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Rational Use of Pebble Soils of The Fergana Valley

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ABSTRACT
For growing crops in pebble soils, more water and nutrient resources will be required than in typical gray soils. Due to the small number of dusty-silt fractions, the moisture-containing properties of pebble soils are low. In addition, they are characterized by a low humus content. The influence of manure at a rate of 30 t / ha in pebble soil irrigation contributes to an increase in the amount of humus in the soil.
Key words: *soil, fertility, stony, properties, nutrition.*

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INTRODUCTION

Rational land use leads to the economic sustainability of agricultural production. The law of positive effect in the natural soil-forming process is important. According to which, with the right system of agriculture. Based on the widespread use of the results of scientific and technological progress, soil fertility is not only not deteriorating. but it improves over time and is able to reach a very high level. The law of agriculture, which must certainly be taken into account when creating agricultural landscapes [1, 2].

In Uzbekistan, significant areas of arid lands are being developed, mainly with skeletal typical gray soils, subject to varying degrees of erosion. Only in the Fergana region, the area of fine-grained skeletal (pebble) soils is more than 140 thousand/ ha. These soils are intensively developed, but the agricultural technology of cultivating cotton fruit crops is farming. Suggests assessing the resistance of the soil to blowing by the presence of soil aggregates larger than 0.84 mm in it. A large number of such aggregates gives the soil a high resistance to wind erosion. Stubble with a high 15 cm strip width of 0.9 m will catch an average of 85% of soil particles. Ridges plowed across the direction of the prevailing wind, detain soil particles moving by rolling [3].

One of the means of protecting irrigated soils from wind erosion, K.M.Mirzazhanov considers backstage crops of wheat, corn, rye and other crops. Special experiments have shown that there are 6.5 or 35% more boxes on cotton in a plot with wings than in a sensed place [4-8].

The correspondence of the plant community to its habitat is. Since each crop has a specific ecological stability, it is necessary to correct the agro-climatic [8, 9].

In conditions of water scarcity in the world, the rational use of water for irrigation of agricultural crops is of particular importance. Since meeting the water needs of agricultural crops is directly related to the proper organization of irrigation, improving the methodology for calculating irrigation standards for agricultural crops is considered one of the important issues. [10, 12]

According to the analysis of scientists of the world, taking into account the thickness of seedlings planted on the sown area, the irrigation order is determined by performing drip and rain irrigation according to the mechanical structure of the soil, and traditional irrigation methods - according to the mechanical structure of the soil. the mechanical composition of the soil, scientific research is carried out in the context of regions.

In Uzbekistan, the main part of the land fund (about 62%) belongs to the category of agricultural land, of which 9.6% of the total land fund is irrigated land, and due to the effective use of this land fund, the

population is provided with food, fruit and vegetable and dairy products. In addition to meeting the needs of the people, it is used to grow the necessary raw materials for the development of economic sectors [7].
In the period 2018-2022, the President of the Republic of Uzbekistan planned and implemented to gradually reduce the area of cotton and sorghum sown on poor lands and replace them with economically more productive crops to further improve the efficiency of agricultural activities. In order to make reasonable use of land and water resources, special attention is paid to increasing the production of fruits and vegetables, potatoes and potato products.
In the steppe and foothill zones, skeletal low-power soils occupy about, mainly in agro-climatic areas with the most favorable climatic conditions for cultivating pomegranates and other plants, and obtaining high-quality yields [1, 11].
However, the low fertility of such soils, due to the close occurrence of limestone and cemented pebbles (conglomerates) with 80 cm or closer to the surface and a high content of skeletal particles in the volume of soils (up to 50% or more), and because of this - depletion of fine earth, humus, moisture, N, P, K, it does not allow the successful use of such soils in agriculture without their reclamation.
Pebble soils in the Fergana Valley are distributed everywhere, from the Osh region of Kyrgyzstan to Khujand in the Republic of Tajikistan. The productivity of these soils is 50% compared to ordinary gray-earth soil. Growing crops in conditions of pebble soils will require more water and nutrient resources than in typical gray soils. Due to the insignificant amount of dusty-silty fractions of moisture containing properties of pebble soils are low. In addition, they are characterized by a low humus content.
Many researchers have conducted scientific research in this area, that is, the main types of soils, their geography, agrochemical properties, reclamation state and other characteristics of the soils of the Fergana Valley are reflected in the studies of many soil scientists and agrochemists, such as E.V.Abakumov [14, 15], G.Yuldashev [15], A.T.Turdaliev [13], S.Isaev [16], K.A.Askarov [15], K.M.Mirzazhonov [17] and others.
In order to improve the agrochemical and agrophysical properties of these soils, we conduct field experiments in farms. At the same time, we set ourselves the following tasks: a) To study the effect of manure application on soil productivity against the background of high doses of mineral fertilizers; b) To determine the influence of the water regime of the soil on the dynamics of humus, nitrogen, phosphorus and potassium in it. The strong scarcity of pebble soils practically excludes the possibility of their mechanical processing. Therefore, gardens on pebble lands with a surface occurrence of stones from the moment of planting and throughout the entire period of operation are kept under natural blackened. Due to the impossibility of tillage and the incorporation of organic fertilizers, the natural grass cover is considered here as the main source of enrichment of pebble soils with organic matter and a decisive factor in increasing their fertility.
The development of arable unsuitable pebble lands for agriculture is one of the promising directions for the development of industrial crop production mainly in the foothills of Fergana. The use of these lands makes it possible to expand the area under fruit crops in the mountainous gardening zone of Uzbekistan by more than 1.5 times.
The conditions for growing fruit crops in a specific soil environment, due to the strong skeletality and high drainage of soils, approach the hydroponic culture. This determines the need for the use of a special technology, in which primary importance is attached to the methods of active regulation of soil nutrition of plants.With sufficient water supply and the application of mineral fertilizers, natural herbaceous vegetation under fruit plantations on pebble lands can form a large amount of biomass. The huge amount of organic matter that annually enters the soil with dying organs and parts of plants cannot be compensated by applying organic fertilizers, since even if there are sufficient fertilizers, it is almost impossible to seal them into the soil due to its strong stony nature[2].
On pebble lands, when blackened, fruit plants formed a well-defined root system with a significant radius of root propagation in the horizontal direction. Up to 80-90% of their amount is placed in a 0-10-20 cm layer of fine earth. A significant part of the roots is concentrated almost at the surface, at a depth of only 3-5 cm, although the thickness of the fine-grained layer provides a deeper occurrence. In adult / 20-year-old/ trees, skeletal roots reach a depth of 150-200 cm. But the main zone of placement of the root system on pebbles remains a fine-grained sediment cover and a transitional horizon.
Thus, when the roots of fruit plants are blackened, they can grow and develop no less actively than with mechanical tillage. As is known, the growth of the aboveground part of fruit trees is correlatively associated with the growth of the root system. The importance of grass cover as a component of the garden agrocenosis created on reclaimed pebble lands and the need for its regulation are shown. Various modes of mowing grass as a way to increase its phytomeliorative effect and productivity of garden plantings have been studied.[3]
Practical value. Based on the conducted research, systems have been developed for the maintenance and fertilization of the orchard in specific soil conditions, ensuring an increase in the stability of fruiting and

productivity of fruit crops, the profitability of gardening on lands that are not suitable for agriculture. Scientific research on the development of the influence of irrigation on pomegranate productivity in the conditions of light stony-gravelly gray soils of the Fergana region and to determine the effect of this irrigation on the water-physical properties of pomegranate, its growth and productivity. insufficiently studied. In connection with this goal, studies have been conducted aimed at solving the following tasks:

- to study the effect of regulation of grass cover in the garden by mowing frequency on soil fertility and productivity of garden plants;
- to establish optimal doses and combinations of mineral fertilizers for fruit plantations created on pebble lands;
- to identify the effectiveness of the use of fractional nitrogen fertilizer in the cultivation of garden crops in highly drained soils[1];

Scientific novelty. For the first time in the conditions of pebble lands, the influence of various doses of nitrogen and a combination of types of mineral fertilizers on the nutrient regime of skeletal soils, growth and productivity of apple trees was studied. The effectiveness of the use of fractional nitrogen fertilizer in gardens on these soils has been revealed. In the control experimental plots, the zoned cotton variety S-6524 was sown. For all the years of the study, we conducted phenological observation and accounting for the study of different watering rates of growth of the main stem. In the control variants, when watering according to the 3-6-1 irrigation scheme, the humus content was 0.119% higher than with the 2-5-1 irrigation scheme. This indicates that in low-power pebble soils at normal humidity (64-70% of the PPV), the transformation of plant (roots, fallen leaves and other parts into humus occurs more intensively. Thus, the introduction of organic fertilizers into pebble soils in the order of 30 tons per hectare for 3 years increases soil fertility, thereby ensuring high and high-quality yields of cotton and other crops. The implementation of manure turnover with the improvement of the water regime of the soil further increases its fertility.

In the experiments, the irrigation regime was used according to schemes 2-5-1 and 3-6-1 with a feed water consumption of 6540 m2 /ha and 6912 m2 /ha, respectively, i.e. the same rate was observed as in the experiments of the first three years. Consequently, watering rates and their multiplicity did not change. Before each watering of cotton, we determined the soil moisture according to two schemes. At the same time, we were convinced that when watering according to schemes 2-5-1, due to the rapid drainage of the soil of the pebble lands of two farms, the soil moisture was 10-15% less than normal, especially during flowering and fruit formation. This led to a certain withering of plant tissues and, in turn, to the fall of fruit organs. When watering according to the 3-6-1 scheme, the soil moisture before each watering was 70, 2-69,1 (during the growing season) percent of the PPV[5].

Watering cotton according to the 3-6-1 scheme positively affected a number of factors that ensure high yields. For example, the determination according to the 3-6-1 scheme showed that the application of organic fertilizers against the background of high doses of mineral fertilizers contributes to an increase in the content of nitrogen, mobile phosphorus, potassium and other nutrients in its various horizons than when watering according to the 2-5-1 scheme. As is known, there are more microorganisms in the soil with a sufficient amount of humus and nutrients, since it is normal [3].

Aeration optimal humidity, starting with the batteries contribute to the rapid reproduction of microorganisms. Improving the activity of microorganisms, in turn, leads to an increase in soil fertility. Thus, the introduction of manure into pebble soils at the rate of 30 t / ha, the implementation of irrigation according to the 3-6-1 scheme contributes to an increase in the amount of humus in the soil in recent years, an increase in the content of nitrogen and mobile phosphorus. As noted above, the cotton variety S-6524 was sown in the experimental plots in two farms. After that, it was carried out on April 5-12 with a tractor seeder with a width of 60 cm and a standing density of 105 thousand / ha (in typical gray soils, the standing density of this variety is 85-90 thousand / ha). Over the past three years, from the experimental plots of two farms with a standing density of 105 thousand / ha, a high yield was obtained compared to the introduction of manure, the yield of cotton was quite high, especially when watering according to the 3-6-1 scheme.

In other conditions, for example, in Central Asia, where the soils are desert gray soils, there is extremely insufficient moisture, and it is impossible to obtain high crop yields without artificial humidification (irrigation). River water, which is mainly used for irrigation of agricultural crops in Uzbekistan, is unevenly distributed. Conditions of Uzbekistan have developed anti-deflationary measures, hydromodule zoning has been carried out, irrigation regimes of cotton varieties have been studied depending on soil and climatic factors. Established schemes, deadlines, methods of watering. However, the issues of obtaining high yields of cotton on newly developed irrigated skeletal defiles of light gray soils have not been studied enough, and irrigation and nutrition regimes of various varieties are poorly studied [4, 6].

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