

Original Research Article

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Seasonal Abundance of Thrips, *Thrips tabaci* Lindeman and its Natural Enemies on Kharif Onion

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ABSTRACT

Keywords

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The investigations on Seasonal Abundance of thrips, *Thrips tabaci* Lindeman on Kharif onion and Its Management through Insecticides” were conducted at Horticulture farm, S.K.N. College of Agriculture, Jobner during Kharif, 2016. The incidence of thrips, *T. tabaci* on onion was commenced in the second week of August and reached to its peak in the second week of September. Whereas, the predator, *Coccinella septempunctata* Linn. was commenced in the second week of August and reached to maximum in the third week of September. The temperature and relative humidity had non significant correlation with thrips incidence on onion crop whereas, predator *C. septempunctata* possess significant positive correlation ($r=0.726$).

Introduction

Onion, *Allium cepa* L. belongs to the family Alliaceae, is a biennial vegetable grown annually in temperate zone. Onion is one of the oldest edible food sources known to humankind, used as *salad*, recipes, mouth-watering gravies and curries. It has also been used in the traditional Ayurvedic medicines. Onions are very low in calories (just 40 calories per 100 g) and fat rich in soluble dietary fibre. Phyto-chemical compounds *Allium* and *Allyl propyl disulphide* in the onions convert into *Allicin* for reducing blood vessel stiffness by releasing nitric oxide (NO) and there by brings reduction in the total

blood pressure (Kumar, 2016). They are also a good source of antioxidant flavonoid quercetin, which is found to have anticarcinogenic, anti-inflammatory, and anti-diabetic functions. They are good in antioxidant vitamin, vitamin- C and minerals. Onion contains about energy 2 per cent, carbohydrates 7 per cent, protein 2 per cent, fat 0.5 per cent, vitamin C 12 per cent and minerals 3.21 per cent. India is the second largest producer of onion in the world next after China but the productivity of onion in India is very low.

Thrips infest onion crop throughout the crop seasons. However, there was significant

variation in thrips numbers between the crop seasons. Dry weather (30.3 mm rainfall) with moderately high temperatures (15.6-28.20⁰ C) increased thrips population, while wet season (391mm rainfall) with moderately high relative humidity was negatively correlated with thrips population (Waiganjo, 2008).

Materials and Methods

The present investigations were conducted at Horticulture farm, S.K.N. College of Agriculture, Jobner (Rajasthan) on onion crop during the *Kharif*, 2016. Jobner is situated on longitude of 75.28 East latitude, 26.26 North latitude and at an elevation of 427 m above mean sea level (MSL) in Jaipur district of Rajasthan. The alluvial soils are present in Western and North-western parts of Jaipur, whereas, Sierozones are present in Eastern parts of the district.

To record the seasonal abundance of thrips, *T. tabaci* and its natural enemies on *kharif* onion crop, the bulb of onion variety Agrifound Dark Red of onion was sown in the mid July, 2016, in five plots of 1.5 x 1.5 m² size, keeping row to row and plant to plant distance of 15 x 10 cm., respectively. The observation of thrips, *T. tabaci* and its natural enemies on onion crop were recorded right from their appearance to harvesting of the crop at weekly interval. The populations of thrips, *T. tabaci* were recorded in the early morning hours. Ten plants were randomly selected and tagged in each plot. The thrips were tapped on the white sheet and the populations were counted by naked eyes (Swami *et al.*, 2013) or by using magnifying lens (Kumawat, 2009). The populations of natural enemies were also recorded on the same plants.

Results and Discussion

During the field experimentation, the incidence of thrips commenced in the first

week of August (2.64 thrips/ plant) which gradually increased and reached to peak in the second week of September (31.32 thrips/ plant) at 34.9⁰C maximum, 22.4⁰C minimum temperature and 54.0 per cent relative humidity being, the most favourable for buildup of population thereafter, thrips population declined and completely disappeared in the second week of October. The present findings are partial agreement with those of Anonymous (2001) reported that population of thrips on onion reached to maximum in August during *Kharif* season and touched the lowest in October. Chhatrola *et al.*, (2003) reported that thrips population was active throughout the season on onion crop. Neergude *et al.*, (2014) reported that seasonal incidence of thrips in *Kharif* season especially during August to October, support the above findings (Table 1 and 2).

The weather parameters *viz.*, maximum and minimum temperature, relative humidity and rainfall play a significant role in planning the pest management schedules. In the present study the incidence of thrips was not affected by weather parameters significantly however, temperature and relative humidity, rainfall showed non significant positive and negative correlation, respectively with thrips incidence on onion crop. The present results are in agreement with those of Ghosh *et al.*, (2005) who reported that relative humidity had non significant correlation with thrips incidence on onion crop however, temperature showed significant positive correlation. Chhatrola *et al.*, (2003) reported that temperature had non significant correlation with thrips population and relative humidity had significant negative correlation, support the present findings.

The present study also corroborate with those of Domiciano *et al.*, (1993) who reported that thrips population in onion crop was negatively correlated with relative humidity and positively correlated with temperature.

Table.1 Seasonal abundance of onion thrips, *T. tabaci* on onion crop in relation to environmental factors during Kharif, 2016

S.No.	Standard Meteorological Week (SMW)	Date of observations	Mean population of thrips (per plant)	Mean population of <i>C. septempunctata</i> Linn. (per plot)	Temperature (°C)		Relative humidity (%)	Rain fall (mm)
					Maximum	Minimum		
					1	32		
2	33	15.08.17	6.12	0.12	31.9	24.2	79	003.8
3	34	22.08.17	13.20	1.40	30.5	24.4	69	017.4
4	35	29.09.17	21.56	2.20	32.7	24.4	63	016.6
5	36	05.09.17	28.32	2.60	32.3	22.5	60	000.0
6	37	12.09.17	31.32	3.40	34.9	22.4	54	000.0
7	38	19.09.17	29.12	2.80	37.9	23.3	67	000.0
8	39	26.10.17	26.00	2.00	37.1	22.7	53	000.0
9	40	03.10.17	18.28	1.40	34.3	23.6	41	013.2
10	41	10.10.17	9.12	1.20	35.2	20.6	43	000.0

Table.2 Correlation coefficient of biotic/ abiotic factors with mean thrips population

Biotic/ Abiotic factors :	Mean <i>Coccinella septempunctata</i> Linn.	Temperature (°C)		Relative Humidity (%)	Rainfall (mm)
		Maximum	Minimum		
Correlation with mean thrips population:	0.961	0.543	-0.314	-0.398	-0.407

The biotic factors particularly coccinellid predators played a significant role in reducing the infestation of sucking pests. In the present investigation, coccinellid predator, *Coccinella septempunctata* Linn. was first observed in the third week of August (0.12/ ten plant) and reached maximum during third week of September (3.4/ ten plant). The population persisted as long as the thrips population was

observed on the crop. The population of *C. septempunctata* was significant positively correlated ($r = 0.961$) with thrips population. The present finding partially corroborate with that of Kadri and Goud (2005) who reported that coccinellids were major predator of thrips and possessed positive correlation with thrips incidence.

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