ВЛИЯНИЕ ОБРАБОТКИ ПОЧВЫ РАЗНЫМИ СПОСОБАМИ ПОСЛЕ ПРЕДШЕСТВУЮЩИХ КУЛЬТУР НА МАКРОСТРУКТУРУ ПОЧВЫ И УРОЖАЙ ХОРОШИХ

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THE EFFECT OF PROCESSING INTO THE SOIL IN VARIOUS WAYS AFTER PRECURSOR CROPS ON THE MACROSTRUCTURE OF THE SOIL AND THE YIELD OF THE PIT

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Аннотация. В статье рассматриваются различные методы предпосевной обработки почвы, обработка чечевицы, арахиса, подсолнечника, фасоли как для зимней пшеницы, так и для повторных посевов, а затем посев зерновых культур на глубину 35-40 см с использованием комбинированного агрегата, при этом на высоту 30-35 см поднимались семена, и вносилось 100 кг/га жидкости аммиака вглубь кустов, без добавления аммиака, также обработка проводилась на глубину 35-40 см с использованием комбинированного агрегата в вариантах без жидкости аммиака в количестве 100 кг/га. Указано, что агрономически благоприятные фракции почвы привели к дополнительному урожаю хлопка на 3,0-2,7%, а также на 2,2-2,9 ц/га от пористой обработки почвы.

Ключевые слова: комбинированный агрегат, обработка почвы, жидкий аммиак, урожай.

Abstract. The article uses various methods of pre-sowing treatment into the ground, processing lentils, peanuts, sunflower, beans as winter wheat and repeated sowing, and then sowing grain crops to a depth of 35-40 cm using a combined care unit, at one time lifting seeds to a height of 30-35 cm and placing 100 kg/ ha under a bush without liquid ammonia and treatment to a depth of 35-40 cm using a combined care unit, in variants made under one lump without liquid ammonia in the amount of 100 kg /ha, it is indicated, that agronomically favorable soil fractions achieved an additional cotton yield of 3.0-2.7%, up to 2.2-2.9 c/ha from the porous result.

Key words: combination unit, tillage, liquid ammonia, yield.

Relevance of the Research:

Currently, in our country, the cultivation of two main crops—cotton and cereal grains—has led to changes in the traditional crop systems and cultivation technologies. As a result of studying these technologies, there has been insufficient work on resource-efficient technologies, particularly those that focus on soil conservation and cost reduction through minimizing the number of tillage operations. The development of soil-conserving technologies for tillage in widely practiced crop systems is considered an important issue.

Given these factors, experiments were conducted in the conditions of the light chestnut soils of Andijan region to study the tillage practices for cotton, winter wheat, and repeated crops such as peanuts, sunflower, soybeans, and beans. The tillage practices examined included traditional, minimal, and resource-efficient technologies based on the use of combined aggregates. The research also aimed to use plant residue from previous crops, such as stems and roots, efficiently and to apply 100 kg/ha of liquid ammonia under the crop residue to observe the growth, development, and changes in agro-physical processes in the soil.

Research Methodology:

The research was conducted at the “Oq Suv Experimental” farm in the Qorgontepa district of Andijan region, where the light chestnut soil has a medium sandy texture, is non-saline, and has groundwater at a depth of 4-5 meters. The organic matter content in the plow (0-30 cm) layer varies from 0.8-0.9% depending on the degree of humification. The soil contains 0.05-0.09% nitrogen, 0.15-0.25% phosphorus, and 1.5-2.0% potassium. The mechanical composition of the soil varies from medium sandy to heavy sandy soil, with large dust particles making up 44-51% and fine dust particles constituting 30-40%.

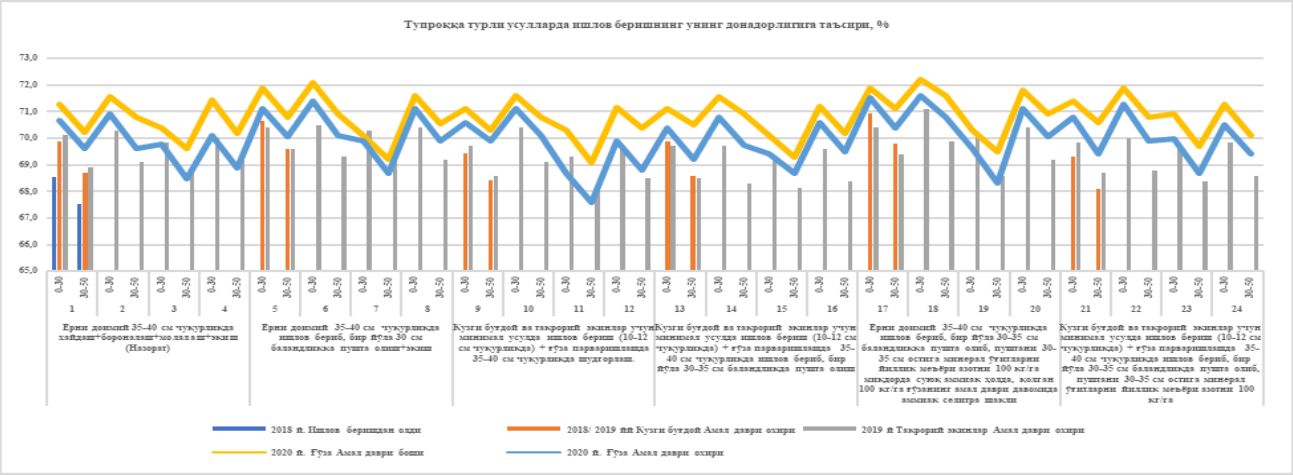
Research Results:

In our studies, during the cultivation of winter wheat, followed by repeated crops such as peanuts, and then cotton, tillage was carried out at a constant depth of 35-40 cm (including plowing + harrowing + rolling + sowing) until the end of the cotton growing season in 2020. In comparison with the state of the soil in 2018, the amount of agronomically favorable soil fractions in the 0-30 cm layer increased to 70.9%, a 2.3% improvement from the initial state. Moreover, the application of this tillage technology in fields growing repeated crops such as peanuts, sunflower, and soybeans led to an increase in these values by 0.2-1.1%.

When minimal tillage technology was applied with a 10-12 cm depth for the cultivation of winter wheat and repeated crops like peanuts, sunflower, and beans, the soil's agronomically favorable fraction increased by 0.1-2.5%.

In fields where tillage was performed at a constant depth of 35-40 cm and then 30 cm high ridges were formed for sowing, agronomically favorable fractions of the soil increased by 1.3-2.8% by the end of the cotton growing season, compared to the initial soil condition in 2018. When liquid ammonia at a rate of 100 kg/ha was applied under the cotton residue (17-20 treatments), the increase in agronomically favorable fractions was observed to be as high as

3.0%. It was found that applying liquid ammonia under the crop residue during cotton cultivation increased the soil's favorable fraction by 0.2%. (See Figure 1.)



Tillage Practices and Yield Results

When the land was tilled at a constant depth of 35-40 cm, followed by harrowing and rolling, cotton yields ranged from 43.6 to 39.9 centners per hectare. In areas where peanuts were grown as a preceding crop, an additional 1.5-3.7 centners per hectare were obtained compared to other crops.

For the cultivation of winter wheat and repeated crops such as soybeans, peanuts, sunflower, and beans, the minimal tillage technology was applied with a 10-12 cm depth, and for cotton cultivation, a 35-40 cm depth tillage was followed by ridging, harrowing, rolling, and sowing. The cotton yield in these fields ranged from 44.6 to 39.8 centners per hectare. In the peanut cultivation variant, the additional yield was observed to be 2.7-4.8 centners per hectare compared to other repeated crops.

In fields where tillage was performed at a constant depth of 35-40 cm, and 30-35 cm high ridges were created for sowing, the cotton yield ranged from 45.4 to 40.1 centners per hectare. In the variant where peanuts were grown, the additional yield compared to other crops was 2.5-3.1 centners per hectare. Furthermore, when liquid ammonia at a rate of 100 kg/ha was applied under the crop residues (17-20 variants), the yield increased by 3.6-5.4 centners per hectare, and applying 100 kg/ha of liquid ammonia to the cotton residue increased the yield by 1.0-1.1%.

For the cultivation of winter wheat and repeated crops, the field was treated before sowing with minimal tillage technology at a 10-12 cm depth, and for cotton cultivation, 35-40 cm deep tillage was performed, with 30-35 cm high ridges formed for sowing (13-16 variants). In the peanut cultivation variant, the additional yield was 2.8-5.0 centners per hectare compared to other repeated crops. Similarly, applying 100 kg/ha of liquid ammonia to the cotton residue (21-24 variants) resulted in an additional cotton yield of 0.9-1.0 centners per hectare.

Conclusion:

The results of the research indicate that by applying different tillage methods before sowing, the constant tillage depth of 35-40 cm, followed by ridging to a height of 30 cm, and the application of 100 kg/ha of liquid ammonia under the crop residues, the soil's quality increased by 3.0-2.7%, and additional cotton yields of 2.2-2.9 centners per hectare were obtained. The application of minimal tillage technology at a 10-12 cm depth followed by the same process for cotton cultivation resulted in an increase in soil quality and an additional yield of 2.2-2.9 centners per hectare compared to the initial tillage.

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