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The Spread Area of Tomato Moth (*Tuta absoluta*) in the Republic of Uzbekistan

[1] Alimukhamedov Saidmurat Sultanovich, [2] Kholdorov Mirkhalil Urazbekovich

[1, 2]Senior Research Officer, Candidate of Biological Sciences,
Scientific-research institute of vegetable, melon and potato growing,
111106, Kuksaray town, Zangiota district, Tashkent region, Uzbekistan
Email – alp.lentinus@yandex.ru

Abstract: *Most literatures have stated about tomato moth damage to the cultural and meadow crops of Solanaceae family in open fields and in greenhouses. Tomato is a favourite crop of this pest and it was studied that if the control measures are not conducted in time, 100% of the yield can be lost. This pest infects the plants during all development phases from their sprouting period to the end of growth, its worm penetrates into the leaves, stalk, flower and fruit of the plant and damages them, the plant dies if it is strongly infected by the pest. As it was stated in scientific references, the development of one generation makes 29-38 days.*

This article outlines monitoring results on tomato moth (Tuta absoluta) spread in Termez district of Surkhandarya region; Taylak district of Samarkand region; Andijan district of Andijan region; in experimental plot of VM and PGRI of Tashkent district and Parkent district of Tashkent region.

Keywords: *tomato, tomato moth (Tuta absoluta), pest, pheromone, monitoring.*

1. INTRODUCTION:

As it was stated in scientific sources, the origin of tomato moth is South America, in 1980 it was determined in all regions of this continent. In recent years tomato moth has spread in Spain, France, Italy, Greece, Malta, Morocco, Algeria, Libya, Turkey, Syria, Lebanon, Jordan, Iran, Egypt, Sudan, Ethiopia, Senegal, Ukraine, Russia and is causing great damage. In 2014 this pest appeared in greenhouse condition of Uzbekistan and coming up to 2015 it started to damage tomato crop in open fields.

Jordan tomato moth *Tuta absoluta* Gelechiidae family has 3-species (*T.absoluta, Keiferia lycopersicella* and *Phthorimaea operculella*) and among them the most harmful one is *T.absoluta* which caused to loss of 30-90% of the yield in some years. It was determined that in climatic condition of Jordan *T.absoluta* female tomato moth can lay 260 pieces of eggs [5, 6].

In Jordan 3 species of *Gelechiidae* family of tomato moth are met in tomato (*T.absoluta, Keiferia lycopersicella* ва *Phthorimaea operculella*), among them *T.absoluta* damages much to the plants, it was illustrated in literatures that in some regions 30-90% of the yield was lost by its damage [5].

It was recommended in the literatures that tomato moth (*T.absoluta*) species are to be identified according to butterfly appearance [2, 10].

Tomato moth (*T.absoluta*) was found in Gomel region of Belorussia, in Krasnodar region of Russia in 2011, and it was included into A1 quarantine insects group.

Under monitoring results it was defined that tomato moth started to damage strongly tomato crops in greenhouses in 2015 and in open fields in 2016 in Tashkent, Navoi, Kashkadarya and Surkhandarya regions of Uzbekistan [1].

The lowest temperature for tomato moth development is 7-9°C degree, if temperature lows from 10°C degree, it stops to form pupa and larva. It can hibernate in egg, pupa and larva form. Tomato moth can produce 9-10 generation during the whole year [3, 6, 8].

It is known that tomato moth causes damage to plants from the sprouting period to the end of plant development [7, 9].

Considering the dependence of pest development on weather condition, hidden worm life stage in the plants (leaves, flower, fruits) and difficulty of control of worms of this pest, it is significant to prove scientifically in the condition of our republic, the management of tomato moth population amount on the base of pheno-monitoring of bio-ecological features of tomato moth, its spread and damage.

2. MATERIALS AND METHODS:

In 2017 the experiments were conducted mostly in Termiz district of Surkhandarya region; in Taylak district of Samarkand region; in Andijan district of Andijan region; in experimental plot of Scientific-research institute of

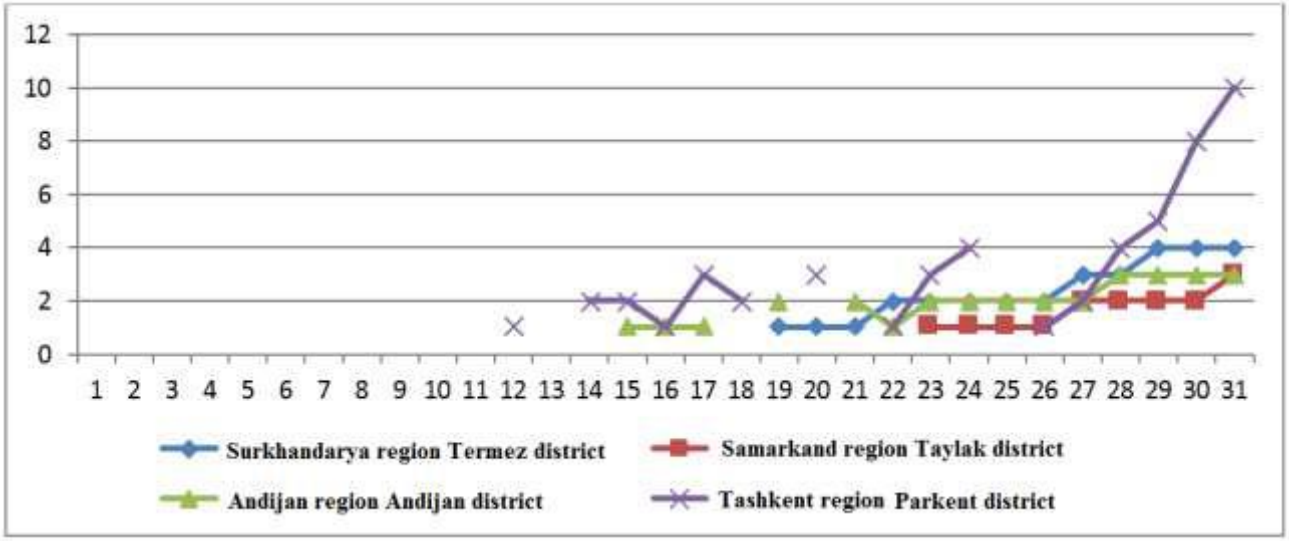
vegetable, melon and potato growing of Tashkent district and Parkent district of Tashkent region on the spread of tomato moth (*Tuta absoluta*). Development dynamics and density were determined with the help of pheromone traps, tomato moth butterfly density was counted everyday on the base of caught butterflies amount on pheromone traps.

3. RESULTS AND DISCUSSION:

In order to determine the spread, development and damage level of tomato moth (*Tuta absoluta*), the monitoring was conducted in May-August months, the obtained data is shown in 1-4 pictures.

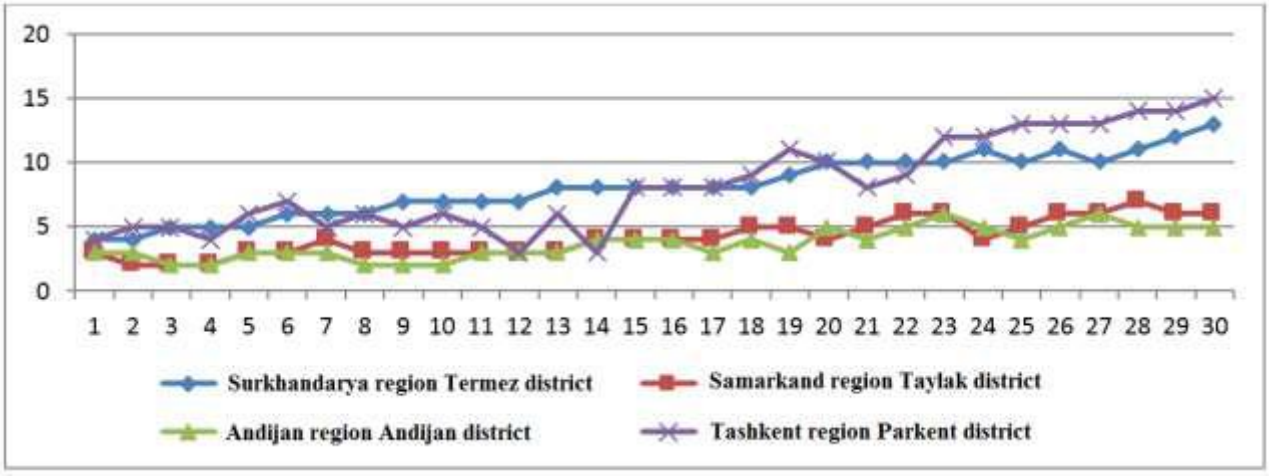
The development of tomato moth in May is illustrated in the 1st picture, Tomato moth development occurred in the 3rd decade of May in tomato crops of experimental plot in Termez district of Surkhandarya region resulting in 1-4 pieces of tomato moth butterflies caught on pheromone traps. While in the 3rd decade of May in control field in Andijan district of Andijan region average 1-3 pieces of tomato moth butterflies were caught on pheromone traps from the 23rd of May. In the 3rd decade of May in Taylak district of Samarkand region 1-3 pieces of tomato moth butterflies were caught on pheromone traps and this processes was observed 10-15 days later than other regions. When the observations were carried out in tomato fields of Parkent district in Tashkent region, tomato moth appeared in the 2nd decade of May. Pheromone traps could catch average 1-10 pieces of tomato moth butterflies in control fields. It happened 10 earlier compared to others.

Fig 1: Development dynamics of tomato moth in May by regions (in 2017)



The 2nd picture illustrates the data of tomato moth spread in Termiz district of Surkhandarya region in tomato crops, in the 1st decade of June tomato moth butterflies were caught on traps by 4-7 pieces, while in the 2nd decade butterfly capture on traps made 7-10 pieces, in the 3rd decade in control fields pheromone traps caught average 10-13 pieces of tomato moth butterflies. It was observed that in the 3rd decade of June this indication increased 2 times than in the 1st decade of June.

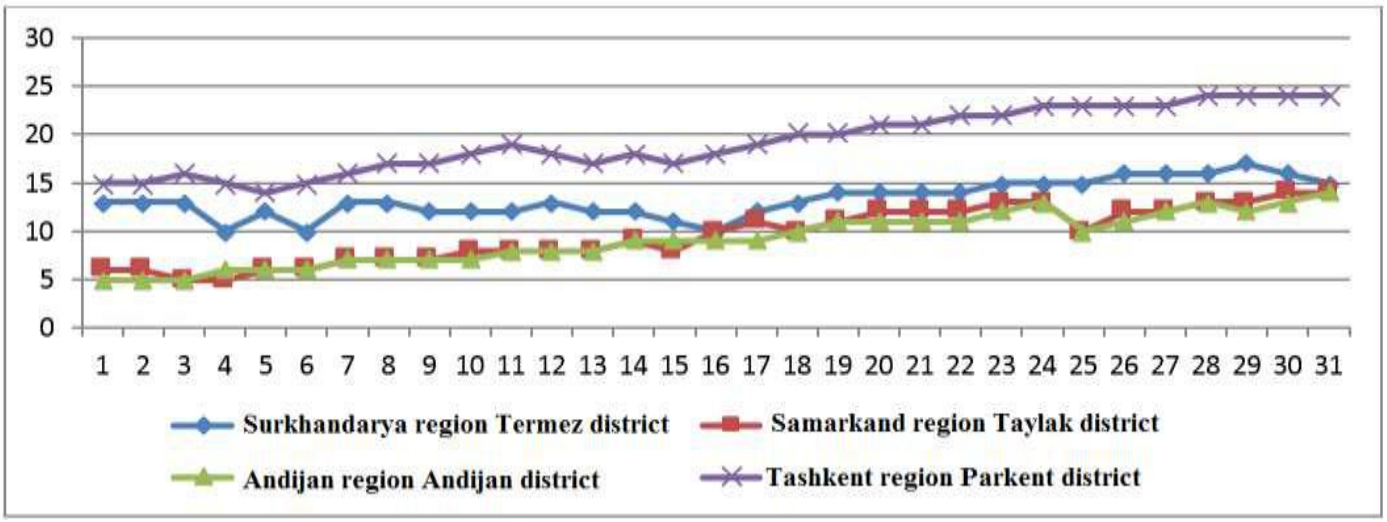
Fig 2: Dynamics of tomato moth development in June month by the regions (in 2017).



In control fields of Andijan district in Andijan region tomato moth butterfly capture on pheromone traps was average 3-6 pieces in the 1-2-3rd decade of June. In Taylak district of Samarkand region in June month this indication showed 3-5 pieces and it was less compared to other regions, butterfly population also occurred later than in others. On the farms of Parkent district in Tashkent region where the tomato crops were planted the observations showed that tomato moth butterflies capture on pheromone traps was 4-15 pieces in control fields, also it was observed that the development of tomato moth occurred earlier than in other regions.

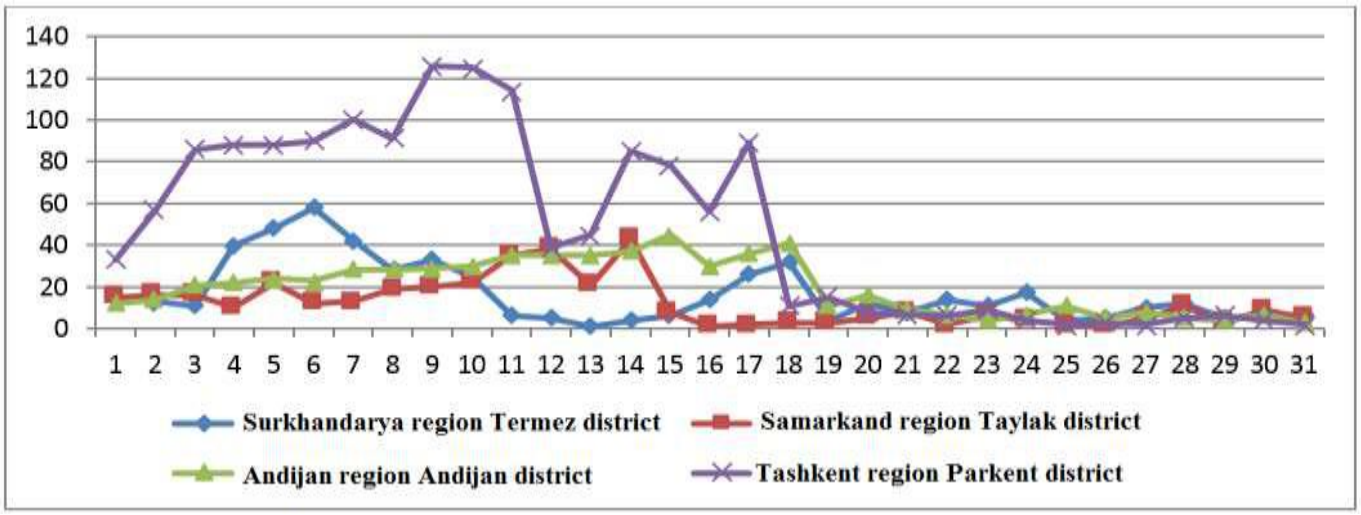
The data in the 3rd picture depicts the capture of tomato moth butterflies on pheromone traps in the 2-3rd decade of July was 12-17 pieces in control tomato fields in Termiz district of Surkhandarya region. While in control fields of Andijan district of Andijan region in July month this indication was average 5-14 pieces of tomato moth butterflies. In Taylak district of Samarkand region in July month 5-14 pieces of tomato moth butterflies were caught on pheromone traps, the pest here started to damage later than in other regions. In tomato fields of the farms in Parkent district of Tashkent region average 13-24 pieces of tomato moth butterflies were caught on traps and tomato moth caused great damage to crops.

Fig 3: Dynamics of the development of tomato moth in July month by regions (in 2017).



The data of the 4th picture shows that in the 1-2nd decade of August month in control tomato fields of Termez district of Surkhandarya region pheromone traps could catch average 15-32 pieces of tomato moth butterflies. While in this period in control fields of Andijan district of Andijan region 12-45 pieces of butterflies were caught on pheromone traps. In Taylak district of Samarkand region in the 1-2 decade of August this indication made 15-43 pieces of tomato moth butterflies. In the 1st decade of August month tomato moth butterflies of 33-126 pieces were caught on traps in tomato fields of Parkent district in Tashkent region. This observations showed that the development and damage of tomato moth were stronger than in other regions.

Fig 4: Dynamics of the development of tomato moth in August month by regions (in 2017).



4. CONCLUSION:

According to monitoring data conducted in the regions in 2017, it was known that the development of tomato moth began in the 3rd decade of May in Surkhandarya, Samarkand, Andijan regions, from the 2-3rd decade of July and the 1-2nd decade of August its quantity increased and caused to strong damage.

In Tashkent region the development of tomato moth began in the 2nd decade of May and from the 1st decade of July the amount increased resulting in great damage to the plants.

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