

## Review Paper on Management of Onion Thrips

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**ABSTRACT:** Onion thrips *Thrips tabaci* Lindman, belong to the order Thysanoptera and is a worldwide pest of onion. They cause both direct and indirect damage to the crop by feeding and ovipositing, which is laying eggs, on the leaves that cause onion to be un-marketed and reduce in the size of the bulb of the onion. Onion thrips can also transmit different diseases like IYSV (Iris Yellow Spot Virus), which results in the loss of yield of by reducing the size of the bulb and its quality.

**KEYWORDS:** Thrips, *thrips tabaci* L. Thysanoptera, KVK.

### I. INTRODUCTION

The Student's Project is an important part of our studies in which a student does a research programme or a project on a particular plant or a plant pest or a plant disease. This project has taught me the management, biological aspect and the control of Onion Thrips in a day to day where we see the impact of this pest on a crop. During this period of time, I have gone through the surveys and the field visits of different farmers and a KVK in my district. This study was totally on Onion Thrips (*Thrips tabaci* L.).

This pest is found in almost every part of the world and Mediterranean region is its native place. This was recognized as a major pest in onions by Mound and Walker in 1997 when it was widespread throughout the entire world and has been recognized as an agricultural pest.

For the outbreak of this pest, hot and dry weather is most favourable by the pest. This increases its population and the severity of thrips injury to onion. Water has shown great effect on the reduction of the pests. Like rain, in which the mortality of the pests increase wash away the pest from the plant. Water stress in a plant has also shown the proof to the increase in number of thrips in plant and thus reduction in quality of onion to the harvesting and storage period.

I have been working on the pest from five different farmers' fields on which I have been monitoring from the initial stages of the onion. I have chosen a village where which the people are

rich in farming and where I could find the onion fields all around. Malangpora is village in district Pulwama, where I have studied on the onion fields from different farmers and has found the thrips in just one field. The village is located 12 km from the centre of the district and from my hometown; it is located 18 km away. In the village, almost everyone is busy with the farming. Onion fields were seen at every place at this period and farmers were friendly and cooperative and let me survey their fields.

### II. REVIEW OF LITERATURE

Onion thrips (*Thrips tabaci* L.) is an agricultural pest on commercially produced onion (*Allium cepa* L.). It belongs to the order Thysanoptera, and causes significant yield loss. The pest status of onion thrips can be attributed to its polyphagous nature, high reproduction rate, short generation time and parthenogenesis is there in the pest and may develop resistance to the pesticide. Extensive feeding by onion thrips not only results in plant stunting and reduced bulb weight, but it also predisposes onion plants to various fungal and bacterial pathogens that further decrease yield. Onion thrips also transmits Iris yellow spot virus (IYSV) (Bunyaviridae: Tospovirus), which further exacerbates the damage they cause and can ultimately result in complete crop failure.

#### Geographical Location

Onion thrips is a global pest of onion grown in every part of the world. This pest is a native of Mediterranean region and has now become a major agricultural pest. Severe damage to the various crops, not only for the onion crop, has been reported in Africa, Asia, Europe, North and South America and Australia.

#### Environmental Effects on Outbreak of Onion Thrips

Hot and dry weather can lead to an increase in onion thrips populations and the severity of thrips injury to onion. The reason behind this is likely a combination of factors including a shorter generation time and a reduction

in mortality from rain and plant pathogens. Heavy rains have been shown to wash onion thrips from plants. Additionally, water stress may impact the nutritional quality of onion plants and also increases the attractiveness of the plants to thrips.

### Reproduction

Onion thrips can reproduce through both sexually and asexually (Parthenogenesis). Most common mode of reproduction is through thelytoky, which is parthenogenesis, in which females are produced by unfertilized eggs. Onion thrips are also reproduced through arrhenotoky, a parthenogenesis in which males are produced from unfertilized eggs and females are reproduced from fertilized eggs. Onion thrips that reproduce through thelytoky differ genetically from that of arrhenotoky.



### Description of Life Stages

#### Adults

Onion thrips adults emerge from overwintering sites in the spring and may fly to colonize weed hosts and volunteer onion plants before subsequent generations infest onion crops. Winged adults are weak fliers but can fly from plant to plant or be carried long distances via wind. The adult stage overwinters in the soil in onion fields and in small grain and hay fields. Adults are more mobile than immature and pupal stages because they can fly.

#### Eggs

Females lay eggs singly by inserting them into leaf tissue. Only one end of the egg is in proximity to the tissue surface to allow emergence

of immatures. Eggs are microscopic, white or yellow, and kidney-shaped. As eggs mature, they develop an orange tinge and eventually reddish eye spots become evident. On onion, the average length and width of eggs are 0.23mm and 0.08 mm, respectively.

#### Larvae

The first and second instars are active feeding stages. The first instar is small, 0.35–0.38mm in length, semitransparent and dull white, changing later to yellowish white. The second instar is larger and yellow. Larvae are 0.7–0.9mm in length with red eyes. The abdomen is divided into eight distinct segments and has a large posterior segment that is conical in shape. Duration of the first instar varies from 2 to 3 d, and the second instar can range from 3 to 4 d.



#### Pupae

The prepupa and pupa (1.0–1.2mm in length) are relatively inactive, nonfeeding stages. Pupation normally takes place at the base of the onion's apical meristem or within the soil. The average length of the prepupa is 0.9mm and the width is 0.23 mm. The prepupa is whitish-yellow and lasts for 1–3 d. In completely formed pupae, the antennae are folded back over the head and wing pads are well developed. The pupae are yellowish white, changing to yellow before adult emergence. The pupal period varies from 3–10 d among different geographical regions.

### III. FARM VISIT

I have visited the village Malangpora, Pulwama where I have interacted with different (5) farmers and have been visiting their fields frequently for the survey and project on onion thrips. I have been visiting the fields from first week of the March till May first week and have found some of the spots of thrips in some fields.



Thrips were mostly seen on the Umbel (Inflorescence) of the plants and less on the leaves, scales were present only on few leaves. Thrips were seen under the umbel of the plants and silvery lines below the umbel stalk.



In some fields like where other plants were sown like Apple orchards were there along side the onion fields. A farmer had also grown the onion crop with intercropping like potato field was alongside the onion field and some apple trees were also seen there. I asked him why he has done so, she said, "to counter the pests like thrips and mites." In summary, this can be used and is used as cultural control of the thrips if we do intercropping or grow onions alongside with other field crops to counter

act the onion thrips which result in the better commercial production of the onions.



A farmer has done strip cropping like method for growing onions on commercially purpose. He also has planted apple trees (strip) aside the onions and use less amount of pesticides on the onion thrips because they become resistant to some of the pesticides. Here, I have learnt that the farmers already know about the cultural practices to manage thrips and rely less on chemicals which affect the crop and may cause thrips to become resistant to some pesticides.

There is a KVK nearby to the village and they help them in understanding the crops and teach them how to counter the pests and diseases not only of onion crop but of other crops as well. When I was looking and having a tour of the village, I have found that many of the farmers' fields were signed with new variety crops and I asked one of the farmer about it and he said because KVK provide them with the HYV seeds and label that portion of the field with the sign board with the name of the variety and thus help them in every aspect of the field crop problems facing by the farmers in day to day lives.



In the above picture you can see the strip cropping done along side with apple archid strip.



This is a small portion of the onion crop where in the back side of the field, yellowness in the leaves occur and some plants were totally dried up after few weeks after my visit to this field. The reason to that was the deficiency of N in the soil which results in the significant yield loss.

#### IV. MATERIAL AND METHODOLOGY USED

The present investigation was carried out under field condition in the village Malangpora, Pulwama.

##### **Geographical location:**

Village: Malangpora

Block: Awantipora

District: Pulwama

Latitude and Longitude: 33.8918<sup>0</sup> N, 74.9811<sup>0</sup> E

Area: 366.6 hectare

Demography: Urdu language.

##### **Climatic condition:**

Rainfall: 75 cm avg. annual

Relative humidity: 51%

Temperature: 23<sup>0</sup> C avg. annual

The methods used during study are as follows:

1. Selection of the pest (suggested and approved by concerned teacher).
2. Selection of the village.
3. Visiting the village.
4. Interration with farmers.
5. Visiting farmers' fields.
6. Survey of the crop (Onion).
7. Reporting of pest, if any.
8. Researching information regarding pest.
9. Making a report on pest and the survey.

#### V. RESULT AND DISCUSSION

During the course period of time, the survey and visiting of farmer's fields has proven a significant increase in the knowledge and whereabouts of the farming life, how they counter with the day to day lives and how they eradicate a pest if there is a pest on a crop. Onion thrips is a serious agricultural pest which not only occurs on the onion crop but also has great impact on the garlic as well. The damage done by the pest thrips has a huge loss on commercial purpose of the onion because it not only decreases the yield of the crop but also makes the crop unsuitable for edible purpose. The decrease in the size of the bulb, transmission of virus (IYSV) and drying of leaves and eventually the whole plant becomes dry and not able to harvest results in the huge loss of the crop.

Thrips grow or we can say reproduce in hot and dry conditions. Due to the shorter generation time and a reduction in mortality from the rain and plant pathogen, they reduce in number by rainfall. If there is water stress in the field, pest growth increases. Heavy rains have been shown to wash onion thrips from plants.

#### VI. SUMMARY AND CONCLUSION

Onion thrips is one of the most commercial and economical important pests of onion. It has high reproduction rate and a shorter generation time. It has the ability to damage onion plant throughout the onion-growing season pose challenges to developing effective management plants. a combination of prevention and curable control measures outline above should not only help in reduction of damage caused by the thrips but can reduce the spread of plant pathogens and mitigate the development of pesticide resistant.

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