American Journal of Botany and Bioengineering
https://biojournals.us/index.php/AJBP
ISSN: 2997-9331

Cucumber Varieties Are Affected by the Soil Pathogen Fusarium Spp. Tolerance

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Received: 2024 19, Dec
Accepted: 2025 28, Jan
Published: 2025 06, Feb

Annotation: Navruz, followed by Zilol varieties, are the most resistant to fusarium wilt disease, and on the contrary, Ezgu, then Shirin hybrids are the most resistant to the disease.

Keywords: cucumber, variety, plant, fusarium, verticillium, pathogen, wilt, tolerance.

Introduction. Wilt, that is, blight disease is found in all people of the world. Wilt disease is caused by two types of soil pathogens.

Verticillium wilt - its causative agent is Verticillum dahliae Klebahn, which was first cultivated by H. Klebahn in 1913 from the potato flower (dahlia) plant in a clean environment and recorded as a new species in science.

In Uzbekistan, N.G. Zaprometov - the founder of the science of phytopathology - in his article in 1916 gave preliminary information about cotton wilt disease (N.S. Mirpulatova, 1973).

According to V.V. Fillipov, L.N. Andreev, N.V. Bazilinskaya (1978), more than 660 cultivated and wild species of fungi belonging to the genus Verticillium damage plants. In the conditions of

Uzbekistan, Verticillium dahliae Klebahn, the causative agent of verticillium wilt disease, mainly infects Gossipium hirsutum L. varieties of medium fiber cotton.

Fusarium wilt is caused by Fusarium oxysporum f. sp. vasinfectum (Atk.) Snyder et. Hansen and Fusarium verticillioides (Sacc.) Nirenberg are fungi.

I. Barbari n (1912), for the first time, isolated the fungus Fusarium vasinfectum from wilt-infected plants brought from Central Asia (N.S. Mirpulatova, 1973). These fungi are widespread in nature, they infect about 1,000 cultivated and wild species of plants during the growing season, and during the storage of the crop, they cause great damage to its quality (Sidorova, 1983).

In addition to cotton, these fungi cause the wilting of tomatoes, cucumbers, melons, watermelons, peppers, potatoes, eggplants, zucchini, fruit, and other trees.

In recent years, fusarium wilt has been observed in plants planted on lands freed from cotton.

Wilt fungi are soil pathogens that infect plants through the roots.

The growth of pathogenic fungi in the soil and their penetration into plant roots largely depends on the fungistatic potential of the soil (Lockwood, 1964; Mishustin, 1972; Marupov 1975; 1993; Voznyakovskaya, 1983; Voznyakovskaya, Trufanova, 1988).

R.M. Jackson (1957) and A. In the research of Marupov (1992), cellovan disk and membrane chambers containing microsclerotia of V. dahliae were placed in sterilized and unsterilized soil, and the pathogen was observed to grow only in sterilized soil free of saprophytic microorganisms.

In sterilized soil where the saprophytic microflora is lost and propagules of the pathogenic fungus are introduced, the pathogen develops normally and infects the plant, the infected plant dies.

The most radical means of combating wilt diseases is the creation of resistant varieties. However, the gradual increase in wilt disease in new varieties from year to year makes it necessary to change varieties more often. Therefore, it is a continuing problem to create disease-resistant varieties.

According to Academician S.S. Sodikov and S.M. Mirakhedov (1962), the resistance of cotton varieties to wilt is a hereditary characteristic, to one degree or another, it is characteristic of each variety and depends on its genetic characteristics.

Also, the resistance of plants to wilt disease is inextricably linked with the virulence of the causative fungus, its species and its amount in the soil (Mirpulatova, 1973; Marupov, 1975; 2003).

Adaptation of the pathogen population to a new species indicates its narrow specialization in parasitic feeding, but the internal content of this process has not yet been fully elucidated. Specialization of the pathogen to new varieties leads to the emergence of new forms, physiological races and biotypes of wilt pathogens within the species (Sidorova, 1983; Guseva, 1988).

Research methodology. The research was conducted based on the methodology of A. Marupov (2024). Pure sand was taken and passed through a sieve (sieve) with a size of 0.25 μm. Then 2 kg of sifted sand was taken out and washed 3 times in ordinary household (water supply) running water. It is dried at room temperature, then dried in a dryer at a temperature of 100 C0 for 1 hour. Then to clean the sand from microorganisms, autoclave it for 1 hour at 1.5 atm. pressure sterilized. After 24 hours, it was sterilized again as above to remove the remaining active thermophilic microorganisms. Then 1 kg of sterilized sand is filled in each piece of special containers (tubs) 4 cm high, 30 cm long, and 15 cm wide.

Figure 1. View of bathtubs.

Before sand inoculation, the density of the fungus suspension was determined using the following formula using the method of Benken A.A., Khokhryakov M.K., Malinin V.M., (1974) in the Goryaev chamber.

Determined by the formula Ps = A x 250000. Ps is the average infection number in 1 cm3 suspension, A is the average number of spores in a large square.

Then Fusarium sp. was added to the sand in each tub. 10 ml of suspension of biomaterials of the fungus with a titer of 5x105. inoculated from The seeds of Navruz, Zilol varieties and Shirin, Ezgu hybrids of cucumber were sown 20 pieces in each tub to a depth of 1.5-2 cm. Then sterilized water was poured into the bathtubs through the iron troughs installed in the middle so that the sand did not reach the surface.

Seed germination energy and germination were determined for 2-5 days. Symptoms of the disease of the disease level of plants

in the dynamics, from the date of planting, every day for 10 days, and every 5 days in between, it was monitored and recorded.

Research results. Table 1 shows the level of growth energy and fertility of cucumber Navruz, Zilol varieties and Shirin, Ezgu hybrids against the background of fusarium wilt from poly crops. As can be seen from the research results in the table, it was observed that 15 seeds germinated when the growth energy of Novruz cucumber variety was monitored on October 7. It was observed that 16 and 19 seeds of Zilol and Ezgu varieties, and 1 seed of Shirin variety were struck.

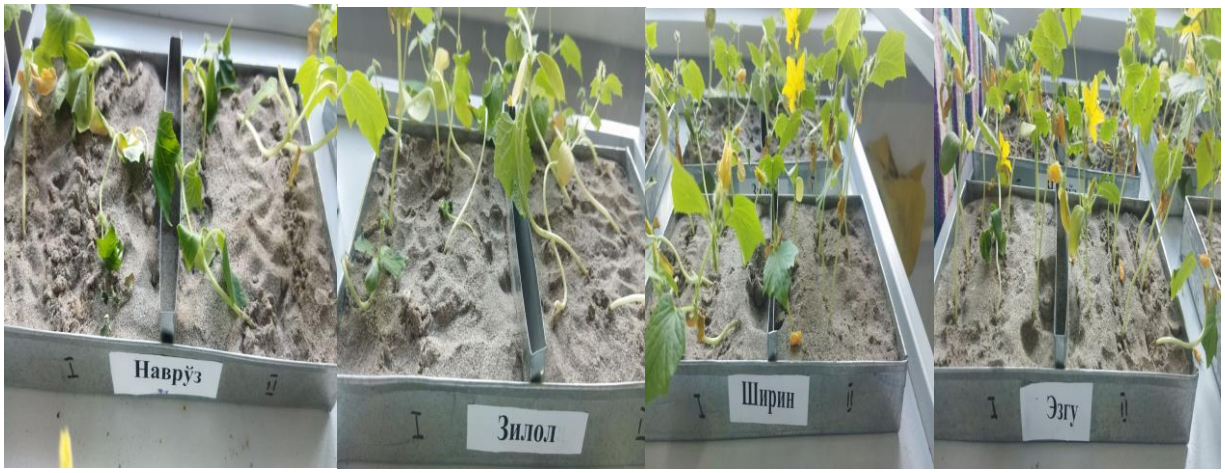

Figure 2. Cucumber plant infected with fusarium wilt.

It can be seen that Ezgu is the variety with the best growth energy and Shirin is the lowest variety. Seed germination was observed on October 10. The number of sprouted plants was Navruz - 15, Zilal - 18, Ezgu - 19 and Shirin - 17. 1 piece due to illness for the first time the loss of vigor was observed in Navruz variety on October 15, 2 seedlings on October 20, 1 on October 25, and 4 on October 30. In total, 8 seedlings were observed on November 26. The first loss of strength in the Zilol variety was observed on October 20, that is, 5 days later than in the Nowruz variety. In Shirin and Ezgu hybrids, this indicator was the lowest on October 30, 1-2 pieces.

As mentioned above (Sadikov, Mirakhmedov, 1962), resistance of cotton varieties to wilt is a hereditary trait, and it is known that it is specific to each variety and depends on its genetic characteristics. Based on this scientific opinion, one of the important factors is to pay attention to their genetic creation when studying the resistance of each type of plant varieties to wilt disease.

In this context, we have identified cucumber cultivars with wilt pathogen Fusarium sp. We conducted studies to determine the tolerance to, the results of the studies are presented in Table 2. As can be seen from the table, the wilt disease of cucumber varieties directly depends on the quality of the seeds. In Navruz variety, which has the lowest fertility, symptoms of wilt disease were observed first, only 10 days after seed germination in 6.6%.

After that, 5.5% of disease symptoms were observed in Zilol variety after 15 days. In hybrid Ezgu and Shirin varieties, disease symptoms were recorded in 10.5 and 5.8% after 25 days.

On November 26, i.e. 50 days after the germination of seeds, the degree of wilt disease in plants was 100% in Navruz and Zilal varieties. It was observed that the infected plants of Navruz variety completely withered after 50 days. Wilt hybrid Ezgu and Shirin varieties infection rate was 68.4 and 82.3%, and flowering and fruiting of all plants were observed.

Conclusion. Thus, it was determined that Navruz, then Zilol varieties are the most resistant to fusarium wilt disease, and on the contrary, Ezgu, then Shirin hybrids are the most resistant to the disease. The results obtained from the experiment showed once again that the genetic background of varieties is important in their resistance to wilt disease.

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