Electrotechnological treatment against diseases found in almond trees grown in arid lands

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Abstract. This article explains the main diseases of horticulture trees and almonds, grown on the slopes of the hills. Currently, the protection of the environment, especially the protection of land and water resources from the effects of various toxic substances, is one of the main problems of world civilization. During the financial and economic crisis in the world, the Republic of our country is currently using high-quality land resources, introducing advanced scientific and technical agricultural technologies, producing low-quality and high-quality crops. One of the important problems. Management and control of the use of the land Fund, improvement of land relations, and effective use of public land in General. Application of electrical techniques for growing almonds, pistachios, nuts, and fruit-bearing products in the foothills. The root system of almonds clings to fungal diseases, that is, nematodes. When nematodes swell and become inflamed in the passages of tubers, they destroy the tree, especially young seedlings. We offer electrotechnical treatment for the treatment of nematode diseases of almond roots and get the results of electrotechnical experiments. To get the results of this experiment faster, we get the results by comparing photon measurements with the remote infrared spectrum. The use of electrical techniques for growing almond trees and fighting nematode diseases caused by its
roots is considered, and the results of preliminary research are presented. It also provides a brief overview of the use and control of photogeometric methods.

1. Introduction
As a result of the development of science and technology in the agricultural sector will be implemented with the new technologies, methods, machinery and work organization, new species and varieties of crops, new species, and types of farm animals. This requires the correct location of production facilities (ditches, roads, houses, warehouses, chimneys, waterworks, etc.) that are inextricably linked to the ground for efficient use of land and other production facilities. Existing land resources, including the most valuable agricultural land, remain intact. The productivity of these lands will lead to a decrease in bonus points or, ultimately, to a deterioration of their ecological status [1, 2, 3, 4, 5].

The land is involved in the production of material resources as a base and means of production. The land resources of the Republic are 44 million 410 thousand 300 hectares. of these, irrigated land is 4 million 312 thousand 400 hectares or 9.7% of the total land area, and the remaining 90.3% of the area is rich (wet or hilly). Management and control over the use of the land Fund, improvement of land relations, implementation of the state land policy in general [12, 13, 14, 15].

Today, the protection of the environment, especially the protection of land and water from the effects of various toxic substances, is one of the main tasks of world civilization. The introduction of science-based, improved agricultural technologies, high quality, and low-yield products is one of the problems [6, 7, 8, 9, 10, 11].

The area of gardens in the Republic in 1991-2017 was from 138.6 thousand hectares to 272.7 thousand hectares, and since 2010, intensive gardens have been created in the Republic on an area of more than 50 thousand hectares. The expansion of horticultural areas in recent years, in particular in connection with the creation of intensive gardens, requires a separate scientific approach to the implementation of measures to combat diseases and pests of trees, to preserve the fruit harvest in horticulture. To do this, it is necessary to plant high-quality varieties that are resistant to pests and diseases and to conduct timely agrotechnical measures to combat harmful organisms [16, 17, 18].

The almond plant (Prunus dulcis) is a small tree or shrub of the Almond subgenus of the Plum genus of the Rose family. The subgenus includes about 40 types of almonds, but in culture, common almonds are more often grown. Although almonds are considered nuts, they are actually stone fruits.
The almond tree comes from the Mediterranean and Central Asia — it appeared in these areas long before our era. Today, almonds, in addition to Central Asia and the Mediterranean, grow in California, China, the Western Tien Shan, the Crimea, the Caucasus, in the vineyards of Slovakia, the Czech Republic, and South Moravia. The almond tree prefers gravelly and stony slopes with calcium-rich soil at an altitude of 800 to 1600 m above sea level, although it grows much lower in Israel. Almonds are located in nature in small groups of 3-4 trees or bushes at a distance of 5 to 7 meters from each other [18, 19, 20].

The almond tree reaches a height of 4-6 m, and the almond shrub is 2-3 m. the almond Rhizome has no more than five skeletal roots that penetrate to a sufficient depth so that the plant does not suffer from drought. Reproduction: by budding, growth, layering, sometimes by seeds (seeds).

2. Methods

Diseases of almonds affect the plant in cases when the agricultural technology of the crop is violated or it is weakened by improper or untimely care. Most often almonds suffering from scab, and Cercospora, rust, monilia Botrytis, and shot-hole disease. Cercosporosis – this fungal disease most often affects the leaves of almonds, but if the disease progresses, the stalks and shoots of the plant can also suffer. The first signs of the disease can be found in June – rounded red-brown spots appear on the leaves with a diameter of 2 to 4 mm, and in conditions of high humidity, they form a grayish coating. Over time, in the center of the spots, the leaf tissue dries and falls out, the plant has to grow new leaves, which takes a lot of effort, and this negatively affects the development of the fruit. As a fight against the disease, as soon as its first symptoms are detected, almonds are treated with fungicides. Scab – this disease affects not only the leaves but also the flowers and shoots of almonds. As preventive measures against scab, you can consider growing disease-resistant varieties of plants, digging the site after leaf fall, preventive spring and autumn processing of almonds with Bordeaux liquid, timely pruning, and burning of diseased shoots and branches. Well, cope with a scab, as with other fungal diseases, drugs from the category of fungicides. Rust – this disease is manifested by small red spots on the upper side of the leaf plate, and on the lower side of the leaves, brownish pads are formed. Spots grow, merge, causing the leaves to dry and fall prematurely. As a rust control, almonds are treated with an aqueous colloidal suspension of sulfur. As a preventive measure, it is necessary to remove plant residues from the site in the fall and dig up the soil. Moniliosis the causative agent of this disease penetrates through the pestle of the flower and affects young shoots, leaves, and flowers of almonds. You can get rid of
moniliosis by timely processing of almonds with fungicides – for example, Horus. The shot-hole disease, or perforated spotting, affects all stone fruits. Almonds are no exception. Warm rainy weather contributes to the appearance and rapid development of the disease. The disease affects the leaves, flowers, shoots, and fruits, but the typical signs of klasterosporiosis appear primarily on the leaves of almonds — small spots of red-brown, crimson or red-purple hue. They gradually increase in size, merge, and the fabric in their center dies, brightens, and falls out. A distinctive feature of the disease is a pronounced dark border around the spots, which allows not to confuse klasterosporiosis with other diseases. With a strong lesion, gum begins to flow from the bark of damaged shoots. To combat the disease, use the treatment of almonds with Horus, Cuproxate, Skor, Topaz or Vectra, spraying the plant for the first time at the beginning of flowering, the second time after flowering, then two weeks after the second treatment. Gray rot, or Botrytis, is manifested by the formation of brown spots on the leaves and shoots, which quickly increase in size. In conditions of high humidity, the plant is covered with a gray fluffy coating consisting of spores of the fungus. This RAID is carried by the wind, and gray rot infects neighboring plants. To combat fungal diseases using such fungicides as Topaz champion, Cuproxat, Oksihom. To avoid infection with gray rot, try not to create too dense plantings and avoid getting on the leaves of fertilizers with a high concentration of nitrogen. If symptoms of the disease appear, it is necessary to cut out the affected areas, and then treat the almonds with one of these drugs. You can use the coating of the affected areas by diluting 30-40 g of the Rovral fungicide and 300-400 g of KMS glue in a bucket of water [21].

The root system of almonds is subject to the adhesion of fungal diseases, i.e. it is occupied by nematodes. Once located and swollen, in the pathways of the root's nutrient nodes, nematodes destroy the tree, especially young seedlings.

We offer electrotechnological treatment for the treatment of nematode diseases of almond roots, and we can get the results of electrical experiments. To speed up the results of this experiment, we achieve this by comparing photon measurements with the remote infrared spectrum.
3. Results
Together with scientists of the research Institute of plant Protection (I. Dusmanov-senior researcher, head of the laboratory, Ph. D. and doctoral student H. Shukurov), preliminary experiments were conducted on electric treatment of the almond root system in the Jarkurgan district of Surkhandarya region to fight against nematode diseases.
Young seedlings of two-year-old age (15 trees) were subjected to electrical treatment. The voltage of the high-voltage source was selected based on the preliminary experience of processing the root systems of tomatoes and cucumbers in greenhouse conditions prone to nematode diseases. For the 1st variant: voltage 3000 V, processing time 3 seconds, also, the seedlings were subjected to UV treatment (UFOs) with an electrical stimulator (Figure 1) for 15 seconds. The portable electrical stimulator has two bactericidal ultraviolet lamps with a wavelength of 254 nanometres.

In the second version, the voltage was increased to 5000 V, plus the UFO for 15 seconds. In the third and fourth versions, the voltage is 4000 V and 6000 V, respectively, processing seedlings without UFOs. In the fifth version, the voltage was brought to 7000 V.

**Figure 2.** The moment of conducting experiments on the farm of Jarkurgan district.
Figure 3. Electrical processing of almond seedlings

In Figure 3. Given photo electricity giving by equipment.

4. Conclusion
1. The results of the experiments (according to the observation of farm specialists) gave a positive result in the first four experiments, where the nematode completely died. The fifth option is not acceptable, because the seedling has dried up here because of the flow of the current of the big sly. The electrostimulation was developed by JSC "BMKB-Agromash", which produces them on request in stationary and field versions with hitching to tractors.
2. We also need to address the issue of power supply as these experiments are conducted and the main things to be done are far from the electricity centralized power grid and seasonally executed experiments. We can use kicnik-powered wind or solar power plants, which are manufactured in factories.

It is necessary to repeat the experiments next year in the spring and autumn
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