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# RESEARCH AND CONTROL MEASURES OF POWDERY MILDEW (OIDIUM) DISEASES IN VINE FRUIT PRODUCTION

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**Abstract**
The geographical location and soil-climatic conditions of the republic are very favorable for the development of all types of agriculture. It is estimated that 35% of the world's crop is lost each year, 14% of which is due to pests and diseases, while 20% of the crop is transported and stored dies during. In our country, various pests and diseases can damage agricultural crops. Pests such as apples, spider mites, grape mites, and aphids are particularly harmful, as are dew, rust, and other diseases.

**Keywords**: Fruit, oidium, diphenoconazole, krezoksim-methyl, penconazole, tebuconazole, propiconazole, ampact, impact, fungicide.

## Introduction

Vine oidium or powdery mildew disease came to Europe from America together with seedlings. Oidium was first discovered in 1843 by a gardener named Tucker in Marchet, England, located on the banks of the River Thames. In 1947, English botanist Bernimi was the first to describe the fungus that causes oidium and named it Uncinula necator tuck [1-14].

In 1847, the disease was observed in France, in the north of Spain, in 1850 in other parts of Spain, and in 1851 in vineyards in Italy. Oidium was first discovered in Russia in 1848 in the Caucasus, and in 1852 in Bessarabia. In 1858 in Crimea, and in 1865 in all vineyards located around the Black Sea, oidium disease was detected.

Studies on the distribution and damage of oidium disease in vineyards showed that the leaves of black currant variety with oidium disease from 25.0% to 35.0%, branches from 10. % to 15.0%, grape heads from 16.0% Up to 27% of cases were observed. The development of the disease was in leaves from 4.5% to 14.2%, branches from 2.6% to 4.3%, grape heads from 3.9% to 12.8% [2-13].

In Central Asia, oidium is considered one of the first-level diseases especially the Black currant, Husayni, Chillaki varieties are strongly affected by this disease.

According to his data, damage to leaves of vine varieties is 40-60%, stem damage is 32-38%, and fruit damage is 90-100%. Grape yield can be lost up to 61-78% due to this disease [4-17].

In Uzbekistan, oidium is the most serious, widespread and harmful disease of grapes. All green parts of the vine - leaves, leaf bands, green stems, flowers, buds, buds, grapes and grape heads

are affected. The fungus enters the cells of the epidermis only with its haustoria and feeds by absorbing nutrients from them. When the leaf is infected, an inconspicuous powder appears on its upper side, first white, then greyish, sparse, fine hyphae, similar to flour or dust, later on the underside of the leaf, moves to leaf bands and branches [3-8].

Later, small, dry, brown, scattered necrotic spots appear on the leaf, which coalesce to form a net-like pattern, which is a diagnostic feature of the leaf's living, green clearly stands out in the background. Dust is made up of mycelium, conidiophores and conidia of the fungus. The young leaves that are being written are curled and shriveled. Leaf bands become brittle and break easily [5-15].

The bud of the inflorescence is damaged before or after flowering, the yield of grapes is reduced, the yield is reduced, or often the inflorescence completely dries up (Fig. 2). Grapes can be damaged up to 8% sugar content. Early infected grapes wither and hang on the vine until the end of the season. Later, the infected grapes shrivel and crack to the core, rotting under the influence of saprotrophic or semi-parasitic fungi. On the fruits of some varieties, net-like spots develop. Grapes of red or black varieties lose their marketability, and the wine made from them has an unpleasant taste. This serious disease reduces the grape harvest in Uzbekistan by 50%, and in some seasons it causes 100% loss [6-18].

Cultivated vine species (Vitis vinifera, etc.) and other species belonging to the Vitaceae family are affected by oidium. Varieties of grapes with colored and sour fruits are less affected. Soyaki and Nimrang uskat varieties have shown high tolerance to oidium in the conditions of Uzbekistan. The causative ascomycete fungus Uncinula necator, anamorph Oidium tuckeri, is an obligate parasite. The hyphae are located on the affected organs and stick to them with the help of appressoria, which are composed of scales. From the appressoria, infectious hyphae grow, they penetrate into the cuticle and then into the epidermis, where haustoria appear [7-11].

Ascospores are oval or ellipsoidal, yellowish or often colorless, 15-25x10-14 µm. Ascospores also grow by forming several outgrowths, appressoria and haustoria. The ascomycete stage has little or no significance in the overwintering of the fungus and the development of the disease. The development and spread of the disease takes place mainly in the conidial stage. Anamorph stage. Conidiophores are 10-400 µm long. Conidia are colorless, cylindrical-oval or ellipsoidal, 27-47x10-21 µm, in chains of 3-5 [9-10].

At the time of budding or a little earlier, when the average air temperature reaches 10-11 ℃, it begins to grow and surrounds the growing young branch and the leaves with a white mycelium, on which it forms many conidia, and they is the primary source of disease and infects other parts of the vine and other vines [9-16]. These branches, which are the primary spreaders of the disease, are called "flag branches". Oidium gives several generations in one season. Oidium appears early in the spring, but it develops rapidly before the vine blooms, and this development continues until the weather becomes very warm and the humidity decreases [12-19].

The disease is heat-loving, and temperature plays a key role in its development, conidia grow at 6-32 ℃, the optimum temperature is 18-25 ℃ and damage the vine; Conidia stop growing at 35 ℃, conidia and exogenous mycelium die when it exceeds 40 ℃. It takes 4-6 days from vine damage to the appearance of conidia at a temperature of 23-30 ℃, and 32 days at 7 ℃. At

a temperature of 36 ℃the mycelium dies in 10 hours, and at 39 ℃ in 6 hours. At an average daily temperature of 19-20
°C, the disease develops and spreads very quickly, and at a temperature of 24-25°C, the speed of these processes decreases significantly and stops at 40 ℃. Free moisture (rain, dew) has a negative effect on the growth of conidia, for this a relative humidity of 20-100% (optimum 50-80%) is sufficient [12].

**Experimental Part**

The first symptoms of the disease appear in spring (May), when the air temperature is 20-25 ℃, humidity is 60-80%. In summer, the disease can develop if the humidity is higher than 25% for the development of the fungus. Leaves, young branches and fruits of the vine are infected with powdery mildew. Severely affected leaves become stunted and dry. It looks like ash is sprinkled on the surface of a leaf. You can't feel the powder on the fruits, but the second symptom of the disease is cracking and the fruits begin to rot. The fungus overwinters in buds and plant debris. In some years, it damages the yield of grapes by 60-70%.

**The following measures are taken to combat this disease**

High-quality tillage of the soil, moderate irrigation, watering; fertilizing with phosphorus and potassium fertilizers.

When the chemical method was used, the following chemicals were used according to the permit of the State Chemical Commission:

Difenoconazole-based (25% em.c. - per 0.2 liters);

Kresoxim-methyl base (50% s.d.g. - per 0.2 liter);

Penconazole-based (10% e.v. - per 0.3 liters);

Based on Tebuconazole+ Triadimefon (22.5% em.c. - per 0.15-0.25 liters); Propiconazole + Tebuconazole (40% of the total body weight - per 0.3 liters)

When studying the biological and economic effectiveness of these drugs, it was found that the results gave positive indicators. Such control measures were carried out in full compliance with environmental protection and food safety requirements.

**Experimental Results**

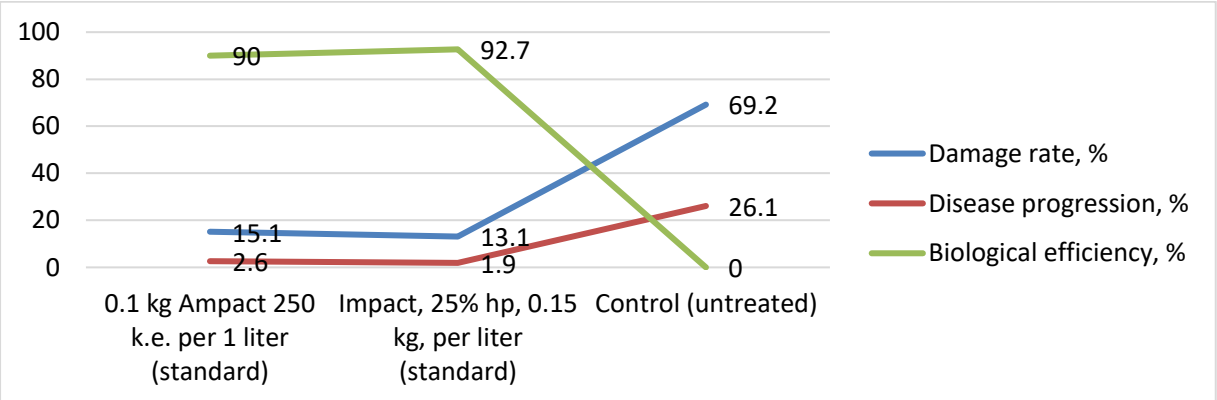


Fig.1. Biological effectiveness of Ampakt and Impakt fungicides against oidium diseases on vine leaves

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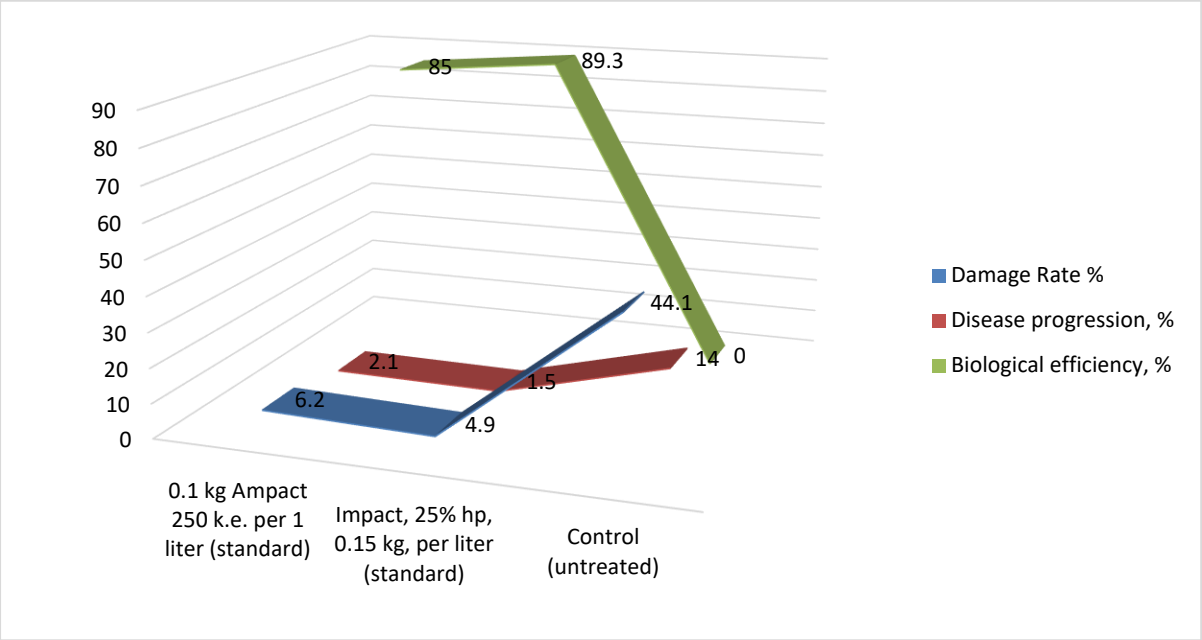


Fig. 2. Biological effectiveness of Ampakt and Impakt fungicides against oidium diseases on vine branches

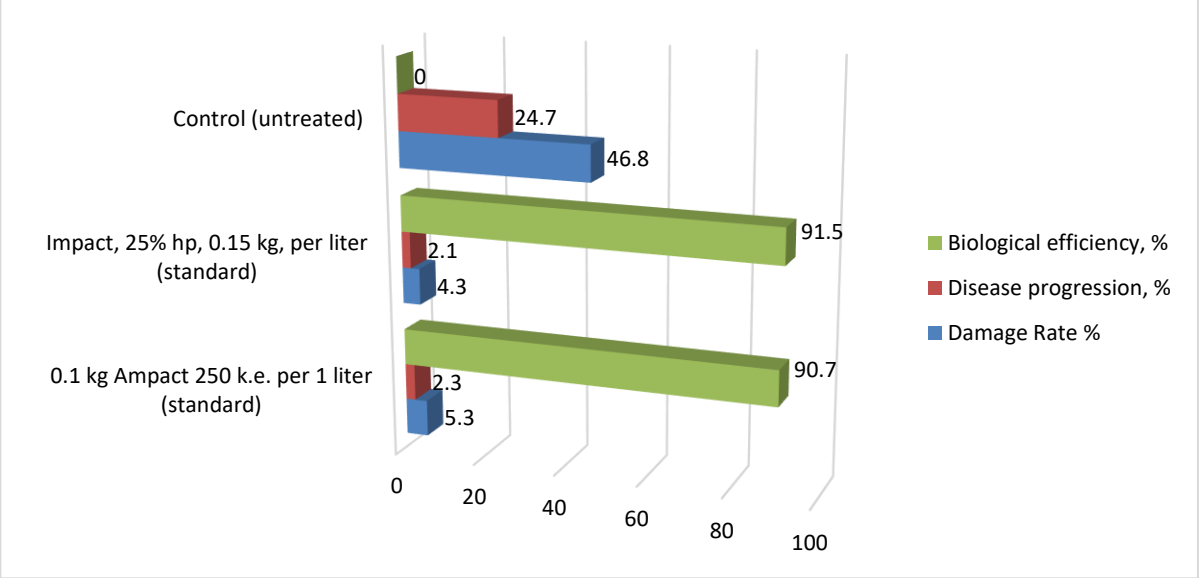


Fig. 3. Biological effectiveness of Ampakt and Impact fungicides against oidium diseases on vine fruits

## Conclusion

We also studied the effects of Insegar, Karate, Ampakt drugs on grape fruit, and we paid attention to the organoleptic indicators of grapes from the point of view of food safety, i.e. taste, star, and taste. The state standards of the fruit for export were obtained. According to the received data, the above-mentioned preparations showed positive and high efficiency in the set norms and did not have a negative effect on the quality of grapes.

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