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BACTERIAL DISEASE OF WALNUTS IN UZBEKISTAN CONDITIONS

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ABSTRACT

This article provides information on the most common bacterial rot diseases of walnuts and their pathogens, as well as effective measures to combat them in the Tashkent region of Uzbekistan.

KEYWORDS: *walnuts, bacterial rot, fungal diseases, monitoring diseases.*

INTRODUCTION

Scientists from around the world say there are 7 bacterial diseases in nuts and almonds. Of these, bacterial rot, which is found in all parts of the world where this tree is grown and found to be fruit ho, causes serious damage, including *Xanthomonas arboricola* pv. *juglandis* type. This bacterium has been found to infect ordinary, gray, American black walnuts, as well as Paradox and other hybrids.

This disease affects all the young tissues of walnut trees - leaves, paternal and maternal flowers, green twigs and fruits. In the damaged stems, young leaves, twigs and fruits are slightly sunken, dark brown, almost black spots and wounds, irregularly shaped spots are formed on the leaves. In young fruits, round, light brown spots appear around them, a wide, water-like ring. The spots grow with fruit growth, turning into dark, sunken wounds; wounds can cover half of the fruit. At the end of the season, the fruit peel and core are damaged, most of the damaged fruit is shed, and the core of the fruit hanging from the tree darkens, dries, and twists[2].

Sometimes the bacterium enters the inside of the fruit and rots it. The kernel of the nut darkens and a foul-smelling liquid is formed inside the fruit. The fruit dries and falls off, starting from the side of the flower. In fruits, it always begins by being a flower, and the inner texture of the flesh of the fruit turns into a brownish-black mass. Sick fruits often include *Alternaria*, *Fusarium*, sometimes *Cladosporium*, *Colletotrichum* and *Phomopsis* species, and cause mold

in them. In mycological analysis, only *Fusarium* species were isolated from the mouths of infected fruit seeds; based on this, it was concluded that the origin of the disease in Tashkent is related to *Fusarium* species and Haj bacteria.

In the following period, a new form of the disease appeared - the formation of longitudinal lesions on the bark of walnut tree stems and base branches, from which a dark liquid flows. However, when the disease is severe, the lesions have also been observed to spread to the cambium tissue.

Symptoms of the pathogen. This bacterium releases yellow pigment into the nutrient medium. One of the diagnostic signs is the formation of convex, mucous, yellow colonies in the form of a bulge in a nutrient medium containing yeast extract, dextrose and calcium carbonate.

It has been proven in molecular research and artificial insemination experiments that the strains that cause symptoms of bacterial rot in walnut stalks and base branches are a separate genetic line of the bacterium that can also produce simple symptoms of disease in leaves and fruits.

DISEASE DEVELOPMENT

The bacterium overwinters in the dormant buds of walnut and bean fruit trees, in wounds on tree trunks, in dried inflorescences, and in damaged twigs. In the spring, the bacterium infects walnut leaves and also multiplies in the form of epiphytes (saprophytes) on the leaves. Bacteria that multiply in the form of epiphytes



then pass from saprotrophic feeding to parasitic forms and enter the young members of the nut through natural (ustitsa, cold or strong rain or wind-broken areas, etc.) and artificial (wounds formed during bushing) holes, causing secondary damage. The disease spreads rapidly and develops strongly in warm (19-28c) and sernam weather conditions, especially during the flowering period when there is a lot of rain. In the absence of moisture at the optimum temperature or when the air temperature is low, the spread and development of the disease is sharply reduced. The first signs of the disease appear on the leaves and nodules, the damage of young nodes begins in the mouth of the seed. Seedlings and young trees are resistant to the disease, their damaged stems can break [1].

The pathogen spreads inside the coconut and from one garden to another through raindrops and wind and insects and canals, during grafting and pruning trees, and over long distances through seedlings and grafts in international trade processes. In recent decades, the disease has become a major barrier to the cultivation of ordinary walnut crops in a number of countries around the world.

The quantity and quality of the crop is reduced due to rot and shedding of damaged young fruits. Due to this bacteriosis, no more than 70% of the walnut crop is lost. If the disease develops late in the flowering-fruiting phase, it does not cause significant damage.

CONTROL MEASURES

Healthy seedlings should be planted when establishing plantations against bacterial rot. Young trees in the nursery are regularly inspected by a special commission and issued a certificate of health. Damaged horns and twigs should be pruned, picking and removing fruit that hangs and spills on the tree. Timely watering of trees, feeding them with balanced fertilizers will increase their resistance to bacteriosis (and other diseases).

There are no varieties that are not affected at all by bacterial rot, but the varieties differ in their levels of resistance. Frankett, Pedro in Spain, Yalova 1 and Sebin varieties in Turkey are less affected. To ensure genetic diversity in the crop, the plantation should be planted with a mixture of not one, but several walnut varieties. In addition, planting walnuts mixed with other fruit tree species also reduces disease pressure.

It is recommended to spray fungicides on walnut trees when strong development of bacterial rot is expected. In areas where in previous years the disease was observed at a dangerous level of development, when the spring frosts, protective treatments should be carried out every 7–10 days. In regions and seasons where rainfall is less observed, the time between treatments can be extended, taking into account weather forecasts. Bordeaux liquid is also allowed to be used in organic farms against bacterial

rot of nuts; the addition of 0.5% emulsion to the working fluid can increase the biological effectiveness of the drug and reduce its phytotoxicity.

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