2.5 ml/l) followed by dicofol (2.0 ml/l), neem oil (2.5 ml/l) and cypermethrin (0.5 ml/l). The reports of Dhal *et al.* (2009) revealed that spraying of neem oil proved its effectiveness in reducing thrips infestation in chilli and increasing the yield. Neem oil 1% and mineral oil 0.2% also found most effective against chilli thrips at Anand (Anon., 2009), Hyderabad (Anon., 2012a), Rahuri (Anon., 2012b) and neem oil at Varanasi (Anon., 2012c).

CONCLUSION

From the present investigation, it can be concluded that among different oils, neem oil 0.5%, mahuda oil 1%, mineral oil 0.2%, pongamia oil 1% and eucalyptus oil 1% found most effective against chilli thrips. Neem oil 0.5% also registered significantly higher green chilli fruit yield (55.65 q/ha) followed by mineral oil 0.2% (54.91 q/ha), mahuda oil 1% (48.43 q/ha), pongamia oil 1% (47.69 q/ha) and eucalyptus oil 1% (46.11 q/ha).

REFERENCES

- Abdul Kareem, A., Thangavel, P. and Balasubramanian, M. (1977). A new mite: *Hemitarsonemus latus* (Banks) (Tarsonemidae: Acarina) as a serious pest on chilli (*Capsicum annum*. L.) in Tamil Nadu. *Pesticides*, **11**: 42-43.
- Anonymous (2009). 28th Annual Research Report of AICRP (VC), IIVR, Varanasi, pp. 180.
- Anonymous (2012a). 30th Annual Research Report of AICRP (VC), IIVR, Varanasi, pp. 320.

Anonymous (2012b). 30th Annual Research Report of AICRP (VC), IIVR, Varanasi, pp 320-321.

Anonymous (2012c). 30th Annual Research Report of AICRP (VC), IIVR, Varanasi, pp 321.

Dhal, A., Tripathy, L., Panda, N. and Dash, S. K. (2009). Efficacy of some insecticides in the management of chilli thrips (*Scirtothrips dorsalis*). *Environ. Eco.*, **27**(2): 838-840.

Laskar, N and Ghosh, S. K. (2005). Efficacy of pesticides on the incidence of thrips, *Scirtothrips dorsalis* and mite, *Polyphagotarsonemus latus* on chilli. *J. Pl. Prot. Environ.*, **2**(2): 80–83.

Saivaraj, K., Kumaraswami, T. and Jayaraj, S. (1979). Evaluation of certain newer insecticides for the control of green peach aphid, *Myzus persicae* on chillies. *Pesticides*, **13**: 20-21.

Table 1: Effectiveness of different oils against thrips, *S. dorsalis* infesting chilli

Treatments (conc.)	Number of Thrips/Twig*				Fruit Yield (q /ha)
	First Spray	Second Spray	Third Spray	Pooled Over Sprays	
Neem oil 0.5%	2.23 ^a (4.47)	2.28 ^a (4.70)	2.39 ^a (5.21)	2.30 ^a (4.79)	55.65 ^a
Mineral oil 0.2%	2.29 ^{ab} (4.74)	2.33 ^a (4.93)	2.48 ^a (5.65)	2.37 ^a (5.12)	54.91 ^a
Garlic oil 0.1%	2.79 ^c (7.28)	2.97 ^b (8.32)	3.41 ^b (11.13)	3.06 ^b (8.86)	37.22 ^{bc}
Pongamia oil 1%	2.40 ^{ab} (5.26)	2.26 ^a (4.61)	2.46 ^a (5.55)	2.38 ^a (5.16)	47.69 ^{ab}
Castor oil 1%	2.85 ^{cd} (7.62)	3.01 ^b (8.56)	3.42 ^b (11.20)	3.09 ^b (9.05)	30.74 ^c
Sesame oil 1%	2.93 ^{cd} (8.08)	3.10 ^b (9.11)	3.33 ^b (10.59)	3.12 ^b (9.23)	29.54 ^c
Eucalyptus oil 1%	2.46 ^b (5.55)	2.28 ^a (4.70)	2.56 ^a (6.05)	2.43 ^a (5.40)	46.11 ^{ab}
Mahuda oil 1%	2.31 ^{ab} (4.84)	2.28 ^a (4.70)	2.37 ^a (5.12)	2.32 ^a (4.88)	48.43 ^a
Mustard oil 1%	3.00 ^d (8.50)	2.96 ^b (8.26)	3.37 ^b (10.86)	3.11 ^b (9.17)	28.80 ^c
Control (Water spray)	3.22 ^e (9.87)	3.86 ^c (14.40)	4.35 ^c (18.42)	3.81 ^c (14.02)	17.13 ^d
ANOVA					
S. Em. + Treat. (T)	0.06	0.09	0.09	0.06	03.65
Periods (P)	0.03	0.04	0.04	0.02	-
Spray (S)	-	-	-	0.02	-
T x P	0.10	0.12	0.14	0.07	-
T x S	-	-	-	0.04	-
T x P x S	-	-	-	0.12	-
C.D. (5%)Treat. (T)	0.19	0.26	0.27	0.16	10.85
Periods (P)	0.09	0.11	0.13	0.06	-
Spray (S)	-	-	-	0.06	-
T x P	NS	NS	NS	NS	-
T x S	-	-	-	0.11	-
T x P x S	-	-	-	NS	-
C.V. (%)	7.17	9.73	8.98	10.25	15.96

Notes: 1.Treatment means with letter(s) in common are not significant at 5 % level of significance in respective column

2.Figures in parentheses are retransformed values; those outside are $\sqrt{x+0.5}$ * transformed values
[MS received: August 03, 2012] [MS accepted: September10, 2012]