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## Seasonal incidence of onion thrips, *Thrips tabacci* (Lindeman) (Thysanoptera: Thripidae) on onion in Western Maharashtra, India

**SA Salunkhe, RB Kapare and SA Nevgi**

### Abstract

An investigation was undertaken to study seasonal abundance of onion thrips, *Thrips tabacci* on field onion in Western Maharashtra, India. The results showed that the infestation level of *Thrips tabacci* was low during the early phenological cycle of the crop. However, with the advancement of the crop, it was developed. Recorded population data was correlated with weather parameters. It was noticed that in *Rabi* correlation of nymph and adult population pest per plant. The infestation of onion thrips was positively significant with maximum temperature and minimum temperature. The thrips infestation was negatively significant correlated with morning humidity and evening relative humidity. The infestation of onion thrips increased with increase in maximum temperature and minimum temperature.

**Keywords:** onion thrips, *Thrips tabacci* (Lindeman) weather parameter, correlation, seasonal abundance

### 1. Introduction

Onion (*Allium cepa* Lindeman.) is one of the most important vegetable crops among the various bulbs producing vegetables. It is a member of Amaryllidaceae family which is commercially grown in tropical and subtropical countries. Among the vegetable crops grown in the country, onion assumes significance in the national economy by occupying third position, next to potato and tomato crops. It is grown for consumption as vegetable crop in green immature stage and also as mature bulbs. It is popular as salad crop and consumed in different preparations in every house hold. It is one of the few versatile vegetable crops that can be kept for a fairly long period and can safely with stand the hazards of rough handling, including long distance transport.

The major onion producing countries are China, India, Japan, Spain, Turkey and Brazil. India is the second largest onion growing country in the world with approximately 12.04 lakh ha area with an annual production 194.02 of lakh MT during 2016-17 (Anonymous, 2016). Maharashtra, Karnataka, Madhya Pradesh, Gujrat and Bihar are the major onion growing states in the country. Maharashtra is leading state in onion cultivation with an area of 5,70,000 ha contributing 38 per cent with national share in area and 58 per cent in production.

This pest recorded in many states of India, information about its seasonal incidence and correlation with weather parameters in such diverse Indian climatic situation is still scares. So, this study was carried out to know the incidence and damage level of *T. tabacci* in *Rabi* season.

### 2. Materials and Methods

#### 2.1 Location of experiment

The study of seasonal incidence of onion thrips and its correlation with different weather parameters was carried out in the field experiment at the All India Co-ordinated Research Project on Vegetable Crops, Department of Horticulture, MPKV, Rahuri, Dist: Ahmednagar during *Rabi*, 2016. All the recommended cultivation practices were followed during the period of investigation except, plant protection measures.

#### 2.2 Method of recording observations

For recording observations, five plants were selected randomly from each treatment. The observations were recorded at 0 day (pre count) and 3<sup>rd</sup>, 7<sup>th</sup> and 14<sup>th</sup> day after each spray. Three sprays were given at an interval of fifteen days starting from the thrips population at

ETL. Observations were recorded as suggested by Mote (1981).

### 2.3 Correlation with weather parameters

The observations on number of adult per plant, were correlated with six different weather parameters like total maximum temperature (OC), minimum temperature (OC), morning relative humidity (%), evening relative humidity (%) and bright sunshine hours (hour/day), rainfall (mm). Multiple regression analysis was also performed with same parameters. The weekly meteorological data were collected from nearest observatory from farmer field i.e. from Department of

Agronomy, MPKV, Rahuri, Dist: Ahmednagar

### 3. Results

#### 3.1 Seasonal incidence of onion thrips in relation to weather parameters rabi 2

The infestation of thrips was first observed at 2<sup>nd</sup> week after transplanting in 2<sup>nd</sup> MW, with population of 3.20 thrips/plant. The higher level of infestation was noticed from 13 MW to 17 MW. The peak infestation of 40 thrips/plant was recorded in 15 MW. The data pertaining the population dynamics of onion thrips and there correlation with weather parameters

**Table 1:** Seasonal incidence of onion thrips in relation to weather parameters

Date of observations	Thrips/pl	Temperature (°C)		Relative humidity (%)		Sun Shine (hrs)
		Maximum	Minimum	Morning	Evening	
11.1.2017	3.20	29.20	8.70	56.40	27.90	9.60
18.1.2017	5.43	29.30	9.30	57.30	34.00	9.40
25.1.2017	13.86	26.50	8.90	60.60	34.00	6.70
1.2.2017	20.30	28.80	13.50	68.10	39.30	9.40
8.2.2017	24.83	31.00	13.00	61.90	30.00	9.90
15.2.2017	27.00	31.30	12.80	59.40	27.90	9.50
22.2.2017	30.33	31.70	13.60	59.40	32.00	9.70
1.3.2017	34.43	32.30	13.90	52.60	26.10	10.70
8.3.2017	34.90	34.60	13.80	45.30	20.60	9.80
15.3.2017	35.10	34.60	14.00	41.30	14.90	9.10
22.3.2017	33.50	32.80	13.90	47.10	22.60	9.20
29.3.2017	34.60	33.00	13.60	32.90	16.60	9.10
5.4.2017	38.30	36.10	17.20	38.00	14.90	9.10
12.4.2017	40.10	39.90	21.00	40.60	14.60	9.30
19.4.2017	39.80	38.50	17.40	37.90	14.60	10.10
26.4.2017	40.10	39.50	18.00	30.70	11.10	10.70
3.5.2017	39.50	41.30	20.60	35.70	11.60	10.60

#### 3.2 Correlation between Population of thrips with weather parameters in rabi season 2016-17

The infestation of onion thrips was positively significant with maximum temperature ( $r = 0.8163$ ) and minimum temperature ( $r = 0.8570$ ). The thrips infestation was negatively significant correlated with morning humidity ( $r = -0.7183$ ) and evening relative humidity ( $r = -0.7720$ ). The infestation of onion thrips increased with increase in maximum temperature and minimum temperature.

**Table 3:** Correlation between population of thrips with weather parameters in rabi season 2016-17

Weather parameters	Correlation coefficient value (Thrips)
Maximum temperature	0.8163**
Minimum temperature	0.8570**
Morning humidity (%)	-0.7183**
Evening humidity (%)	-0.7720**
Sunshine (BSH)	0.4006

\* = Significant @ 5% (0.4041) \*\* = Significant @ 1% (0.6045)

### 4. Discussion

The above findings are in confirmation with the earlier research work done by [2] who found that seasonal incidence of *T. tabacci* on onion in Maharashtra state. Infestation of *T. tabacci* started in at 2<sup>nd</sup> week after transplanting in 2<sup>nd</sup> MW and increased its infestation in subsequent weeks. Infestation level was low in rabi

seasons during first phonological cycle and at the end of crop cycle *T. tabacci* infestation increased due to rising temperature and availability of food. The negative influence was observed when *T. tabacci* population was correlated with

minimum temperature, rainfall and afternoon relative humidity, also non-significant but positive correlation with maximum temperature. These results gives more corroboration to current findings results were confirmative with [1-4]. Several other researcher reported the initial slow increase in *T. tabacci* population but rapid increase in later period. Also current findings corroborative with findings of [6].

### 5. Conclusion

The studies on seasonal incidence of onion thrips under field condition revealed that, the maximum population of thrips was observed in 14<sup>th</sup> and 16<sup>th</sup> meteorological week (40.10 thrips/plant). The peak population of these pests were during March and April month.

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