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EFFECT OF REPEATED CROPS ON SOIL AGROPHYSICAL PROPERTIES IN SHORT-ROW VEGETABLE-CEREAL, VEGETABLE-COTTON ROTATION SYSTEMS

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Abstract
In article, results of researches had been adduced and analyses as the main sowing of the cotton and grain in the field of past crops, on the gray soils of Andijan region, sowing of soy, mash, corn and their effect on the agrophysical qualities of the soil.

Keywords: Cotton, vegetable, mung bean, soybean, soil porosity, water permeability, repeated crops, legumes, productivity.

Introduction

Among leguminous crops, soybean and mung bean are currently cultivated in various soil and climatic conditions of our Republic as crops that improve soil fertility, ensure ecological stability in the soil, are not picky about soil, are drought-resistant, and are good companions for most agricultural crops, especially grain and cotton. This shows how important and urgent the issue of increasing soil fertility and meeting the population's demand for food is in the Republic [1, 2]. Based on this, the cultivation of leguminous crops in the areas freed from cotton and grain and the establishment of the cultivation of these crops as a repeated crop after the autumn grain crops will serve to maintain and increase the fertility of our soils in the future.

It is worth noting that all agricultural crops grown after legumes give good results. In India, China, Brazil and other countries, legumes occupy a leading place in crop rotations and rotations. Legumes are of agrotechnical importance, accumulating biological nitrogen and organic matter in the soil. Crop rotation is one of the most important organizational and agrotechnical measures in agriculture that improves the amelioration of soil, increases productivity, effectively uses irrigated land, combats weeds, plant pests and diseases, and ensures consistent, abundant and high-quality harvests from agricultural crops [5, 6].

The insufficient formation of a scientifically based system in the rational placement of agricultural crops such as vegetables, potatoes, rice, grains, legumes in the cotton and winter wheat complex for multi-sectoral farms of Andijan region limits the possibilities of obtaining high yields from agricultural crops, in this case, new crop rotation systems are used. requires the development or improvement of existing ones on a scientific basis.

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Degree of Study:

In the republic, scientific research was conducted on the clover-cotton rotation system to increase soil fertility and obtain high and quality yields from agricultural crops by Z. Tursunkhojaev, V. Berezovsky, A. Bolkunov, K. Mirzajonov, Sh. Nurmatov, N. Urazmatov, A. Kashkarov, and later on the short-row cotton-grain rotation system by R. Oripov, R. Tillyaev, B. Khalikov, F. Namazov, B. Izbosarov, M. Avliyakulov, as well as foreign scientists S. Brown, J. Keatinge, D. Luquet, A. Vidal, M. Smith. However, in the valley regions of the republic, in particular, Andijan region, in light gray soils, the role of crops such as vegetables, potatoes, mung beans, soybeans and corn as predecessors of winter wheat and cotton in the vegetable-grain and vegetable-cotton crop rotation systems have not been sufficiently studied.

In the region, in the farms specializing in cotton, grain and vegetable growing, crops that maintain and increase soil fertility are selected in the short-rotation systems, and high-quality crops are grown, and scientific research is being carried out in order to satisfy the population's demand for food.

Methods and Materials:

Phenological observations and calculations in repeated crops and winter wheat varieties were carried out based on the manuals “Methodology of State Variety Testing of Agricultural Crops”, “Methodology of Research with Legume Crops”, and methodological manuals adopted at the UzPITI (1973, 1981, 2007). Statistical analysis of the data was carried out using the WinQSB-2.0 and Microsoft Excel programs according to the method of B.A. Dospekhov “Methods of Field Experiments” (1964).

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Research Results:

Field experiments were conducted on the lands of the farms “Ming Urik Osmani” and “Victoria Asaka” located in the Asaka district of Andijan region. The soil of the experimental field is light gray, the mechanical composition is medium loamy, irrigated from the old well, not saline, the groundwater is located 4-5 m below the surface of the earth. The amount of humus in the soil layer is 0.8-1.0%, total nitrogen is 0.079-0.081%, phosphorus is 0.150-0.153%, and the bulk density is 1.40-1.43 g/cm^3.

The studies were conducted in short-rotation (1:1) vegetable-grain and vegetable-cotton cropping systems [8], and both experimental systems were as follows: to prepare the background for 2016, potatoes were planted as the main crop in background 1, cabbage in background 2, cucumber in background 3, and carrots in background 4. After the main crops were harvested, soybeans, mung beans, and corn were replanted in each agrobackground. Potatoes of the fairy tale "Zarafshon", cabbage "Iyunskaya", cucumbers "Khosildor" and carrots "Mushak 95" were planted. Mineral fertilizers were applied at the annual rates of NPK 200-140-100 per hectare. Soybean "Nafis",

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mung bean "Pobeda-104" and corn "Uzbekistan-306 AMV" were planted. During the repeated soybean and mung bean application period, NPK was applied at the rates and rates of 60:90:60 per hectare, and corn was applied at the rates and rates of NPK 200:140:100.

After harvesting the early vegetables, soil samples were taken to determine the initial agrochemical characteristics of the soil composition. Also, before planting repeated crops, work was carried out to determine the bulk density of the soil and other water physical properties. **1- experience** It consisted of 16 variants, each with a total area of 240 m^2 (length 50 meters, width 4.8 meters), of which the calculation area was 120 m^2, and was conducted in 3 repetitions, with a total area of 1.15 hectares **[8]**.

1- EXPERIENCE SYSTEM

(Short-row (1:1) vegetable-cereal crop rotation system, 2019-2023)

Bap. №	Fairy tale vegetable crops	Repetitive crops	Main crop
1	Potatoes (NPK 200:140:100 kg/ha)	No repeat crop is planted (control)	Winter wheat
2	Cabbage (NPK 150:105:75 kg/ha)	No repeat crop is planted (control)	Winter wheat
3	Cucumber (NPK 150:105:75 kg/ha)	No repeat crop is planted (control)	Winter wheat
4	Carrot (NPK 200:140:100 kg/ha)	No repeat crop is planted (control)	Winter wheat
5	Potatoes (NPK 200:140:100 kg/ha)	mung bean (NPK 60:90:60 kg/ha)	Winter wheat
6	Cabbage (NPK 150:105:75 kg/ha)	mung bean (NPK 60:90:60 kg/ha)	Winter wheat
7	Cucumber (NPK 150:105:75 kg/ha)	mung bean (NPK 60:90:60 kg/ha)	Winter wheat
8	Carrot (NPK 200:140:100 kg/ha)	mung bean (NPK 60:90:60 kg/ha)	Winter wheat
9	Potatoes (NPK 200:140:100 kg/ha)	soybean (NPK 60:90:60 kg/ha)	Winter wheat
10	Cabbage (NPK 150:105:75 kg/ha)	soybean (NPK 60:90:60 kg/ha)	Winter wheat
11	Cucumber (NPK 150:105:75 kg/ha)	soybean (NPK 60:90:60 kg/ha)	Winter wheat
12	Carrot (NPK 200:140:100 kg/ha)	soybean (NPK 60:90:60 kg/ha)	Winter wheat
13	Potatoes (NPK 200:140:100 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Winter wheat
14	Cabbage (NPK 150:105:75 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Winter wheat
15	Cucumber (NPK 150:105:75 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Winter wheat
16	Carrot (NPK 200:140:100 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Winter wheat

Note: In winter wheat cultivation, mineral fertilizers were applied at the rates of NPK 200:140:100 kg/ha..

2- experience the experiment consisted of 12 variants, with a total area of 240 m^2 for each variant, of which 120 m^2 was taken into account. The experiment was conducted in 3 replications, with a

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total area of 0.8 hectares [8].

According to the purpose and task of the research, as a result of crop rotation, it is determined the impact on the important physical and chemical properties of the soil, first of all, the soil bulk density and porosity properties were determined in the field experiment. Soil bulk density and porosity create favorable soil conditions for plant growth and development.

From this point of view, the agrofons formed as a result of potato and cabbage cultivation each create their own soil environment and play an important role in the life of the plant throughout the entire growth period. For example, in the variant of repeated sowing of soybean in the background of potatoes and cabbage as the main crops, the bulk density of the soil arable layer (0-30 cm) at the beginning of the operation period was on average 1.31, but by the end of the operation period it was 1.37 g/cm^3, having become compacted to 0.06 g/cm^3 (varies 1 and 4). The bulk density of the soil under the arable layer (30-50 cm) was compacted to 0.05 g/cm^3, having become 1.38 g/cm^3. We can say that in this variant, favorable soil conditions were created for the normal growth and development of plants.

Similar soil conditions were observed in the second variant with repeated sowing of mung bean. In this case, the soil density increased by 0.04-0.05 g/cm^3 compared to the soil density at the beginning of the period of operation, which was equal to the result obtained with soybean. In the variant with maize, the soil density increased by 0.07 g/cm^3, depending on the soil layer. It turned out that the density increased by 0.02-0.03 g/cm^3 compared to the variants with soybean and mung bean. This is because in this variant, soil density increased under the influence of inter-row tillage, irrigation and other measures. In addition, due to the strong development of the root system and the supply of nutrients, maize had a strong impact on the water and physical properties of the soil. Also, the porosity of the soil showed positive properties depending on the volume weight. For example, in the variant planted with soybeans, the porosity of the soil layer (0-30 cm) was 51.5% at the beginning of the operation period. At the end of the implementation period, it was found that it decreased by 2.2% and amounted to 49.3%. The same soil conditions were created in the option planted with mash, and soil porosity decreased by only 0.3% compared to the option planted with soybeans. In option 3, where corn was planted and maintained, the porosity of the soil decreased by 1.6-1.8% and reached 48.9-48.2, corresponding to the plowing layers. Similar results were obtained with respect to the volume weight and porosity of the soil produced in the potato agrophone in repeated soybean and corn variants (4-6 var) planted in the cabbage agrophone.

So, as a result of repeated soybean and moss care in the background of potato and cabbage cultivation, it was possible to maintain the soil conditions of potato and cabbage cultivation in the same way. The water and physical properties of the soil are improved according to soil conditions and characteristics of repeated shade and moss root system. Also, in repeated soybean and moss planted variants of the experiment, the improvement of the physical properties of the soil had a positive effect on the chemical processes, as a result of which the increase in nutrients was ensured.

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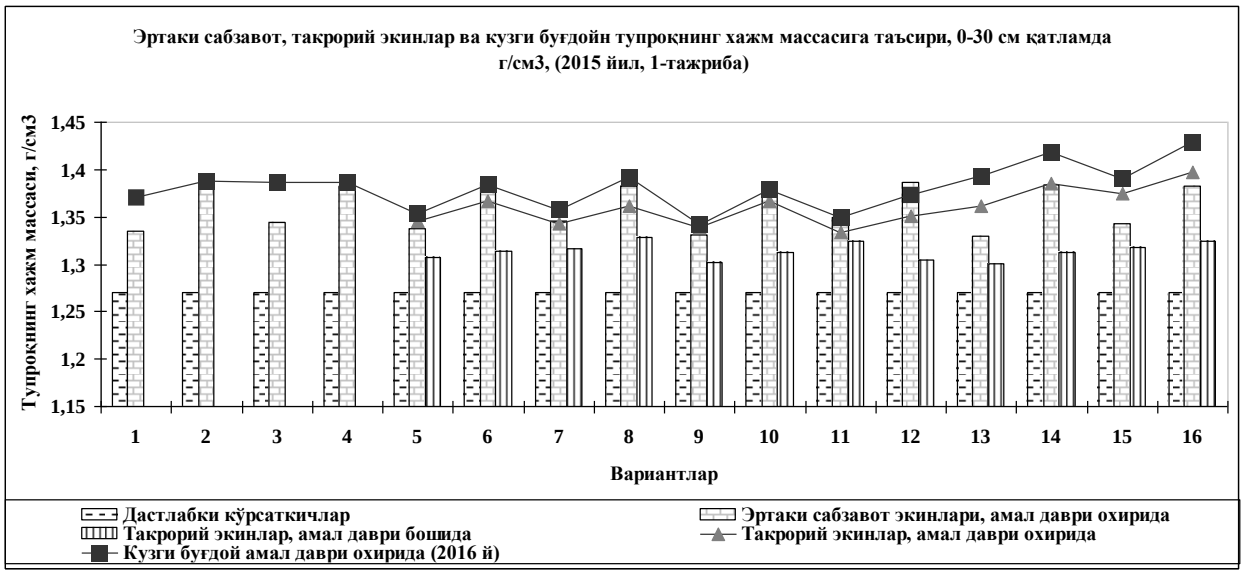

1-fig. Effect of fairy vegetables, repeated crops and winter wheat on soil bulk density, g/cm^3, (2015, experiment 1)

Conclusion

Compared to other vegetable crops, potato and cucumber reduce the volume mass of the soil by 0.04-0.05 g/cm^3, improve its porosity by 0.8-1.3%, water permeability by 12-14% (70-80 m^3/ha) was determined. When a repeated crop of soybeans was planted after the first potato and cucumber, it was observed that the volume mass of the soil improved by 0.02-0.03 g/cm^3, porosity by 0.5-0.9%, and water permeability by 10-16% compared to the options planted with mung beans and corn.

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