INTERNATIONAL JOURNAL OF PLANT PROTECTION | VOLUME 6 | ISSUE 2 | OCTOBER, 2013 | 428-431

IJPP

RESEARCH ARTICLE

Seasonal abundance of onion thrips, *Thrips tabaci* lindeman

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ARITCLE INFO

Received : 26.08.2013
Revised : 27.09.2013
Accepted : 03.10.2013

Key **W**ords :
Onion, Onion thrips, *Thrips tabaci*, Seasonal incidence

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ABSTRACT

An experiment was conducted at University of Agricultural Sciences, Dharwad, Karnataka, India during 2009-2010, 2010- 2011 and 2011- 2012 to find out the thrips population attacking onion sowing at different dates to determine the optimum date(s) of sowing. There were twelve transplants in 2009-2010, sixteen transplants in 2010-2011 and 2011- 2012. Results indicated that in 2009-10, November 1st transplanted seedlings had a peak population of onion thrips in protected (8.95 thrips/plant) as well as in unprotected plots (53.30 thips/plant). Where as in 2010-11 and 2011-12, December 1st transplanted seedlings had a peak population of thrips. *i.e.* 10.75 thrips/plant in protected plot and 55.49 thrips/plant in unprotected plant (2010-11) and 11.58 thrips/plant in protected plot and 57.83 thrips/plant in unprotected plant (2011-12). The seedlings transplanted in *Rabi* season had peak thrips population compared to *Kharif* season transplanting dates. Therefore, the findings of this work revealed that onion thrip in Dharwad, Karnataka breed from November 1st to January 1st with a peak in December.

How to view point the article : Dharmatti, P.R. and Beeraganni, Kavita, M. (2013). Seasonal abundance of onion thrips, *Thrips tabaci* lindeman. *Internat. J. Plant Protec.*, **6**(2) : 428-431.

INTRODUCTION

Edible *Alliums* are important vegetables worldwide. The distinctive flavour of onions is appreciated by people. One of the advantages of onion is that the bulbs can be harvested and sold "green" for salads (Lannoy, 2001), while the mature bulbs are cooked or eaten raw as vegetable (Straub and Emmett, 1992).

Onions and related Allium crops are subjected to a variety of diseases and attack by arthropod pests that can reduce crop yield and quality (Lorbeer *et al.*, 2002). Probably the most damaging pests worldwide are the insignificant looking thrips. These are slender insects only about 2 mm long as adults. They are found wherever Alliums are grown, but are most severe in the warmer production regions (Brewster, 1994). Soni and Ellis (1990) listed seven species of thrips as Allium pests, the best known of which is *Thrips tabaci*, the onion thrip, which attacks all edible Alliums. Onion thrip has a wide range and populations move from one crop to another when conditions change, such as when neighbouring crops are harvested (Shelton and North, 1986). Thus, the temporal and spatial arrival of onion thrip population into onion fields is variable and relatively unpredictable (Gangaloff, 1999).

According to Kranz *et al*. (1977), the number of thrips on a crop can increase rapidly in dry weather and decrease rapidly after rain. They found that large number of thrips attacking a crop at the seedling stage could cause severe or even total losses with onion. However, once established and growing vigorously, most plants could tolerate feeding damage. The crop may be protected by bringing forward planting date so that the maximum population of thrips does not coincide with the seedling stage. Earlier studies conducted on the insect pests were done in Zaria (Sub-humid zone of Nigeria) by Raheja (1973) which reported that population of thrips gradually built up and reached a peak 50 days after transplanting. Therefore, the experiment was initiated at University of Agricultural Sciences Dharwad during 2010-2012 to study the incidence of

thrips on un sprayed onion crop, to assess the changes in number of thrips on onion transplanted at different times of the growing season and to identify the time of peak incidence and decline.

MATERIAL AND METHODS

The experiments were conducted at University of Agricultural Sciences, Dharwad, Karnataka during 2009- 2010, 2010-2011 and 2011-2012. The transplanting was done at 15 days intervals starting from August 1st to January 15th which were considered as different treatments to find out the thrips incidence. The sites of the experiments remained same in the three years. The design was randomized complete block, replicated three times. The plot size was 1.2 m × 5 m in spacing of 15 cm × 10 cm. Recommended dose of NPK fertilizers in the form of urea, triple super phosphate and muriate of potash + 30 t FYM/ha was applied during the final land preparation in each transplanting. The plots were divided into protected and unprotected plots where protected plants were sprayed with systemic insecticides and fungicides to control the trips population and diseases and unprotected plots were kept free from spraying for the purpose of comparing the population of thrips in both the plots.

The onion plants of different sowing dates were closely examined at weekly interval commencing from germination till harvest. Twenty plants were selected randomly from each plot and tagged. Data on the first appearance of major insect pests in the field were recorded. The data were later statistically analyzed.

RESULTS AND DISCUSSION

Table 1 and Fig. 1 show that during 2009-2010, the mean number of thrips population was highest in November 1st transplanting date *i.e.* 8.95 thrips/plant and 53.3 thrips/plant in protected and unprotected plots, respectively. The lowest population of thrips was observed in the January transplanted onion plants. The present findings agree with Ibrahim and Adesiyun (2010) that the thrips population was at its peak in the onion transplanted during the month of November.

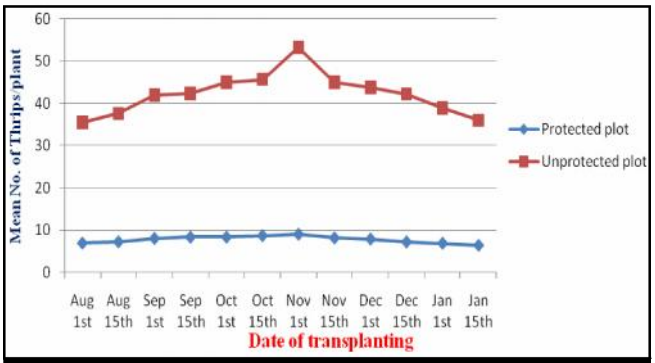

Fig. 1 : Mean number of thrips population /plant during 2009- 2010

Table 1 : Mean number of thrips population/plant during 2009-2010

Date of planting	No. of thrips population	
	Both	No spray
August 1st	6.91	35.55
August 15th	7.21	37.67
Sept. 1st	7.98	42.06
Sept. 15th	8.27	42.37
Oct. 1st	8.28	44.98
Oct. 15th	8.63	45.73
Nov. 1st	8.95	53.30
Nov. 15th	8.10	44.98
Dec. 1st	7.84	43.76
Dec. 15th	7.19	42.29
Jan. 1st	6.88	39.05
Jan. 15th	6.40	36.10
S.Em +	0.16	0.31
C.D. at 0.05	0.47	0.90
C.D. at 0.01	0.64	1.23
C.V. (%)	3.58	1.26

Table 2 : Mean number of thrips population/plant during 2010-2011

Date of planting	Thrips population	
	Unprotected	Protected
June 1st	20.86	4.10
June 15th	21.51	5.06
July 1st	20.62	4.44
July 15th	24.76	5.48
August 1st	27.60	6.59
August 15th	29.15	8.19
Sept. 1st	32.34	8.25
Sept. 15th	36.41	8.59
Oct. 1st	38.24	8.84
Oct. 15th	41.69	9.11
Nov. 1st	48.44	9.44
Nov. 15th	51.80	10.03
Dec. 1st	55.49	10.75
Dec. 15th	51.17	8.92
Jan. 1st	49.50	8.67
Jan. 15th	47.03	8.45
S.Em ±	0.95	0.30
C.D. at 5%	2.75	0.87
C.V. (%)	4.43	6.68

Table 2 and Fig. 2 reveal that during 2010-2011, the peak population was observed in December 1st transplanted onion plants *i.e.* 10.75 thrips/plant in protected plot and 55.49 thrips/plant in protected plots followed by November 1st and December 15th transplanting. The lowest thrips incidence was

Fig. 2 : Mean number of thrips population /plant during 2010- 2011

Table 3 : Mean number of thrips population/plant during 2011-2012

Date of planting	Thrips population	
	Unprotected	Protected
June 1st	23.21	5.03
June 15th	23.72	6.02
July 1st	22.07	5.15
July 15th	28.08	5.83
August 1st	27.07	6.86
August 15th	29.02	8.40
Sept. 1st	33.37	8.75
Sept. 15th	35.82	8.53
Oct. 1st	39.58	8.95
Oct. 15th	33.63	10.70
Nov. 1st	53.72	9.15
Nov. 15th	54.98	12.01
Dec. 1st	57.83	11.58
Dec. 15th	56.57	8.31
Jan. 1st	47.50	8.22
Jan. 15th	46.67	8.82
S.Em ±	3.76	0.45
C.D. at 5%	10.85	1.29
C.V. (%)	18.39	10.07

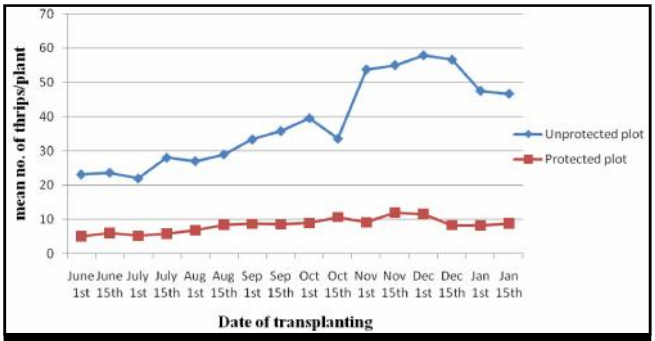

Fig. 3 : Mean number of thrips population /plant during 2011- 2012

observed in June 1st transplanting followed by July 1st transplanting date. Similarly, during 2011-2012, the peak population of thrips was recorded in December 1st transplanted onion *i.e.* 11.58 thrips/plant in protected plot and 57.83 thrips/plant in unprotected plot. Lowest mean population of thrips was observed in July 1st in unprotected and June 1st transplanted onion plants (Table 3 and Fig. 3).

Reuda and Shelton (2003) reported that from June-September heavy rains maintained thrips population at low levels. Salguero-Navas *et al*. (1991) found that host plant phenology plays an important role in population dynamics, with younger plants being able to support greater densities than older plants. Earlier transplanting made in November to December had peaks towards the end of the season.

Conclusion :

The research has given the population dynamics of onion thrips in the three years (2000-2003), and has indicated that the November and December transplants *i.e. Rabi* season planting had peak of onion thrips till the time of harvest and the low population was observed during *Kharif* season plantings (June to September) later on the population built up gradually.

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