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Soil And Climate Of The Research Area Cabbage And Tomato Agrosenoses Of The Conditions Influence On The Development Of Insects (In The Case Of The Ferghana Valley)

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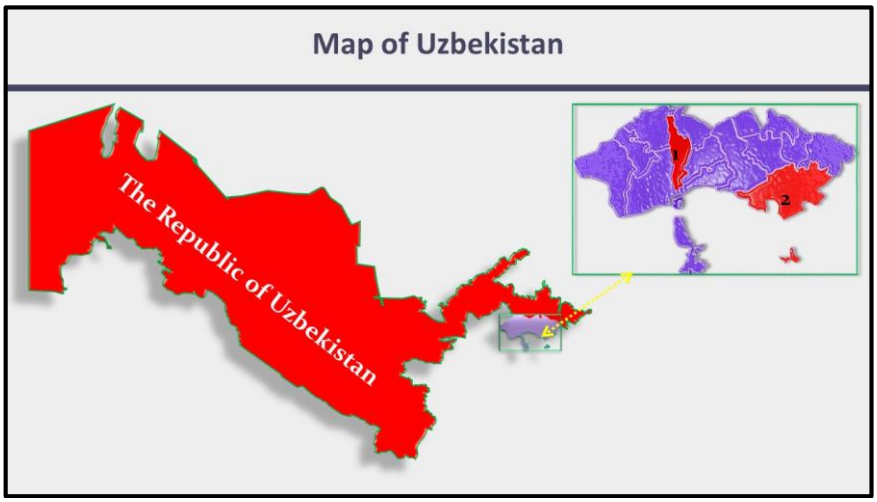
Abstract

This scientific article highlights the natural geographical features of the Fergana Valley, which is considered the largest mountain valley in the Central Asian region. Also, scientific materials about the influence of different soil and climatic conditions of the valley on the bioecology and development of harmful and beneficial insects in cabbage and tomato agrocenoses are given. On the subject some scientific - practical news given .

Keywords: Fergana Valley, its natural geographical features, soil and climatic conditions, cabbage and tomato agrocenoses, cabbage white butterfly, turnip white butterfly, cabbage shrew, entomophages, development dynamics, damage, bioecological features of pests.

Enter.

The Fergana Valley is located in the southeast of Central Asia between the Tianshan and Aloy mountain ranges. It is surrounded by Kurama to the northwest, Chotkal mountain ranges to the north, Fergana to the east, Turkestan to the southwest, and Aloy mountain ranges to the south. On the west side, a narrow plain - Khojand Gate connects the valley with the Turan lowland.
The main part of the Fergana valley consists of high plains, the average height of which is 400 m above sea level. The area gradually decreases from east to west , and the relief decreases from the circumference of the valley towards the center of the valley, i.e. towards the Syrdarya river (1). Such a change in relief prevents the uniform distribution of atmospheric precipitation, solar radiation, soil layer, plant cover , and animal world in the valley.



Literature analysis and methodology

The impact of soil and climate conditions in the Fergana Valley on the development of insects in cabbage and tomato agrocenoses is discussed . The research is primarily aimed at understanding the influence of natural geographical features, climate and soil characteristics on the bioecology and development of both harmful and beneficial insects in the region. The article is rich in empirical data, observations and comparisons from different geographical points of the valley, detailing how changes in these factors affect insect populations.

Includes a variety of historical and contemporary references to support its information . These references help to present the accumulated scientific data and build on existing knowledge of the region, its geographical features and entomological aspects. The inclusion of local data and observations from different parts of the Ferghana Valley also increases the reliability of the study.

The vertical soil-climate regions of the Fergana Valley were divided into 5 groups by N. A. Seversov (9): heaths, cultivated fields, deciduous forests, pine forests, alpine meadow steppes. Later (6,1) it was determined that there will be 4 main regions in the Ferghana Valley; central or plain, hills, foothills and highlands. A.A. Mukhamediev (8) divided the plain, sub-mountain, mid-mountain and high mountain regions in the valley. The agrocenoses of vegetable plants that we are studying - cabbage and tomato fields are typical crops for plains and mountain regions.

The climate of the Fergana Valley is sharply continental and dry. At altitudes from 350 m to 1500 m above sea level, the average annual temperature is from 8.2°C to 14.3°C; the average temperature in July is 26-27°C (maximum 40-42°C), in the foothills it is slightly lower (24.7°C). The first frosts are observed in the plains in the 3rd decade of October (7). Despite the warm winter, absolute minimum temperatures can reach -25-30 °C. Frost-free days are between 199-299 days of the year. Annual precipitation increases from 100 mm in the western and central parts of the valley to 300 mm in the eastern part. In the foothills, the maximum amount reaches 400-600 mm.

Results.

The results of the study show that the time and density of insects in the cabbage and tomato agrocenoses of the Fergana Valley differ significantly depending on the geographical location, soil type and climatic conditions. Key findings include:

1. In foothills and mountainous regions, insects appear earlier than in plains. For example, cabbage white butterfly develops 15-20 days earlier in mountainous areas than in plains.
2. In general, the population density of insects is higher in foothills and plains than in mountainous areas.
3. Soil and climatic conditions affect the availability of food sources for insects, which in turn affects their population density.

also highlights changes in the occurrence and density of entomophages, natural enemies of pests. These changes are due to differences in the local environment.

The points where we made observations differ from each other in terms of natural conditions. These differences affect the flora and fauna of those places (their biological and ecological characteristics, development dynamics, etc.). Below we will dwell on the geographical features of the researched points:
"Navruz" MFY (Fergana region, Uchkoprik district) is located in the western part of the Fergana valley. Strong western winds (Kokan wind, Bekobad wind) significantly affect the climate, flora and fauna of this place. The terrain is mostly flat, and its average height is 400 m above sea level. Adjacent to Central Fergana. The climate is continental, Kurama, Chotkal and Fergana mountain ranges block the northern winds and have a positive effect on the climate of the district. That's why the winter here is warm. The average annual temperature is 13.4-13.6 ^{o} C. In July, it is 27-28 ^{o} C, the maximum is 42 ^{0} C. In winter, the average temperature of January reaches -2.2 ° C, the minimum reaches -23 ° C. The frost-free period lasts 235-240 days. Average annual rainfall is 100-115 mm. The soil is irrigated grassland and loam, and has been cultivated since ancient times (10).
"Fergana" MFY (Fergana region, Fergana district) is located in the south-eastern part of the region at the foot of the Aloy mountains (mountain region). Rel Yefi consists mainly of hills and is located 550 m above sea level. The climate is strictly continental. The average temperature in January is -2.9°C, the minimum temperature is -30°C. The average temperature in July is 25.1°C, the maximum is 42°C. The annual rainfall reaches 200 mm. The soil is mostly gray soil (10).
According to soil and climate conditions, the Fergana Valley was divided into the following regions by R. G. Borozdin, V. V. Kuznesov (7): Kokan, Fergana, Chust-Pop, Andijan, Namangan, Khojand and Osh . Gray, brown, barren, grassland, salty and sandy soils are mainly distributed in these regions. Gray, meadow and gray-meadow soils are found in the Kokan region, which are non-saline (in the upper regions) or less saline (in the lower regions). In the Fergana region, sparsely cultivated light gray soils are distributed.

The soil and climate conditions of the Fergana Valley have a specific effect on the development of harmful and beneficial insects. Cabbage whitefly, one of the main pests of cabbage, spends the winter in the pupal stage. Butterflies emerge from overwintered buds in March. In the foothills of the valley (Fergana district), in 2019, they started flying on March 16, while in the western plains (Uchko'prik district), butterflies were observed on March 20. It was found that the number density of worms is 1-1.5 times higher in the foothills than in the plains. In May (2018), 83 cabbage white butterflies and 13 eggs were found in the cabbage fields of the mountain region (Fergana district), while 7 butterflies were recorded in the plain cabbage fields (Uchkoprik district), no eggs and worms were found.
In the pre-mountainous region, the first generation of cabbage and turnip white butterflies serve as the main food for the imago and caterpillars of the wild budworms. And in West Ferghana , it's boltyrik it was observed that it is the main food (because kurtana and surepka are sparsely distributed in Western Fergana). In Western Fergana, we can explain the low occurrence of 1st generation imago and caterpillars of cabbage and turnip white butterflies with the above-mentioned food problem and natural conditions.

Eggs of the cabbage white butterfly appear in the cabbage agrocenosis from the second half of May in the foothills (19.05. 2018, Fergana district), from the end of May in the central plains (27.05.2018, Fergana district), in June in West Fergana (06.05.2018, Uchkoprik district)
An increase in the density of cabbage white butterfly eggs occurs 3 times a year. In 2017, the number density increased in the foothills in the 2nd ten days of June and the 1st ten days of October (up to 197 worms were counted in 50 seedlings, 19.08.2017, Fergana District); In 2018, in the 3rd ten days of June (up to 296 worms were counted in 50 seedlings, 24.06. 2018. Fergana district), in the first half of August and the 1st ten days of October, in 2019 in July It was observed on the 1st ten days, on the 2nd ten days of August and on the 3rd ten days of September.
In 2017, the peak period of entomophages is the 3rd ten days of June, the 3rd ten days of August and the 2nd half of October; In 2018, the end of June, the first half of August and the first half of October; In 2019, it fell on the first ten days of July, the first half of August and the end of September.
In the cabbage fields of Western Fergana, caterpillars of the cabbage white butterfly appeared at the end of May in 2017 and at the beginning of June in 2018-2019. The increase in the density of worms in the 3rd ten days of June, the 2nd half of August and the 3rd ten days of October in 2017 (up to 106 worms were counted in 50 seedlings, 22.10.2017, Uchkoprik district), 2018 in the second half of June, in the middle of August (up to 133 worms were observed in 50 seedlings, 17.08.2018, Uchkoprik district) and in the second half of October; In 2019, it was observed in early July, late August-early September and October.

In the cabbage fields of Central Fergana, caterpillars of cabbage white butterfly appeared at the beginning of July in 2017 and at the end of May in 2018-2019. The increase in the density of worms in cabbage fields in 2017 in the second half of June, at the end of July, at the end of August and at the beginning of September; In 2018, at the end of June (137-141 worms were counted in 50 seedlings, 24-30.06.2018, Fergana district), in the middle of August, in the period from the end of September to the middle of October; In 2019, it was observed at the beginning of July, the 1st ten days of August and the end of September.

The number density of entomophages increased from the second half of July to August and September.

According to the above information, the caterpillars of the cabbage white butterfly develop 15-20 days earlier in the mountainous region than in the plains .

Despite the fact that the occurrence of turnip whitefly in cabbage fields in the foothills and lowlands is different compared to cabbage whitefly, their appearance is observed almost at the same time (in the middle and second half of May). The number density of these worms is higher in the plains (39-100 pieces in 50 bushels of cabbage, 2017-2019, Uchkoprik district) (29-85 pieces in the foothills, 2017-2019, Fergana district).

In 2017, the increase in the density of turnip whitefly worms in the cabbage fields of the foothills of the Fergana Valley is at the beginning of June, the end of July, the end of September and the beginning of October; In 2018, the end of June, the end of July - the beginning of August and the middle of October; In 2019 , the end of June, the end of July and the beginning of August, the end of September and the beginning of October coincided.

In the cabbage fields of Central Fergana, the caterpillars of the turnip white butterfly appear in the second half of May. Its breeding season in 2017 is mid-June and mid-July, second half of August, late October - early November; In 2018, mid-June, early and late August, late October; In 2019, it fell on the end of June, the end of July, the end of August and the second half of October.

In the cabbage fields of Western Fergana, the turnip white butterfly caterpillars begin to reproduce from the second half of May. Its peak periods are the first half of June, the middle of July, the first half of August and the first half of October in 2017; In 2018, mid-June, late July, mid-August and the first half of October; In 2019, it fell on the end of June, the end of July, the middle of August and the 1st ten days of October.

Entomophages were observed from the second half of June to the middle of September.

Debate:

The Discussion section explores the ecological implications of these data. It acknowledges that the unique geographical features of the Fergana Valley, including the presence of mountains and variations in elevation, create a diverse microclimate that significantly affects insect bioecology. Differences in occurrence and density of pest insects have the potential to affect productivity and require region-specific pest management strategies.

The role of natural enemies such as entomophages and how local conditions influence their dynamics. It is noted that the presence of certain entomophages varies by region, which may affect pest management in different parts of the valley.

Cabbage aphids begin to fly to cabbage fields in the foothills of the Fergana Valley in late April-early May. Its flight to cabbage fields occurs 15-17 days earlier in the foothills (Fergana district) than in the plains (Uchkoprik district) (05.04-05.22.2018). This situation can be explained by the wide distribution of wild flowering plants in the foothills. The increase in the volume density of cabbage juice occurred 2 times in the 1st year, in the first half of July and at the end of September in 2017; In 2018, the end of June was observed in the beginning of July and the first half of September, in 2019 it was observed in the middle of July and the first half of October.

Cabbage juice appears in the cabbage fields of Central Fergana in the second half of May. Its breeding season is the first half of July and the end of September to the beginning of October in 2017; in the second half of June and the second half of September in 2018; In 2019, the end of June coincided with the beginning of July and the middle of October.

In the cabbage fields of Western Fergana, such cases were observed in the first half of July and mid-September in 2017, in the second half of June and mid-September in 2018, in late June-early July and in late September in 2019.

in the density of the complex of entomophages in cabbage agrocenosis occurs twice a year.

The increase in the density of entomophages in the cabbage fields of the foothills of the valley in late June and late September-early October in 2017; In 2018, the end of June to the beginning of July and the end of September to the beginning of October; In 2019, it fell on the end of July-beginning of August and October.

The increase in the density of entomophages in the cabbage fields of Central Fergana in 2017 in the middle of July and the second half of October; In 2018, the end of June-beginning of July and the first half of October; In 2019, it fell on the end of July-beginning of August and the first half of October.
In the cabbage fields of Western Fergana, such cases occurred in late July-early August and late September-early October in 2017; In 2018, it was observed in the second half of July and the end of September-early October, in 2019, it was observed in the second half of July and in the middle of September.

Brachymeria (Brachymeria femorata Panz), a mushroom-eating fungus of cabbage and turnip white butterflies, is not found in all places of the Fergana Valley. While it was less common in the white butterfly bulbs in the cabbage fields of T ogh region (2 cases, July 2018, Fergana district), it was more common in the cabbage fields of West Fergana (12 cases, July 2018, Uchkoprik district). The distribution of this entomophagus in different regions can be attributed to the influence of the environment.

In the tomato field, the big potato aphid appears 4-10 days earlier in the mountain region (Fergana district) than in the plains (Uchkoprik district). It flies to the tomato fields in late April and early May. The increase in the density of the large potato juice occurs twice a year, and the one in late spring and early summer is especially dangerous. The amount of aphids is significantly higher at this time, causing damage to the plants (in autumn, the activity of the potato big aphid is not observed at a high level). Such cases occurred in the middle of June in 2017 and 2019, and in the first half of June in 2018.

In Central Fergana tomato fields, the increase in the density of potato juice was observed in the middle of June in 2017, in the beginning of July in 2018, and in the second half of June in 2019.
In the tomato fields of Western Fergana, the increase in the density of the large potato juice is in the middle of June in 2017, in the end of June-beginning of July in 2018, and in the end of October-beginning of November, in the first half of July in 2019. ri came.

The bollworm appears in the tomato fields of the foothills of the Fergana Valley in the first half of June. The increase in its volume density coincided with the end of July in 2017, the middle of July and the beginning of August in 2018, and the first half of July in 2019.
The bollworm appeared in the tomato fields of Central Fergana in 2017 in the middle of June. Its increase in volume density coincided with the first half of July. In 2018, the bollworm appeared in tomato fields in early June, and the number density increased by the end of June; In 2019, it appeared in the first half of June, and the increase in volume density coincided with the end of June and the beginning of July.

The bollworm appears in the tomato fields of Western Fergana in the first half of June. An increase in its quantity density was observed in the second half of July in 2017, in the first half of July in 2018, and in the beginning and end of July in 2019. According to our research, it was found that the number density of bollworm is higher in the tomato fields of Western Fergana than in the sub-mountain region of Fergana Valley.
In tomato agrocenosis, entomophages appear at the end of May. Their density increases in Central Fergana in late July in 2017, in mid-July in 2018 and 2019; at the end of July-early August in the foothills; In West Fergana, the second half of July coincided with the beginning of August.

Thus, differences in the periods of emergence and increase in density of pests and entomophages in the cabbage and tomato agrocenoses of Fergana Valley, Western and Central Fergana regions are due to the effects of different soil and climatic conditions. depends.

Summary:

Highlights the importance of understanding the interrelationship between soil, climate and geographical features in the formation of insect populations in agricultural ecosystems. It emphasized the need for individual approaches to pest control in the Fergana Valley, taking into account the specific conditions of different regions. By recognizing these changes, farmers and researchers can develop more effective strategies for pest control and crop protection. The study is a valuable contribution to entomology and agriculture by providing information on the complex relationship between insects and their natural environment in the conditions of the Fergana Valley .

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