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METHODS USED IN CONDUCTING RESEARCH IN ORCHARDS

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Abstract
The method of researching the phytosanitary condition of mulberries. In order to determine the phytosanitary condition of mulberry plantations, the farms where the study was conducted were inspected three times during the growing season each year, namely when the trees leafed out and one month after leafing out. and August-October, monitoring was carried out. Samples of infected plants were taken for laboratory testing. Disease counts and sampling were carried out diagonally, and the number of trees varied depending on the location and size of the mulberry grove.

Introduction

Disease counts were conducted separately for each variety of mulberry tree.

The method of determining the spread of diseases . The prevalence of the disease in each variety of mulberry trees was expressed as a percentage and determined based on the following formula:

$$P = \frac{\text{n x } 100}{\text{N}}$$

R - prevalence of the disease, %;
n - the number of infected plants in the sample;
N is the total number of plants in the sample.
The spread of the disease in the farm and in the district was found according to the following formula:

$$P\check{y} = \frac{\text{s x } p}{\text{S}}$$

R $_{o'}$ - the average spread of the disease in the farm or district, %;
sp - the sum of the multiplication of the distribution of the disease in each catchment area where the disease was checked;
S is the total area from which the calculation was made.

The method of determining the development of the disease . The extent to which the leaves of mulberry trees are affected by a certain disease was determined according to the following scale:

0 – not sick ;
1 – the surface is damaged up to 10%;
2 – the surface is damaged from 11 to 25%;
3 – the surface is damaged from 26 to 50%;
4 – more than 50% of the surface is damaged.

The development of diseases in mulberry trees was found based on the following formula:

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$$R = \frac{(a \text{ x } b)\ 100}{N \text{ x } K}$$

R - development of the disease, %;
(a · b) - the sum of the number of plants inspected multiplied by the level of disease;
N – the total number of plants counted;
K is the highest score.

The method of calculating and determining the damage of flour-dew disease

10 trees of each variety were observed in an orchard of up to 50 in order to obtain an estimate of the disease. If the number of trees belonging to a species was less than 50, all available trees were examined. If the plantation area is more than 50 ha, two of the monitored trees are added for every 10 ha.

A total of 100 leaves were sampled 25 randomly from all four sides and at the same height of each diseased tree. The level of the disease and its development were determined using the above methods.

4 branches were selected from 4 sides of the counted tree and 25 leaves from each branch were observed.

The degree of powdery mildew infection and disease progression on the observed leaves were determined using the above methods.

In order to find out whether the powdery mildew fungus has overwintered after leaf fall in late fall or before buds are formed in early spring, the degree of damage to branches was determined using the following scale:

0	–	healthy branches ;
1	–	the tip of the stem is slightly damaged;
2	–	¼ of the stem is covered with fungal mycelium;
3	–	half of the stem is covered with fungal mycelium and spores;
4	–	the branch does not develop well, the tip is dry, completely covered with fungal mycelium.

To determine the damage of powdery mildew disease, the length difference between 10 diseased branches of each variety and 10 branches from healthy trees of the same variety was measured.

The following scale was used to determine the degree of contamination of mulberry leaves with powdery mildew:

1 point	–	leaf on the plate one how many do you have;
2 points	–	leaves have fused spots, 50% of the leaf surface is covered with dust;
3 points	–	the leaf surface is completely covered with spots and dust.

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Cleistothecium, the causative agent of mulberry powdery mildew, overwinters with the help of the fruit body. These fruit bodies were divided into the following points according to the yield on 1 cm ^{2} of leaves:

1 point – kle y stotecii si up to 120 pieces;
2 points – kle y stotecii si up to 150 pieces;
3 points – you are a centenarian 200 donagacha.

Method of accounting for cylindrosporiosis disease of mulberry. 10% of the planted areas in the bush were examined to take into account cylindrosporiasis disease in mulberry. The disease in large trees was determined by examining 10% of the total trees. This was done by observing the plants located diagonally on the fence. The work of obtaining the account of the dynamics of the development of the disease continued from the time the disease was registered until the end of the growth period, and this work was carried out every ten days.

The incidence rate of mulberry with cylindrosporiosis was calculated based on the following scale.

1 point – several leaves are damaged;
2 points – More than 25% of leaves are damaged;
3 points – More than 27% of leaves are affected.

When leaves are infected with cylindrosporiosis, the surface of their dead tissues was expressed in the following coefficients:

1 point – 3.4% of leaf tissue was destroyed;
2 points – 8.6% of leaf tissue was destroyed;
3 points – 29.6% of leaf tissue was destroyed;
4 points – Due to the disease, 7% of the leaves in the lower part, 4.27% in the middle part and 3.5% in the third part of the mulberry fell.

Method for isolating pure cultures of pathogenic fungi in mulberry. To isolate pure cultures of pathogenic fungi from infected plants, the external surface of the tested plant part was first burned in alcohol, then in a flame, and after the external surface of the plant parts was sterilized, they were cut into small pieces 5-7 mm in size. The wet filter paper in the Petri dishes was placed on a paper surface and then placed in a thermostat with a temperature of 24-26 ^{0} C. The growth of fungi in the examined sections was determined after 3-4 days by observing them under a small microscope objective. The grown fungal mycelium or spores were inoculated onto an artificial nutrient medium with agar in a test tube.

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The level of seed infection with fusariosis was determined based on the biological method of V. I. Bilay.

The method of mushroom cultivation and identification. To grow the fungus and determine its type, a wort nutrient medium prepared according to the method of V. I. Bilai was used. The Fusarium fungus isolated from the diseased plant was planted in sterilized test tubes with nutrient medium containing wort and grown in a thermostat at a temperature of 24-26 ^{0} C. After 10-15 days, a preparation was prepared from them to determine the type of mushrooms grown. To paint the drug, a solution with the following composition was used: 1/3 volume of distilled water, 1/3 volume of alcohol, 1/3 volume of glycerin and a few drops of methylene blue. The species and group of the fungus was determined based on V. I. Bilai's systematics.

The method of determining the damage of fusariosis and the pathogenic nature of the causative agent. The following methods were used to check the pathogenicity of the Fusarium fungus isolated from the diseased mulberry tree:

- the method of planting seeds in sterilized sand. For this, mulberry seeds were artificially infested with fungal species by freezing mulberry seeds for 2 hours in a liquid wort nutrient medium in which the fungus was grown for 10 days, and these seeds were planted in sterilized sand;
- the method of artificial damage to the plant through the stem. In this method, the stem of the diseased plant was cut in the shape of a T and infected with a 10-day culture liquid of Fusarium fungus;
- the method of fungal infection in the soil. In order to infect the soil of mulberry seedlings growing by this method, fusarium fungus species grown for 7 days in a sterilized method were added to the soil at the rate of 5 g/kg or 40 g of fusarium fungus grown per 1 m ^{2} soil .

The damage of fusarium wilt disease in mulberry, the amount of reduction in leaf yield was determined based on the following formula;

$$B = \frac{(\mathrm{a} - \mathrm{b})\ x\ 100}{\mathrm{a}}$$

so V - leaf yield and decline ;
a - healthy plant leaf weight, g;
c - sick plant the weight of the leaf , g.

Leaf yield was calculated by weighing the mulberry leaves. For this, the weight of 100 diseased and healthy plant leaves was measured and the damage caused by the disease was calculated compared to the weight of healthy leaves.

A method of studying the effect of fungicides on disease-causing fungi. In order to study the effect of fungicides on disease-causing fungi, different amounts of fungicides were added to the agar nutrient medium according to options. As a control, the agar medium in which these fungi were grown without the addition of fungicide was taken.

For this purpose, agar nutrient mediums in flasks with different concentrations of fungicides were poured into Petri dishes according to options. After the nutrient medium solidified, they were inoculated with disease-causing fungi. Petri dishes were placed in thermostats with a temperature of 24-26 ^{0} C for the growth of fungi. The effect of fungicides on fungi was measured by the diameter of the colonies they formed. The growth rate of fungi was calculated between 3, 5, 7 and

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10 days.

Method for determining the effectiveness of fungicides against fusarium disease. High grade mulberry seeds were used to test the efficacy of fungicides. These seeds were treated with the study fungicides a few days before planting. Untreated seeds served as control. Treated seeds were sown in 60 cm wide rows with 20 cm spacing. Each experiment was repeated 4 times. The calculation of the experiments was carried out on the basis of observation from the time of seed germination to the end of the growing season. Ill seedlings in laboratory conditions mycological analyzed , the disease reasons it was determined . In experience watering the plants , to him processing b melting choppy make , fertilize tutchili k agrotechnics rules based on take went At the end of the growing season all seedlings by digging taken and taken away was counted . Of this for The number of seedlings h is calculated and they are total length , stem of the throat big league and of the root length was measured .

The method of determining the biological effectiveness of the drug and the implemented measures . The percent reduction in disease incidence of plants affected by the disease in the experiment compared to the control as a result of the drugs used against mulberry diseases and the implemented measures. Biological efficiency was found based on the following formula:

$$Бс = \frac{(Рн - Рт)}{Рт} \text{ x } 100$$

in this

Bs - biological efficiency, %;

Rn – development of the disease in the control option, %;

Rt is the development of the disease in the experimental variant, %.

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