

TOMATO PEST TUTA ABSOLUTA IN TERMEZ DISTRICT OF SURKHANDARYA REGION. POPULATION-GENETIC MONITORING AND ECONOMIC SIGNIFICANCE**Karim Eshnazarov**

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Annotation. Tomatoes are the most consumed type of vegetables. A number of insects cause serious damage to tomatoes. Among them, the tomato moth is considered a serious pest of leaves and fruits. This article describes the effectiveness of drugs used against tomato moth.

Key words. Tomato, drug, clean product, bioecological control, control, tomato moth, crop, leaf, fruit, damage.

INTRODUCTION. Tomato (Latin: *Solanum lycopersicum*) is an annual, perennial herbaceous plant in tropical climates. It is widely cultivated as a vegetable crop. Although the scientific terminology uses the name tomato, in Uzbekistan both the plant and the fruit are called tomatoes or "pamildori" (among the people). In January-September 2022, Uzbekistan exported about 60 thousand tons of tomatoes worth \$ 45.1 million to 11 foreign countries. The volume of tomato exports decreased by 13 thousand tons compared to the same period in 2021. The countries to which Uzbekistan exported the most tomatoes in the first 9 months of 2022 were: Russia - 29.3 thousand tons; Kazakhstan - 23.8 thousand tons; Kyrgyzstan - 6.3 thousand tons; Tajikistan - 513 tons; Mongolia – 7.7 tons; UAE – 2.5 tons. The regions that exported the most tomatoes abroad in September were: Fergana region – 17 thousand tons; Khorezm region – 12 thousand tons; Bukhara region – 6.7 thousand tons. It is clear that protecting tomatoes from harmful organisms is one of the urgent issues. Tomato moth (*Tuta absoluta*) belongs to the order of Lepidoptera, the family of Gelechiidae. According to available data, in Uzbekistan in 2015 (current) the tomato moth was widely distributed in Bukhara, Navoi and Tashkent regions, and to a lesser extent in the Fergana Valley (prof. Sh.T. Khodjaev, B.Sc. F. Shamsitdinov). It is very likely that the moth has spread to other regions. In some places, farmers have sprayed tomato crops with this pest up to 20 times. The most unfortunate thing is that the harvest from the sprayed crops is immediately sold in the markets without maintaining the expiration date, which is not controlled by SES employees, as a result, there is a high probability that many people who eat such tomatoes are poisoned. Leaves heavily damaged by the moth die completely. The moth can reduce the yield of infected tomato plants by 80-100% and completely destroy the crop. From the day the damage begins, the moth can completely destroy a field of 1 ha in 2 weeks. The larva (worm) is whitish-yellow when it first emerges, 0.5 mm long, with a black head (diagnostic sign), then it grows and becomes light brown or yellowish-green in its 2nd-4th year; it lives 4-15 (on average 8) days, and at this time the 4th year is over. The mature larva is 8-9 mm long, it spins a silken cocoon, falls to the soil and pupates. The pupation takes place in the soil or among plant debris, sometimes on damaged and twisted leaves, in a silky cocoon for 10 days. It can also pupate in the pores of the leaves. The pupa is light brown in color, about 6 mm long. Imago: females live 10-15 days, males 6-7 days. Length 5-7 mm, wingspan 8-10 mm, brown or silvery in color, with characteristic black spots on the front wings, and filamentous (rosary-like) whiskers. The presence of filamentous

(rosary-like) whiskers, silvery-gray scales on the front wings, and characteristic black spots on the front wings are among the most important identification features of the pest. These include the symptoms of the moth larvae during their 1st to 4th instar stage. *Tuta absoluta* is a global invasive pest that mainly damages tomato crops, and its rapid population growth and resistance to pesticides are making it difficult to control. This article presents the results of observations conducted in a closed field in the city of Termez during August, September, and October, and their population genetic and economic significance. Although this observation was carried out without laboratory conditions, practical conclusions were drawn regarding the population dynamics, activation period, and pesticide resistance of the pest.



Research conducted in greenhouses of Termez district

Research methods. The survey was carried out in a closed field. The field was divided into 2 sections, sections 1 and 2 contain 30 main rows and 6 sub-rows each. An average of 145-150 seedlings are planted in each sub-row. Our observation in the field began in August, when soil preparation and disinfection for the crop were carried out, seedlings and cuttings were planted, and observation work was carried out from that time. Samples were collected and tested using pheromone traps and natural methods. Temperature and humidity levels were measured daily. Samples were taken every 25 meters along the diagonal of the field. The degree of damage to the leaves by pests and the time when the plant was severely damaged were monitored. When making calculations, 10 places of the monitored area are placed in a checkerboard pattern along the crop area and each plant (at least 100) is examined. The number of pests per 1 m² was determined based on the M.S. Gilyarov formula.

Research results.i. Results of observations and population dynamics conducted in Termez district in 2024

The following main conclusions were made during the observation, which lasted from August to October:

1. Increase in activity:

– Although the pest was relatively rare in August, 1-3 butterflies were detected in pheromone traps from August 20 to August 30. In the first 10 days of September, up to 3-7 were detected, in the second 10 days, up to 5-12 insects were detected, and in the third 10 days, up to 7-13 were detected. In September, the population increased sharply. This is due to the seasonal temperature comfort and the optimal microclimate of the indoor environment.

– The pest activity continued in October, with 5-11 moths detected in the first 10 days, 4-8 in the second 10 days, and 3-5 in the last 10 days. This indicates that *Tuta absoluta* can survive indoors even in winter.

2. Monitoring with Pheromone Traps:

– Monitoring was carried out using pheromone traps and it was observed how much the pest accumulates each month. The traps helped to effectively control the pest and determine the period of activity.

3. Climate Adaptability:

– Due to the high level of adaptability of the pest, it was found that it is difficult to control it indoors without pesticides.

Novelty and Importance of Population Genetic Analysis

1. Genetic Adaptation and Tolerance

– *Tuta absoluta* populations have the ability to adapt rapidly to pesticides. Population monitoring can determine when and in what periods this adaptation increases. This helps to develop strategies for the rational use of pesticides and chemical rotation.

2. Regional Diversity and Genetic Potential

– The genetic composition of pests can vary from region to region. Observations conducted in the field, when confirmed by laboratory analyses, allow us to understand the level of genetic adaptation of *Tuta absoluta* in this region.

3. Potential for Genetic Confinement in the Closed Field

– Genetic diversity can be limited due to population isolation in closed conditions. By analyzing the results of these observations, the effects of biological control strategies and pheromone traps are evaluated.

Economic Importance of Monitoring

1. Saving Chemicals

– Controlling populations with high levels of pesticide resistance increases pesticide consumption, which places an additional economic burden on agriculture. Based on the results of monitoring, it is recommended to use pesticides only when necessary, which will help reduce costs.

2. Ensuring Yield

– Significant losses can be observed in tomato crops due to *Tuta absoluta*. Identifying the periods of pest activity and taking prompt measures against it will allow maintaining yield.

3. Sustainable Ecological Control Strategies

– Less use of chemicals and use of biological control methods serve to maintain ecological balance. This increases the ecological purity of agricultural products and ensures their competitiveness in the market.

Innovative News and Future Research

1. Integrated Pest Management (IPM)

– This observation provides a basis for developing an integrated pest control strategy through the use of pheromone traps and rational use of pesticides. This control method is cost-effective and reduces environmental impacts.

2. Baseline Data for Genetic Studies

– The results of this observation serve as a valuable source for future genetic analyses conducted in laboratory conditions. Knowing the dynamics of the pest's activation on a monthly basis allows for the identification and comparison of genetic differences.

Conclusion

The results of the observation of *Tuta absoluta* conducted in a closed field in Termez conditions shed light on the population genetic novelty and economic importance of the pest. Since the pest is resistant to pesticides and has seasonal adaptations, it is important to monitor and control its dynamics. Based on the results of the monitoring, farmers can be given instructions on the effective use of pesticides and the use of pheromone traps. If genetic analyses are carried out in the laboratory in the future, the results of this monitoring will serve as a basis for this scientific research. This will allow the development of more effective and sustainable strategies for combating *Tuta absoluta*.

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