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SEED AND PLANT ROT DISEASE OF SWEET AND HOT PEPPER IN UZBEKISTAN AND MEASURES TO CONTROL IT

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Abstract. Uzbekistan is currently paying a special attention to the cultivation of sweet and hot peppers. One of the serious factors hindering the sustainable production of a high and quality crop is the seedling damping-off, a widespread pepper disease in the world. The main causal agents of this disease are pathogenic fungi *Fusarium oxysporum*, some other *Fusarium* spp., *Rhizoctonia solani* and oomycetes from the genus *Pythium*. Infection of pepper seedlings by other, rarely occurring species of fungi was reported only from some countries or their regions. This review article provides detailed information about the geographical distribution of these pathogens, the symptoms and development of the disease caused by them, and their control.

Key words: Capsicum pepper, disease, damping-off, Rhizoctonia solani, Fusarium oxysporum, Botrytis cinerea, control measures.

Introduction. Sweet and hot pepper (capsicum) species belong to the genus Capsicum L. of the order and family of Ituzumdozadas. Their homeland is the subtropical climatic regions of Mexico, Central and South America. Detailed information about the types of peppers, their properties, and the capsaicin compound they synthesize can be found in the literature (Khasanov et al., 2021; Khasanov et al., 2022; Hasanov et al., 2022).

A number of abiotic and biotic diseases occur in pepper. Biotic or infectious diseases are caused by fungi, bacteria, phytoplasmas, viruses, nematodes. According to the literature data collected by the authors, more than 130 microorganisms, including 67 fungi, 11 oomycetes, 11 bacteria, 4 phytoplasmas, 32 viruses, and more than 6 nematode species, have been reported to cause disease in pepper species and varieties in different countries. Pepper crops can also be damaged by 6 species of parasitic plants. In this article, we provide information on fungal diseases of seed pod and grass rot in pepper.

Symptoms and development of the disease. The hairs of the roots infected with the above-mentioned pathogens rot, they become hairless, the grass absorbs water and nutrients from the soil sharply, the leaves, starting from the bottom, turn yellow or not, wither and dry. The seeds are very hardy for 3-4 weeks after emerging from the soil surface. In larger plants, the disease is usually less common, most often it appears in the form of root rot after planting seedlings in the field or greenhouse.

The damage of the disease depends on the stage of plant growth: the earlier the damage starts, the higher the damage. The disease makes crops sparse and causes premature wilting of plants and reduced yields. There are no disease-resistant varieties.

Deep planting of seeds without fungicide treatment, excessive application of nitrogen fertilizers, thick lawns, poor air circulation among them, sudden changes in weather, high concentration of salts in the soil, high soil moisture, and dense grasses compressing the root neck cause the disease. strengthens its existence and development.

The structure of dicot lawns is shown in Figure 1. The main reasons for the occurrence of the disease are the unfavorable temperature, humidity and other soil

conditions for the growth and development of pepper grasses, and the presence of large amounts of propagules of pathogenic fungi in the soil (Akhatov and dr., 2013).

Rhizoctonia solani s. l. The world of real fungi (Fungi, Mycota), belongs to the phylum Basidiomycota, class Agaricomycetes, order Cantharellales (or Ceratobasidiales), suborder Rhizoctonia of the family Certaobasidiaceae. The name of the genus means "killer of roots, killer of roots" in ancient Greek, and R. solani means "killer of roots of vines".

Species of the genus Fusarium cause rot and death of germinating seeds of pepper, hypocotyl and root rot of mature grasses, lodging and dieback of grasses, root, root neck or stem rot of larger seedlings and established plants, and wilt (wilt). Reddish-brown, dry sores develop on the hypocotyls of infected lawns. Fungi that damage pepper roots and stems also cause its grass to lay down and die**.**

Species of the genus Pythium. Pythium species live as saprophytes in the soil, they are preserved for a long time in plant residues with their oospores, and they can be preserved in the soil with mycelium. Grasses are damaged when the soil moisture is high and the temperature is low (between 10 and 20oC). The optimum temperature for Pythium ultimum is 10-15oC, damage is reduced at temperatures above 15oC, lawns are not damaged at 22-24oC. P. aphanidermatum and P. myriotylum are distinguished from other Pythium species by their heat-loving nature, and the comfortable temperature for them is 25-30oC. P. aphanidermatum can also damage plants at 13-18oC, but the ideal optimum for this is 30-35oC. Pythium species are spread in the soil by their sporangia, which produce hundreds of zoospores in the presence of moisture and favorable temperature. Rooted zoospores turn into cysts, from which infectious hyphae pierce the root tissue and grow to form new hyphae, which digest and feed on the tissue with their hydrolytic enzymes. In rotten roots,

these pathogens form oospores and chlamydospores, with the help of which they overwinter and are stored for a long time in unfavorable conditions.

Botrytis cinerea. B. cinerea is most common in vining crops, especially in greenhouses, it damages sweet and hot peppers, eggplant and tomato seedlings in open and closed soil.

Infected seeds do not grow in the soil, become soft, mushy, turn brown, do not swell, and rot. Infected grass and seedling tissue develop darker, watery lesions that grow and die. The number of seedlings is reduced.

In the field, Botrytis cinerea is maintained by its mycelia and sclerotia in crop and weed residues. Sclerotia are stored freely in soil and between seeds.

Gray mold caused by B. cinerea is common in tomatoes and some other crops in Uzbekistan, it causes great damage to tomatoes in greenhouses, it can also damage pepper, but the reports that it is found in sweet pepper (Hasanov et al., 2009) are not confirmed by documents about the identification of the fungus.

Control measures against seed and grass rot. It is difficult to control the disease of pepper grass rot and dieback, because the fungi that cause this disease live in the soil, damage many types of crops and weeds, feed as saprophytes on their residues and other organic substrates, and persist in the soil for a long time with their chlamydospores or sclerotia or oospores.

It is important to apply preventive measures before planting, because the plants cannot be cured after the disease has appeared. If the disease still appears, dig up the first withered and wilted plants together with the soil under them and burn them outside the greenhouses and fields (it is strictly forbidden to put the withered plants in the soil or compost), do not let the plants get into a state of stress, water them in time, do not overwater and overwater , organic fertilizer, compost, and balanced mineral fertilizers, not to increase the standards of nitrogen fertilizers, and to

use phosphorus and especially potash fertilizers (Akhatov and dr., 2013). Installing a drip irrigation system in greenhouses and fields will reduce the incidence of turf and root diseases. In this case, so that the fertilizer salts do not injure the roots, it is necessary to install the water pipes at a distance from the pepper roots. Increasing the rate of mineral fertilizers later increases the damage of their salts to the roots (Akhatov and dr., 2013).

Gray rot is common in greenhouses. The disease is easily recognized due to the formation of fluffy, gray mold on the affected stems and inflorescences. In cases where the disease is widespread, it has been recommended to temporarily suspend foliar feeding of crops and the use of evaporative cooling systems in buildings (Akhatov, 2011).

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