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<https://doi.org/10.59849/2409-4838.2024.3.69>**DISEASE AND PESTS OF OLIVE (*OLEA L.*) PLANT****Afet Mehman Javadova*¹ , Rukhsare Adil Gasanova² **¹Ministry of Agriculture of the Republic of Azerbaijan Scientific Research Institute of Fruit and Tea Growing, Baku, Azerbaijan²Baku State University, Baku, Azerbaijan

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The research paper mentions olive leaf spot [Spilocaea oleagina (Cast.) Hughes, Syn: Cycloconium oleaginum Cast], as well as olive moth (Prays olea Bern.), olive psyllid (Euphlyllura olivina Costa.) pests that are widespread in the olive plant and their control measures. The experiments were carried out on the territory of the Absheron Experimental Station of the Scientific Research Institute of Fruit and Tea Growing on Azerbaijani olive, Pikvales, Agbaba, Jigrina varieties. As a result, it was determined that although olive leaf spot disease infection was observed in all 4 varieties, the degree of infection was different according to the varieties. Thus, against the disease, the Azerbaijani olive variety is the most unstable variety, with 23.5% in 4-point infection, and the Jigrina variety (12%) is more resistant. 16.5% infection was observed in Agbaba variety and 15% in Pikvales variety. The degree of pest infestation of the varieties was also evaluated with a point and a resistant variety was selected. It was determined that Jigrina variety (1 point) is more resistant to pests. The degree of durability of other varieties was relatively low and was evaluated with 2-3 points. From this point of view, it is more appropriate to cultivate the Jigrina variety more widely and use on the farm. Chemical and agrotechnical measures against diseases and pests found in varieties have been developed.

Keywords: Absheron, pathogen, infection, variety, degree of resistance

INTRODUCTION

Olive (*Olea L.*) is a widely used fruit plant of industrial and economic importance. Although this plant can be grown in many regions of Azerbaijan, the main fertile soil and climatic conditions for olives are found in Absheron. For the normal development of plants, especially to improve the productivity of fruit plants and quality of products, it is important to protect them from diseases and pests. Because diseases and pests damage not only fruits and leaves, but the entire plant and in some cases even destroy it. Taking all this into account, it should be noted that the subject under study is very relevant [8, 10].

Diseases and pests of the olive plant have been studied by some local and world scientists. J.Mammadov determined that 30-40% of the leaves fall off in trees infected with olive leaf spot disease [2]. G. Ismayilova has learned that if the number of nymphs on the inflorescence of the plant infected with olive psyllid pest is more than 20, then the yield loss is up to 60% [1]. S.Mammadova and B.Khalilov noted that adult olive psyllid overwinters in tree trunks, under bark, leaves and hollows [4]. D.Bayraktar and others studied the development of the fungicide in *in vitro* and *in vivo* conditions [8]. N.P.Lishkhina determined that the amount of organic and plastic substances formed as a result of the disruption of photosynthesis in leaves infected with olive leaf spot disease decreases and the plant weakens [3]. D. Mack et al. investigated olive leaf spot disease in New Zealand [9].



The purpose of the research was to study the pests found in olive varieties grown in the collection area of the Absheron Experimental Station of the Scientific Research Institute of Fruit and Tea Growing.

MATERIAL AND METHODS

The object of the research is Azerbaijani olive, Agbaba, Jigrina, Pikvales olive varieties cultivated in the collection area of Absheron Research Experimental Station and the diseases and pests detected on these varieties. 200 leaf samples were taken from at least 25 newly formed shoots (the shoots developed after the first application) obtained from all four sides of the tree for foliar disease estimation and assessment. The value of the scale obtained as a result of counting the disease was calculated by the Towsend-Heuberger method. Abbott's method also calculated the percentage of drug effects. The calculation method with the Towsend-Heuberger formula [disease severity %= $[\sum(\text{scale value} \times \text{number of plants in scale value}) / (\text{total number of plants} \times \text{highest quantity value})] \times 100$] was applied [10].

Visual observations on leaves, flowers and fruits were carried out throughout the year in order to determine the degree of infestation with common pests in different phenological periods of plants in gardens. For this purpose, pheromone traps were set up in different trees in the garden. The infection of fruits collected from each tree was recorded as a percentage. The degree of infection of 1 kg of damaged fruits was determined [5, 6].

The distribution area of pests in the region was determined by the method of N.Y.Polyakov [7]. Since the height of the plants in the field and the size of the umbel are of different sizes, the number of pests was counted not per tree, but per several sample trees, and the pests on 1m² plant surface consisting of leaves, shoots and branches were counted and the density was evaluated.

RESULTS AND DISCUSSION

Olive leaf spot disease in olives is usually more common in spring and autumn, when the weather is humid. Olive leaf spot is caused by the fungus *Spilocaea oleaginea*. The disease is first observed by the formation of dark brown bordered spots on the leaves (Figure 1). The leaves in which the disease was observed turned yellow and fell prematurely, and in the years when the disease was more widespread, drying of young shoots and branches was also observed. No diseases were observed in 47 out of 200 leaves collected from 25 shoots of Azerbaijani olive. 1 or 2 spots less than 1/2 cm in size were found on 30 leaves, and 3 or 4 spots less than 1/2 cm in size were observed on 18 leaves. In 58 of the remaining leaves, 1 or 2 spots larger than 1/2 cm in size or many small spots were determined, and in 47 leaves, more than 2 spots larger than 1/2 cm in size or many small spots were determined. In Agbaba variety olive trees, 36 out of 200 leaves had a level of damage of 0, the remaining 54 leaves had a level of damage of 1, 23 of the leaves had a level of damage of 2 and 54 leaves had a level of damage of 3, and the remaining 33 leaves had a level of damage of 4. In the Jigrina variety, 44 of the leaves obtained by the same procedure had a disease degree of 0, and the remaining 47 olives had a damage degree of 1. Of the remaining leaves, 28 had a level of damage of 2, the remaining 57 - 3, and 24 - 4. The most infection was observed in Azerbaijani olive, and the least in Jigrina variety (Table 1).

Table 1.

Evaluation of olive leaf spot disease infection in olive varieties

Name of the variety	200 leaves from 25 shoots				
Azerbaijani olive	47/0	30/1	18/2	58/3	47/4
Agbaba variety	36/0	54/1	23/2	54/3	33/4
Jigrina variety	44/0	47/1	28/2	57/3	24/4
Pikvales	33/0	57/1	20/2	60/3	30/4



Fig. 1. Olive leaf spot disease of olive plant

Pest infection rate was determined by hanging pheromone traps in the experimental area. The olive moth was observed in different numbers in different phenological periods of olive. The pest was found in the traps first at the beginning of budding and lastly during the ripening period of olive fruits. The greatest increase in the number of olive moth was observed at the beginning of flowering. Thus, there was a sharp increase in the number of pests in the traps during this period. The least pests were observed at the beginning of budding and during the period when the fruits were newly formed. With the darkening of the fruits, the increase in the number of the pest was found again. In the period of the beginning of budding, olive psyllid pest was found in the leaves and newly formed shoots, and in the period of the beginning of flowering, the infection occurred in the flowers. During full flowering, the pest was single on the leaves. In this period, the flowers are more infected (Figure 2).



Fig. 2. Olive moth (*Prays olea*) pest found in olive varieties

According to the observations, different degrees of infection were observed. In olive moth pheromone traps hung on Azerbaijani olives, the number of pests in each trap was 96 at the beginning of budding, while this number was 240 at the time of flowering. During the fruit ripening period, the number of pests in the trap was 165. In Agbaba variety, this indicator was 78 at the beginning of budding, 198 during the flowering period and 110 during the fruit ripening period. In the Jigrina variety, it was 50 during the budding period, 120 during the flowering period, and 82 during the full ripening period of the fruits (Table 2), (Figure 3). To determine the damage in fruits, fruits collected from different directions on 10 trees of each variety were visually inspected. It was observed that out of 500 olive fruits collected from different directions on Azerbaijani olive, 89, 70 of Agbaba variety, and 45 of Jigrina variety were infected (Table 3). Olive psyllid pest: 30-40 pests (3 points) were detected on 1m² of the tree in Azerbaijani olive, 15-20 (2 points) in Agbaba, and 6-8 (1 point) in Jigrina variety (Table 4).



Table 2.

Observation of the olive moth in different phenological periods (in numbers)

The name of the variety	The period of start of budding	Flowering period	Fruit ripening period
Azerbaijan olive variety	96 pieces	240 pieces	165 pieces
Agbaba variety	78 pieces	198 pieces	110 pieces
Jigrina variety	50 pieces	120 pieces	82 pieces



Fig. 3. Olive psyllid pest (*Euphyllura olivina*) found in olive varieties

Table 3.

Determination of damage in fruits

The name of the variety	500 pieces of fruit
Azerbaijan olive variety	89 pieces
Agbaba variety	70 pieces
Jigrina variety	45 pieces

Table 4.

The infection number of olive psyllid in points

The name of the variety	On the surface of 1m ²	Evaluation in points
Azerbaijan olive variety	30-40 pieces	3
Agbaba variety	15-20 pieces	2
Jigrina variety	6-8 pieces	1



In order to fight the disease, as a preventive measure, fallen leaves and fruits should be collected and burned in autumn, and pruning should be done. Agrotechnical rules such as watering and fertilizing should be monitored, and the use of nitrogen fertilizers should be stopped in gardens where diseases are spread. In soils with poor permeability, excess water should be removed by installing drainage. Spraying with a 1.5% solution of Bordeaux preparation has a good effect in chemical control. Drugs containing fungicides such as Topas, MZ-72 and others can be used. Spraying should be done in early spring and before the flower buds begin to swell.

The use of drugs containing Deltamethrin against the olive moth is quite effective. Spraying against the pest is not recommended during the flowering period. However, if at the beginning of the season more than 10% of the pest is observed on the leaves and fresh shoots, spraying is carried out 7-10 days after the period when the pest butterflies appear in the flowers. If live eggs and caterpillars are observed again during the formation of fresh fruits, spraying should be carried out. Control measures against olive moth should be carried out during March, April and May. If the orchards have been pre-sprinkled against the olive moth, then there is no need for additional sprinkling against the pest. However, if the pest spreads excessively in gardens, then Lambda-cyhalothrin insecticide of 50 g/l should be used in addition.

CONCLUSION

The Azerbaijani olive variety was the most resistant against olive leaf spot disease, it was evaluated with 23.5% in 4-point infection. 16.5% infection was observed in Agbaba variety, 15% in Pikvales variety, and 12% in Jigrina variety. When comparing the taken olive varieties, it was observed that the Jigrina variety is the most resistant variety to pests.

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ZEYTUN (*OLEA L.*) BİTKİSİNİN XƏSTƏLİK VƏ ZƏRƏRVERİCİLƏRİ

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Tədqiqat işində zeytun bitkisinin geniş yayılmış həlqəvi xallanma xəstəliyi [*Spilocaea oleagina* (Cast.) Hughes, Syn: *Cycloconium oleaginum* Cast], həmçinin Zeytun güvəsi (*Prays olea* Bern.), Zeytun ballıcası (*Euphyllura olivina* Costa.) zərərvericiləri və onlara qarşı aparılan mübarizə tədbirlərindən bəhs edilir. Təcrübələr Meyvəçilik və Çayçılıq Elmi Tədqiqat İnstitutunun Abşeron Təcrübə Stansiyasının ərazisində Azərbaycan zeytunu, Pikvales, Ağbaba, Jıqrina sortları üzərində aparılmışdır. Nəticədə müəyyən olunmuşdur ki, hər 4 sortda həlqəvi xallanma xəstəliyinə yoluxma müşahidə edilsə də, sortlara görə yoluxma dərəcəsi fərqli olmuşdur. Belə ki, xəstəliyə qarşı Azərbaycan zeytunu sortu ən davamsız, 4 ballıq yoluxmada 23,5%-lə, Jıqrina sortu (12%) daha davamlıdır. Ağbaba sortunda 16,5%, Pikvales sortunda 15% yoluxma müşahidə edilmişdir. Sortların zərərvericilərə yoluxma dərəcəsi də balla qiymətləndirilmiş və davamlı sort seçilmişdir. Müəyyən olunmuşdur ki, Jıqrina sortu (1 bal) zərərvericilərə qarşı daha davamlıdır. Digər sortların davamlılıq dərəcəsi isə nisbətən aşağı olmuş və 2-3 balla qiymətləndirilmişdir. Bu baxımdan Jıqrina sortunun daha geniş şəkildə becərilərək təsərrüfatda istifadəsi daha məqsədəuyğundur. Sortlarda rast gəlinən xəstəlik və zərərvericilərə qarşı kimyəvi və aqrotexniki tədbirlər işlənib hazırlanmışdır.

Açar sözlər: *Abşeron, patogen, yoluxma, sort, davamlılıq dərəcəsi.*

БОЛЕЗНИ И ВРЕДИТЕЛИ ОЛИВКИ (*OLEA L.*)

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В научной статье упоминается пятнистость листьев оливы (*Spilocaea oleagina* (Cast.) Hughes, Syn: *Cycloconium oleaginum* Cast), а также оливковая моль (*Prays olea* Bern.), листовертка оливковая (*Euphyllura olivina* Costa.), широко распространенные на оливе вредители. растений и меры борьбы с ними. Эксперименты проводились на территории Апшеронской опытной станции НИИ плодоводства и чаеводства на сортах азербайджанской маслины, Пиквалес, Агбаба, Джигрина. В результате было установлено, что хотя заражение пятнистостью листьев оливы наблюдалось у всех 4 сортов, степень заражения была различной в зависимости от сорта. Так, по отношению к заболеванию наиболее неустойчивым сортом является азербайджанский сорт оливы с 23,5% при 4-балльной инфекции, а более устойчивым является сорт Джигрина (12%). Заражение отмечено у сорта Агбаба в 16,5%, у сорта Пиквалес - в 15%. Также балльно оценивали степень пораженности сортов вредителями и отбирали устойчивый сорт. Установлено, что сорт Джигрина (1 балл) более устойчив к вредителям. Степень долговечности остальных сортов была сравнительно низкой и оценивалась в 2-3 балла. С этой точки зрения сорт Джигрина целесообразнее шире культивировать и использовать в хозяйстве. Разработаны химические и агротехнические меры борьбы с болезнями и вредителями сортов.

Ключевые слова: *Абшерон, возбудитель, инфекция, сорт, степень устойчивости.*