

**Tomato leaf miner *Tuta absoluta* (Meyrick) is a major problem in India and their Integrated Management**

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**Tomato leaf miner *Tuta absoluta* (Meyrick) is a major problem in India and their Integrated Management**

**M.K.Pathak<sup>1</sup>, P.K.Gupta<sup>2</sup>, Sujay Pandey<sup>3</sup>, M.K.Pandey<sup>4</sup>, S.Purushottaman<sup>5</sup>, R.C.Gupta<sup>6</sup>, R.B.Singh<sup>7</sup> and Satyendra Singh<sup>8</sup>**

<sup>1,5,7</sup> National Horticultural Research and Development Foundation, Regional Research Station, Karnal, Haryana 132001 ,

<sup>3,4,6</sup> and <sup>8</sup>National Horticultural Research and Development Foundation, Regional Research Station, Nashik 422003 (Maharashtra).

<sup>2</sup>National Horticultural Research and Development Foundation, New Delhi -110057, India

**Email:** karnal@ nhrdf.com, [pathakmanojkumar1985@gmail.com](mailto:pathakmanojkumar1985@gmail.com)

### Introduction

The tomato pinworm, (*Tuta absoluta*) (Meyrick) (Lepidoptera Gelechidae) is one of the major global destructive invasive pest was observed in Pune on tomato plants grow in polyhouse and field during October 2014 in India. The pest has spread from South America to several parts of Europe, Africa now spread to India. Plants are damaged by direct feeding on leaves, stems buds, young fruits or ripe fruit and by the invasion of the secondary pathogen which through the wounds made by the pest. It can cause up to 90% less of yield and fruit quality under green house and field conditions. *Tuta absoluta* female lays

up to 300 creamy coloured eggs and 10-12 generation in a year. *Tuta absoluta* developed 10 to 30 °C temperature; however, its reproduction and survival were negatively affected at the extreme constant temperature. The temperature variation in natural environments is suitable for this pest to infest tomato crops.

### Damage symptoms

Infestation of *Tuta absoluta* during the entire cropping period feeding damage is caused by the young caterpillar which feed on the leaves forming irregular leaf mines which may later dried. Inside these mines, both the caterpillars and their

dark frass can be found. In case of serious infestation leaves die off completely. The larvae also create

mines in the stem, affecting the plants development and attack green fruit opening them up to entry by disease.



**Severely affected tomato plants and fruits by *Tuta absoluta***

**Management**

*Tuta absoluta* is a very challenging pest to control due to its resistance to pesticide, feeding habit and high

reproduction capacity, which is turn may lead to gene mutation. The use of chemical pesticides was once uses as a sole control method but has been

declining with time .The pest was reported to developed resistance to dozens of pesticides .*Tuta absoluta* are well controlled by a combination of practices that are not fully effective when used alone essential to required an environmentally sound and ecologically sustainable measures like Integrated Pest Management (IPM).

### **Integrated Pest Management**

IPM comprises biological control, modification of cultural practices, physical and mechanical modification, judicious use of chemical and other method of control. Mass trapping using pheromone lure, use of entomopathogenic agent and bio pesticides are some of the tactics that are considered the best option for the management of *Tuta absoluta* following practices are imperative.

### **Cultural practices**

It includes crop rotation, inter cropping with coriander and trap cropping with potato and tobacco crops in which environment condition are altered so that pest attack crop of less economic

importance shows positive effect on reducing pest density and enhancing natural enemies.

### **Physical method**

Main source of pest invasion is the infested seedlings .Therefore use of healthy seedlings is very important for gaining a wealthy stock protecting the tomato seedlings in net house of 1.6 mm mesh size is effective for reducing the infestation of pest during seedlings. The green house or net house must seal properly and screened at vents in the roof and sides. Destroy the damage plant part on regular basis.

### **Use pheromone traps**

Pheromone traps used as the first line of defense to determine the presence o and abundance of insect pest which in turn, helps to determine the correct timing of insecticides application leading to a rational use of pesticides. Pheromone traps involves two main way of insect pest control, mass annihilation and matting disruption, pheromones lure are coupled with sticky traps. The use of 15-20 no of traps /acre at the time of installed 10 days after

transplanting, white and blue sticky trap more effective in capturing moths of *Tuta absoluta* populations.

### Use of plant based pesticides

Plant based pesticides are better over synthetic chemical pesticides as they are environment friendly, biodegradable, easily available, ecologically sound and sustainable. Use of neem oil@4.0ml/L, karanja oil 10ml/L spray at 10 days intervals for effective of *Tuta absoluta*.

### Use of entomopathogenic microbes

Use of microorganism like bacteria, fungi attack the pest by their pathogenic effect leading death of the pest. Use of *Metarhizium anisopliae*@5g/L, *Bacillus subtilis*@5g/L and *B. bassiana*@5g/L spray at 10 days intervals reduce the population of *Tuta absoluta*. Biological control refers to the use of entomophagous insects i.e. predators and parasitoids for the control of pest it is safe effective environment friendly. *Macrolophus pygmaeus*, *oriosis* spp as effective predators and

*Neoremnus artnyes* as a parasitoids effective for this pest.

### Chemical control

The continuous application of chemical insecticide has multiple side effects which range from pesticides resistance development to pesticides residue in food crops. Alternate use of pesticides for avoidance resistance problem in *T. absoluta*. Spray of spinosad @ 0.3 ml/L, deltamethrin@1.0ml/L, thaimethoxam@0.5g/L, chlorpyrifos@1.0ml/L and chlorantraniliprole@0.3ml/L as sequential spray most effective for control of *T. absoluta*. *Tuta absoluta* is a looming problem in tomato production in India. The havoc caused by the pest demands immediate action. The invasive pest is found to develop pesticides resistance against the application of chemical pesticides in the world. Owing to many other sides' effect of chemicals pesticides application have been seeking for an alternative management practices which lower damage of *T. absoluta* along with environment sustainability.