PSM
Microbiology

Short Communication 2022 | Volume 7 | Issue 2 | 43-46

Open Access

Article Information

Received: July 20, 2022

Accepted: July 27, 2022

Published: July 31, 2022

Keywords
Agriculture,
Onion,
Thrips *tabcai*,
Insecticides,
Ghayathi.

Authors' Contribution
IA conceived and designed the study; ZAK did literature search, performed data analysis wrote paper; WA revised the paper and review the manuscript.

How to cite
Arshad, I., Khan, Z.A., Ali, W., 2022. Assessment of Field Efficacy of Diverse Insecticides to Encounter Thrips (*Thrips tabaci Lindeman*) Infesting Onion under agro-climatic condition Ghayathi – Abu Dhabi, United Arab Emirates. PSM Microbiol., 7(2): 43-46.

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Assessment of Field Efficacy of Diverse Insecticides to Encounter Thrips (*Thrips tabaci Lindeman*) Infesting Onion under agro-climatic condition Ghayathi – Abu Dhabi, United Arab Emirates

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Abstract:
A research study comprising of field trial was conducted to evaluate the field efficacy of nine various insecticides against the insect of onion thrips in terms of survival of the population of thrips per plant. These insecticides include (Lambda-cyhalothrin 10% @ 0.25 ml/l, acetamiprid 20SP @0.25 g/l, Imidacloprid 70 WG @ 0.25 g/l, Dinotefuran 20 SG @ 0.25 g/l, Thiamethoxam 25 WG @ 0.25 g/lit, Deltamethrin 2.5 EC @ 2 ml/lit, Chloropyrifos 50%, Buprofezin 25 SC @ 2 ml/lit, and Acephate 75 SP @ 1 g/lit) with untreated control. During the trial acetamiprid followed by Chloropyrifos proved their worth by achieving the low survival rate. The spray of acetamiprid 20SP @0.25 g/l achieved the highest yield (24.37 tons/ha) of onion against 11.96 tons/ha in the untreated phase and Chloropyrifos 50% @ 2 ml/lit was also very effective by producing 23.66 tons/ha of onion.

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INTRODUCTION

Onion (*Allium cepa Lindeman*) belongs to Amaryllidaceae family, being rich in nutrients, is grown both in tropical and sub-tropical countries (Ahmed *et al.,* 2011). It is a bulb producing vegetable, it is vulnerable to many pests/insects/ attacks, which reduces its bulb yield and quantity as well (Hosamani *et al.,* 2010). Among them Thrips is the most common invader of onion crop (Mehra and Singh, 2013). Pesticides have been used traditionally in many parts of the world against pest species of insects (Ali *et al.,* 2017; Akhtar *et al.,* 2018; Iqbal and Ashraf, 2019). Plants have defense system that resist against the pathogen attack (Fatima *et al.,* 2018; Tariq and Saleem, 2018).

During the modern era, diverse insecticides are used to encounter insect/pest attack on the crop. Due to increase in resistance power of thrips, it is imperative to augment the standard and quality of insecticides to be improved to avert the attack of thrips against the precious crop (Kadam *et al.,* 2012). The present study was, therefore, undertaken to assess field efficacy of diverse insecticides to encounter thrips (*Thrips tabaci lindeman*) infesting onion under agro-climatic condition Ghayathi City – Abu Dhabi, United Arab Emirates.

MATERIALS AND METHODS

The experimental study was conducted in Ghayathi city of the Emirate of Abu Dhabi, United Arab Emirates. Nine different insecticides i.e. (Lambda-cyhalothrin 10% @ 0.25 ml/l, acetamiprid 20SP @0.25 g/l, Imidacloprid 70 WG @ 0.25 g/l, Dinotefuran 20 SG @ 0.25 g/l, Thiamethoxam 25 WG @ 0.25 g/lit, Deltamethrin 2.5 EC @ 2 ml/lit, Chloropyrifos 50%, Buprofezin 25 SC @ 2 ml/lit, and Acephate 75 SP @ 1 g/lit) were used during experimental study (Sharma and Kaushik, 2010). The trial of these insecticides was conducted in RBD replicated 3 times in the plots sized 3.0x2.0 m, keeping spacing 15x10 cm respectively (Wagh *et al.,* 2016). First spray was applied on the appearance of thrips and subsequent, two sprays were carried out after the interval of 14 days by using Knapsack sprayer with 500 lit of water/ha (Nault and Shelton, 2012). In order to collect at, 5 plants were chosen randomly to count the population of thrips. The 1st observation was taken 1 day before the application of spray and at 3rd, 7th, 14th days after each spray of post count to check the field efficacy of the applied insecticides. The bulb yield was measured from each plot and the obtained post data was processed and analyzed after transforming into square root and fruit yield was evaluated in tons/ha.

RESULTS AND DISCUSSION

All the sprayed insecticides were significantly successful in suppressing the pest population over untreated control. Firstly acetamiprid 20SP @0.25 g/l sprayed, after 3 days it proved wonderful impressive results against the onion thrips it recorded (4.08 thrips/plant) and was found at par with Chloropyrifos 50% (4.85 thrips/plant). The next effective pesticides was Imidacloprid 70 WG @ 0.25 g/l (6.15 thrips/plant), Dinotefuran 20 SG @ 0.25 g/l (7.53 thrips/plant), Lambda-cyhalothrin 10% @ 0.25 ml/l (7.65 thrips/plant), Buprofezin 25 SC @ 2 ml/lit (7.89 thrips/plant), Deltamethrin 2.5 EC @ 2 ml/lit (8.32 thrips/plant), Thiamethoxam 25 WG @ 0.25 g/lit (9.34 thrips/plant), and Acephate 75 SP @ 1 g/lit (10.65 thrips/plant) respectively.

Similar, findings were reported by (Sule *et al.,* 2008), that highest Survival rate of i.e. (97.061) was observed by the application of acetamiprid treatment and the average number of population thrips/plant ranged from (1.82 to 2.52) in treated plot as compared to untreated plots i.e. 26.16 thrips/plant. Similarly trend of field efficacy was observed after 7th and 14th day of each spray, and the lowest mean population was recorded with the spraying of acetamiprid 50EC @.05%(5.86 thrips/plant) was found. The effectiveness Survival population of diverse insecticide used against onion thrips depicted in table 1.

Furthermore, it was seen that the highest yield (24.37 tons/ha) was achieved with the spraying of acetamiprid 20SP @0.25 g/l followed by

Chloropyrifos 50% (23.66 tons/ha), Imidacloprid 70 WG @ 0.25 g/l, Dinotefuran 20 SG @ 0.25 g/l, Lambda-cyhalothrin 10% @ 0.25 ml/l, Buprofezin 25 SC @ 2 ml/lit respectively. The treatment with Deltamethrin 2.5 EC @ 2 ml/lit, Thiamethoxam 25 WG @ 0.25 g/lit, and Acephate 75 SP @ 1 g/lit obtained (20.63, 19.80, and 18.16 tons/ha). The same results was observed by (Mallinath and Biradar, 2015), that the highest yield was obtained by the spraying of acetamiprid 0.05% (73.05%) by applying spray for five time after regular intervals. Likewise the same results was reported by (Kadri and Goud, 2006), that the onion yield was the highest (27.49 tons/ha) by using Imidacloprid.

Table 1. Effect of different insecticides against onion thrips (*T. tabaci*).

S. No	Treatments	Dosage	Survival population of thrips/plant			Yield
			3 DAS	7 DAS	14 DAS	(t/ha)
T_1	Lambda-cyhalothrin 10%	0.25 ml/l	7.65	5.59	8.23	20.75
T_2	Acetamiprid 20 SP	0.25 g/l	4.08	2.67	5.57	24.37
T_3	Imidacloprid 70 WG	0.25 g/l	6.15	4.85	7.83	23.28
T_4	Dinotefuran 20 SG	0.30 g/l	7.53	6.07	9.41	20.90
T_5	Thiamethoxam 25 WG	0.25 g/l	9.34	7.59	10.75	19.80
T_6	Deltamethrin 2.5 EC	2.00 ml/l	8.32	7.25	9.98	20.63
T_7	Chlorpyrifos 50%	2.00 ml/l	4.85	2.99	6.69	23.66
T_8	Buprofezin 25 SC	2.00 ml/l	7.89	6.35	9.72	20.71
T_9	Acephate 75 SP	1.00 g/l	10.65	8.03	11.93	18.16
T_{10}	Untreated (control)	---	27.43	27.31	23.34	11.96
	S.E±	---	0.09	0.08	0.12	---
	CD at 5%	---	0.28	0.25	0.37	---

CONCLUSION

It is concluded that acetamiprid 20SP @0.25 g/l followed by Chloropyrifos 50% @ 2 ml/lit proved their worth by achieving low survival rate thrips per plant. The spray of acetamiprid achieved the highest yield (24.37 tons/ha) of onion against 11.96 tons/ha in untreated phase and Chloropyrifos was also very effective by producing 23.66 tons/ha of onion.

ACKNOWLEDGEMENTS

The authors highly acknowledge and appreciate the efforts of all the participants who engage in this research directly or indirectly.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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