



# Management of Major Insect Pests in Onion Crop

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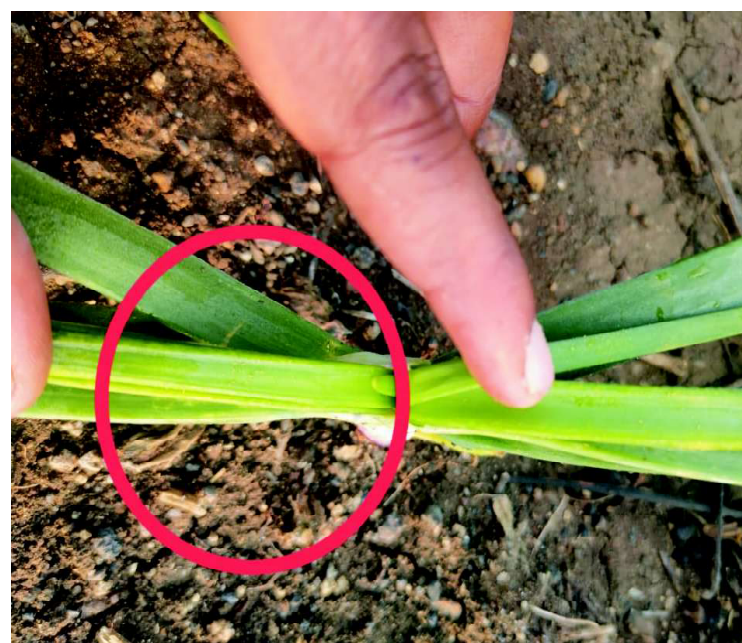
## Introduction

Onion (*Allium cepa* L.) is the most important commercial crop grown all over the world and consumed in various forms. In India, onion has been under cultivation for the last 5,000 years. It is generally used as vegetables, spices. India ranks second to China in area and production in both onion and garlic, but ranks 102<sup>nd</sup> for onion in terms of productivity. This crop is generally grown throughout the country especially in the states of Maharashtra, Uttar Pradesh, Orissa, Gujarat, Madhya Pradesh, Haryana, Punjab, Rajasthan, Uttaranchal, Jammu and Kashmir, Bihar, Andhra Pradesh and Karnataka. The volume of onion production in India is estimated to have amounted to nearly 27 million metric tons. Maharashtra is the largest onion producing state. It's alone accounts for 25% of the country's total production. The onion crop is attacked by many diseases and insect pests at different crop growth stages which causes considerable losses in yield. Apart from reduction in crop yield, the disease and insect pests also poses harmful effects during harvesting and marketing stages, which lower the quality and export potential of the crops that significantly causes the economic loss. The diseases and insect pests alter the cropping pattern and also affect the local markets. All these factors have led to new dimension in research for biological control and integrated approach for the management of plant diseases and insect pests. Important diseases and insect pests affecting the onion crop along with their management are briefly summarized in the present manuscript.

## A) Thrips (*Thrips tabaci*)

It is a tiny insect, which sucks the juice from the onion leaves. The insect is initially yellow which later turns black to brown. Yellowish insects are found in large numbers on onions. "Silver sheen on the leaves shows the damage caused by thrips, *Thrips tabaci*. White spots form on the leaves, these are also known as "Tanks", which later turn yellowish white. Tospo virus, Iris Yellow Spot Virus (IYSV) (Bunyaviridae: Tospovirus) transmitted by onion thrips is also a major threat to economic production of both bulb and seed onion production globally.

Onion thrips thrive in hot, dry conditions and are usually more damaging where these conditions prevail most of the production year. Although thrips feeding during the early bulbing stage is the most damaging to yields, thrips must be controlled before onions reach this stage. Otherwise, populations might exceed levels that can be controlled adequately.



Infestation of thrips



### Management

- a. It is very important that onion seedlings are clean of thrips before transplantation.
- b. Spraying of Deltamethrin at 1 ml/L gives best performance.
- c. Fipronil 5%EC @ 2 ml per litre or fipronil 80% EC @ 2 g per 15 litres of water.
- d. Spinosad 45%SC @ 1 ml/L of water offer best control of this pest.
- d. At high temperature, profenophos @ 2 ml/L gives good control.
- f. Alternately use chemical groups.
- g. Spinosad is a recently discovered insecticide, derived from the fermentation of actinomycetes bacteria, commonly found in soil.
- h. The National Organic Board has recommended that Spinosad be allowed in organic production.

### B) Mites

#### Red Spider Mites (*Tetranychus evansi*)

These are important pest which can cause major losses at all stages of the crop. These organisms are not insects and suck the sap being living underneath the leaves. The colour of the red spider mite may vary from light orange to deep orange brown. These mites can live in the temperatures in between 10°C to 34°C. The total duration of the lifecycle is 14 days at lower temperatures 21°C and less than a week at higher temperatures of 30°C. The mites can be found under surface of the leaves near the leaf veins. They may also move over to the other side also. Sucking sap or feeding makes the leaves yellowish white and mostly mottled. In severe infestations these red spider mites spin webs, first at under surface, later full leaves; sometimes the whole plants will be densely webbed. In high severe conditions the plants may even die.



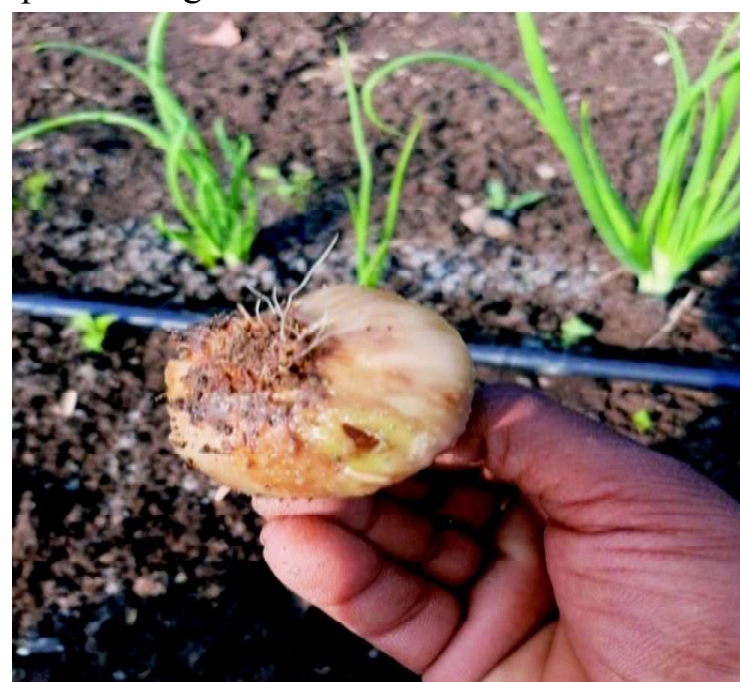
**Mite infested**

### Management

For control of red spider mites in onions, spray neem extract 4% (4 kg neem powder per 100 litres of water) per 10 litres of water or dry sulphur powder on the underside of leaves. Apply 300 mesh sulphur powder @ 8 kg per acre or Abamectin (1.9 EC) mixed with 4 ml or 20 g of water mixed with Sulphur or Kelthane 10 ml or Vertimac 5 ml or Omit 5 ml per 10 litres of water.

### C) White Grub

The larvae are gray in colour and 35 mm long. The larvae of this insect gnaw the underground part of the onion. The plant turns yellow. The infestation of this pest is wide spread in light soils.



**Infested bulb**





## Management

To control the white grub chemically, products such as the organophosphate or carbaryl have shown to be effective against this pest. There are also different chemicals you can use as preventative measures against this pest. Chlorantraniprole, imidachloprid, thiamethoxam, or a combination of imidachloprid and bifenthrin are some good examples. These preventative insecticides should be applied before the white grub hatch from their eggs.

Apply Chlorpyrifos granules at the rate of 10 to 15 kg/ha. Chlorpyrifos 50% + Cypermethrin 5% E.C. Drenching should be done in 2 ml per litre of water.

## Integrated crop protection

- a. After one spray, spray another pesticide at 15-20 days of intervals.
- b. Use certified seeds and processed seeds.
- c. Crops should be rotated.
- d. When spraying apply 0.6 ml of viscous liquid per litre of water in the solution.
- e. Do not use a single pesticide continuously as it increases the resistance in insects. To prevent this, different pesticides should be used alternately.
- f. Onion seedlings planted for seed production should not be sprayed with fungicides or insecticides after flowering.



## Conclusion

This article “Insect management on onion crop” concludes that, Onion crop alone account for 25% country total production. It is majorly infested with Thrips (*Thrips tabaci*), mites and white grub as a minor one. Thrips acts as a vector for viruses such as, tospovirus, IYS Virus which is a major threat to economic production of both bulb and seed of onion production globally. Thrips should be controlled or managed using fipronil. Red spider mites’ infestation can be seen in onion which are found as large numbers underside of leaves, these can be controlled by spraying neem extract or sulphur powder or abamectin. White grub infestation is widespread in light soils and can be controlled by applying chlorpyrifos granules along with cypermethrin.

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