

Article

Diseases in Broccoli and Their Effect on Plant Growth and Development

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Abstract: This article describes the types of diseases that occur in broccoli, their biological characteristics, symptoms of diseases in broccoli and their specific aspects, the level of study of these diseases in our country, their prevalence, and scientifically based effective measures to combat them.

Keywords: Fungal, Bacterial, Viral Diseases of Broccoli



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Introduction

Vegetable production in Uzbekistan has significantly exceeded consumer standards, and plants belonging to the Brassicaceae family play an important role in healthy nutrition [1]. Of particular interest is broccoli (*Brassica oleracea* L. var. *italic* Plenck), which is widespread in many countries but is rarely grown in Uzbekistan [2]. Broccoli in different regions and soil-climatic conditions [3]. Broccoli is superior to cauliflower in terms of its biochemical composition. It is characterized by early maturity and frost resistance, which makes it promising for repeated cultivation [4]. Tillage is one of the main measures aimed at achieving high yields. Its purpose is to: accumulate or remove excess moisture from the soil; create a deep and well-cultivated arable layer; ensure proper decomposition of organic fertilizers and plant residues; and eliminate weeds, pests, and infectious diseases [5, 6].

Material and Methods

Broccoli is susceptible to a number of fungal, bacterial, and viral diseases during cultivation. Fungal diseases of broccoli have a significant impact on the growth, development, and yield of the plant.[5] Infectious diseases caused by parasitic or semi-parasitic fungi in plants occur in the process of diseases (pathology) that cause disruption of the structure and physiological function of the entire organism or a certain part of it due to the harmful effects of fungi. Other plant to diseases relatively many widespread and are considered harmful. They plant harvest and product quality reduces. One type of plant can be affected by several dozen types of fungal diseases. Fungal diseases the most many damage causing and many widespread from diseases is considered. Some pathogen fungal spores wind, rain, insects, milk mammals, and polluted dishes, village farm machines and tools through also The fungus is a fungus. Plant flour dew (ash) and fake flour with dew when sick following see the water and nutrient-rich parts of the plant are often affected by rot. To further illustrate this point, the following table lists other common fungal diseases of broccoli and their effects on plant growth and development (Table 1):

Table 1. Main fungal diseases of broccoli

Disease name	Trigger	Main symptoms	Effect on the plant
Alternaria (Black spot)	<i>Alternaria brassicae</i>	Black-brown ring-shaped spots on leaves	It reduces photosynthesis and impairs product quality.
Pervonoz (False flour-dew)	<i>Downy mildew</i>	Yellow spots on the leaf, white powder underneath	It weakens the plant and the leaves dry out and fall off.
Kila (Root bulge)	<i>Plasmidiophora brassicae</i>	Swelling and lumps on the roots	It stops delivering water and nutrients, and the plant withers.
Fusarium wilt (Wild)	<i>Fusarium oxysporum</i>	Yellowing and curling of leaves to one side	It stops the growth of the plant and dries it out completely.

Results and Discussion

Root collar (black) rot disease (*Rhizoctonia solani*) This disease is a soil fungus that begins to infect broccoli during seedling cultivation and planting in open ground. During the germination period of broccoli sprouts, the root collar changes color, gradually begins to darken and dry out [7]. Agrotechnical measures to combat the disease: it is necessary to introduce crop rotation, as well as high-quality cultivation between rows, and not to water too much. The use of the drug Trichodermin as a biological control measure also gives very good results. As a preventive measure, 25-30 days before sowing seeds, 2.5% Maxim 0.4l / t, 31.2 % Seles Top -0.4-0.6 l / t, 50% Fundozol -2.0 kg / t of treatment is very effective. [8] Nutritional impairment [8]: Diseases affecting the root system (e.g., Wilt) block the flow of water and minerals to the stem. Loss of commodity quality: The appearance of black spots on the edible part (florets) of broccoli makes it unfit for the market [9]. Yield: In severe cases, the crop can be lost by 30-50%, sometimes completely. Prevention: *Crop rotation*: alternate with non-Cabbage crops. *Seed treatment* : Disinfect with fungicides or hot water before planting. *Humidity control*: Avoid overwatering and waterlogging [10]. Although broccoli is a self-healing crop, there are bacterial diseases that can damage it, the most common of which are: bacterial blight, black rot, green mold, and soft rot. Bacterial blight causes yellow spots on the leaves, and black rot causes yellowing of the leaves and black streaks [11]. Soft rot causes the tissues to soften and rot, making the product unfit for consumption. The main bacterial diseases of broccoli are: Bacterial blight. Small, angular, yellowish spots appear on the leaves, which later turn black and the leaves may tear. *Black rot*: V -shaped yellow spots appear starting at the leaf edges, which later turn black. Soft rot [12]. Leaves and spikes become soft and mushy with a putrid odor, and watery rot is observed. Bacterial spot. Small, black spots appear on the leaves and small holes are observed forming on the leaves. Methods of protection against bacterial diseases include: Using clean seeds, planting disease-resistant varieties, crop rotation and removal of infected plants , ensuring that fruits and vegetables are not damaged during harvesting, and using copper-based fungicides and bactericides when necessary [13]. Viral diseases of broccoli are mainly transmitted by cabbage viruses (Brassica viruses), including broccoli mosaic virus (BMV), cabbage virus Y (CVY) and some types of potyviruses, which cause leaf spots, mosaic deformation, growth retardation and yield reduction, and are mainly spread by aphids and thrips [14, 15].

Conclusion

Downy mildew is a fungal disease that affects seedlings in the early stages. The rapid development of the disease is influenced by excessive humidity and excessive watering of crops with cold water. Yellowish powdery spots appear on the leaves of diseased broccoli and cabbage. Chemical control measures - it is recommended to spray infected plants with the following fungicides: (*Mancozeb* + *Metalaxyl M*) *Ridomil gold MTS* 68% - 2.5 kg / he, (*Penconazole*) Topaz 10% ke-0.25 l / ha, Ento paz extra 10% ke-0.25 l / he, (*Propineb*) *Anthracol* 70% n.kuk-2.0 kg / ha and other fungicides. Chemically treated fields are best treated with a plant growth regulator containing humic, fulvic, gibberellin, and a complex of N, P, and K microelements for 2-3 days to relieve stress and accelerate development. Fungal

diseases have a significant negative impact on the vital processes of the plant: Decreased photosynthesis: Spots on the leaves break down chlorophyll, reducing the plant's ability to produce nutrients. Cabbage virus mosaic (CVM) causes yellow and green mosaic spots on leaves and slows plant growth. Broccoli mosaic virus (BMV) causes dark brown spots on leaves. To prevent viral diseases, planting virus-resistant varieties, controlling aphids and thrips, using clean seeds, and destroying infected plants are effective methods for preventing viral diseases.

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