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METHODS FOR INCREASING GRAPEVINE DISEASE RESISTANCE USING THE EXAMPLE OF THE FERGANA VALLEY

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Abstract; This article reviews the main diseases of viticulture in the Fergana Valley and methods for combating them, as well as methods for increasing the genetic resistance of grapevines to diseases. The article analyzes the importance of agrotechnical measures, biological and chemical protection methods , and the selection of disease-resistant varieties in preventing diseases. Taking into account the climatic conditions and soil characteristics of the Fergana Valley , practical recommendations are given to increase grape yield and improve its quality.

Keywords : Viticulture , diseases, tolerance, Fergana Valley, agrotechnics, biological protection, chemical protection, variety selection, vine, mildew, oidium, anthracnose, bacterial cancer, gray rot.

Introduction; Grapes are one of the important branches of Uzbekistan's agriculture, and the Fergana Valley in particular has favorable climatic and soil conditions for grape growing. The valley's sunny days and temperate climate ensure that grapes are juicy and of high quality. However, diseases are a serious obstacle to obtaining high and high-quality yields in viticulture. Diseases not only reduce the yield, but also negatively affect its quality, and sometimes lead to the death of the entire crop. Therefore, increasing the resistance of grapevines to diseases and effectively combating them is an urgent task. These measures not only increase economic efficiency, but also serve to protect the environment.

Main part

1. Main diseases of grapes in the Fergana Valley and their development conditions

In the conditions of the Fergana Valley, the following diseases are mainly common in grapes, each of which has its own specific development conditions:

- Mildew (Plasmopara viticola): This disease is one of the most dangerous diseases, developing rapidly, especially in humid and cool weather conditions . It spreads rapidly in spring and early summer, when the air temperature is 12−25°C and there is constant humidity. It causes serious damage to leaves, branches and grape heads. Yellow-green spots appear on the leaves, and later brown necrosis. White powder is observed under the leaves.
- Oidium (powdery mildew, Erysiphe necator): On the contrary, this disease spreads especially quickly in hot and dry weather . Optimal conditions are created when the air temperature is 20−30°C and the humidity is low. It forms a gray-white powder on the tops of the grapes and young shoots, which interferes with the photosynthesis process of the plant and leads to cracking of the fruits.
- Anthracnose (Elsinoe ampelina): Causes red-brown spots with reddish edges on leaves and branches, and deep cracks on fruits. This disease also becomes active in humid and warm weather , especially after spring rains. The affected areas become necrotic, leading to the death of plant parts.

- Bacterial canker (Agrobacterium vitis): Causes the formation of growths (corns) on the vine, especially on the root collar and trunk . This disrupts the plant's nutrition and eventually causes it to wither. It is often transmitted through mechanical damage and can persist in the soil for a long time.
- Gray rot (Botrytis cinerea): Severely damages the crop, especially in conditions of high humidity and air temperatures of 15−25°C . Gray powder and rot are observed on ripe grape heads. This disease also sharply reduces the shelf life of grapes.

2. Agrotechnical methods of combating diseases

Correct agrotechnical measures are of great importance in preventing diseases , as they increase the overall immunity of plants and create unfavorable conditions for the development of pathogens:

- Proper soil management: Regular cultivation and weeding of vineyards reduces the transfer of pathogens (especially mildew spores) from soil to plant. Turning over the vines in the fall helps to eliminate overwintering pests and pathogens.
- Ventilation and pruning of vineyards: Good ventilation is ensured by not planting vines too thickly, forming the branches correctly, and removing excess branches. This reduces the moisture on the surface of the leaves and fruits, preventing the development of diseases such as mildew and gray rot. Regular removal of damaged and diseased branches, their removal from the vineyard, and burning will eliminate the source of infection.
- Nutrition: Providing a balanced nutrition for the vine , especially with potassium and phosphorus fertilizers, increases the plant's immunity to diseases. It is important to use nitrogen in moderation, as its excess can lead to excessive sugariness of the plants and an increased susceptibility to diseases. Microelements (boron, zinc, manganese) also increase the plant's resistance to stress.
- Irrigation regime: It is important to follow a correct and regular irrigation regime. It is recommended to water in the morning or evening, as watering during the day can increase humidity and create conditions for the development of diseases. Drip irrigation systems prevent water from getting on the leaves, reducing the spread of diseases.

3. Chemical and biological protection methods

It is advisable to combine chemical and biological methods within the framework of an integrated protection system :

- Chemical protection: The use of fungicides is effective in preventing and controlling the occurrence of diseases . The appropriate preparations are used depending on the type of disease:
- Against Mildew: Copper-based preparations (Bordeaux liquid, copper chloroxide) or systemic fungicides (Ridomil Gold, Previkur Energy).
- Against oidium: Sulfur-based preparations (colloidal sulfur), topaz, karatane.
- Complex fungicides: Some preparations are effective against several diseases at the same time. When using the preparations, it is necessary to strictly follow the instructions, take into account the protection periods (the last treatment period before harvesting) and determine the number of treatments depending on the degree of damage.
- Biological control: Biological methods allow you to combat diseases without harming the environment. This can be done by using beneficial microorganisms (e.g., Trichoderma fungus,

Bacillus subtilis bacteria) or plant extracts (e.g., garlic, onion, hot pepper extracts). These agents suppress the development of disease pathogens or fight them. Biological preparations are especially effective in the early stages of the disease and for preventive purposes.

4. Choosing disease-resistant varieties

One of the most effective methods is to plant genetically resistant varieties to diseases . Selecting resistant varieties, both local and introduced, suitable for the conditions of the Fergana Valley will help increase yields and reduce chemical treatments. Such varieties are recommended by local research institutes, for example, the Research Institute of Horticulture, Viticulture and Winemaking under the Scientific and Production Center of Agriculture of the Republic of Uzbekistan. Some resistant varieties:

- "Kishmish Sultani" - has high resistance to mildew and oidium.
- "Rizamat" is relatively resistant, but requires optimal agrotechnical conditions.
- "Toyfi" is moderately resistant to diseases.
- New selection varieties, such as "Sharq", are also being tested.

Conclusion

Increasing the resistance of grapevines to diseases is one of the main conditions for obtaining high and stable yields in the Fergana Valley viticulture. In this regard, the correct implementation of agrotechnical measures , the combination of biological and chemical protection methods , and the planting of disease-resistant varieties are important. By introducing an integrated protection system (IPM) in the fight against diseases, there are opportunities to significantly increase grape yields, improve product quality, and grow environmentally friendly grapes. In the future, it is an urgent task to strengthen selection work and work on creating new, highly resistant varieties using genetic engineering methods.

References;

1. Isayev B.I., Isayev S.B. Uzumchilik. – Toshkent: Fan va texnologiya, 2018.
2. Qurbonov G.A., Mirzayev M.R. Uzum kasalliklari va zararkunandalari. – Samarqand: Fan, 2019.
3. O‘zbekiston Respublikasi Qishloq xo‘jaligi vazirligi tavsiyalari. Uzum yetishtirish bo‘yicha tavsiyalar. – Toshkent, 2022.
4. Agro-Olam jurnali, turli sonlar. Uzumchilikda innovatsion texnologiyalar.
5. Xalqaro uzumchilik konferensiyalari materiallari.
6. Respublikada tok kasalliklari, zararkunandalari va ularga qarshi kurashish chora-tadbirlari. O‘zbekiston Respublikasi Vazirlar Mahkamasi huzuridagi Agrosanoat majmui ustidan nazorat qilish inspeksiyasi, 2023.