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Article

Effects Of Repeated Cropping Of Moss On Soil Volume and Porosity

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Abstract: The article provides information on the use of different methods of tilling the soil in the care of winter wheat and repeated crops, including the effect of soil volume mass when using cultivation and resource-saving agrotechnology (using the Ilgor-1 unit) and plowing with high-efficiency equipment.

Keywords: Soil, Combined Unit, Mung Bean, Wheat, Bulk Mass, Using The Ilgor-1 Unit, Cultivator

1. Introduction

A total of 100 mln. crops are being cultivated on an area of more than one hectare. One of the advantages of modern minimum soil tillage is that it is possible to reduce the input of equipment to the fields by 40%, resources by 40%, and labor force by 25%. Currently, the price of fuel and lubricant products is increasing sharply, in agricultural practice, it is necessary to use resource-efficient technology in order to reduce the cost of cultivated products[1]–[3].

In the developed countries of the world, various scientific studies are being conducted on the application of resource-efficient agrotechnology to the soil, depending on the soil and climate conditions[4]–[6]. In this, special attention is paid to conducting scientific research that improves agrophysical and agrochemical properties of soil, preserves soil fertility and serves to increase it. Therefore, conducting research on improving resource-efficient agrotechnologies in the cultivation of winter wheat and repeated crops is considered an urgent issue[7]–[10].

V.Kondratyuk [4], I.Revut [5], L.Slesareva, S.Ryjov [6] and other scientists in Uzbekistan, for the most convenient growth and development of the plant, the volume mass of the soil should be in the range of 1.1-1.3 g/cm3 emphasized.

According to M.Tojiev, K.M.Tadjiev, N.M.Ochildiev [7], any repeated and siderate crops planted after winter wheat leave a certain amount of organic residues in the soil, maintain its fertility and reduce the volume mass of the soil to 0.05-0, A decrease of 09 g/cm3 led to an increase in soil compaction up to 20%, and a decrease in productivity by 5-8%.

I.Karabaev [8], F.M.Khasanova, I.T.Karabaevlar [9; 10] after harvesting the autumn wheat crop, the soil is cultivated with a cultivator at a depth of 8-10 cm, and when repeated crops of soybeans and corn are planted in one row, the volume mass of the soil is 0.034 in the plowing (0-30 cm) layer compared to the cultivation with a chisel at a depth of 16-18 cm. was found to improve up to g/cm3.

In the scientific research conducted by F.Khasanova, D.Mavlyanov [11] in the conditions of typical gray soils of the Tashkent region, the volume mass of the soil after

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winter wheat was plowed at a depth of 28-30 cm compared to the plowing without irrigation at a depth of 28-30 cm. cm) in the layer decreases to 0.05 g/cm3, and in the under-drive (30-50 cm) layer to 0.03 g/cm3, and porosity increases to 1.1%.

Therefore, reducing the impact on agrophysical indicators, maintaining and increasing soil fertility by using resource-saving agrotechnologies in the cultivation of winter wheat and repeated crops, growing high and low-cost crops from cultivated crops are urgent issues.

Experience system. Research on improvement of resource-efficient agrotechnologies in the cultivation of winter wheat "Krasnodarskaya-99" and repeated mush "Krasnadarskaya-104" varieties in the years 2017-2019 in the areas of Andijan region with a light gray color, medium sand, non-saline, underground water at a depth of 4-5 meters conducted through the experimental system presented in Table 1.

Table 1 Experience system

№	The method of tillage	Crop type	The method of tillage	Crop type
1	Cultivator between the rows of cotton to a depth of 8-10 cm and sow in one row	Winter wheat	Plowing, harrowing, grinding, planting at a depth of 28-30 cm	Repeat crop
2			Cultivator tilling the previous crop at a depth of 8-10 cm	
3			Cultivating using Ilgor-1 combine harvester, picking and planting rice at a height of 30-35 cm in one go	
4	Plowing, harrowing, grinding, planting at a depth of 28-30 cm		Plowing, harrowing, grinding, planting at a depth of 28-30 cm	
5			Cultivator tilling the previous crop at a depth of 8-10 cm	
6			Cultivating using Ilgor-1 combine harvester, picking and planting rice at a height of 30-35 cm in one go	
7	Processing with the help of the Ilgor-1 combined unit, picking and planting rice at a height of 30-35 cm in one go		Plowing, harrowing, grinding, planting at a depth of 28-30 cm	
8			Cultivator tilling the previous crop at a depth of 8-10 cm	
9			Cultivating using Ilgor-1 combine harvester, picking and planting rice at a height of 30-35 cm in one go	

2. Materials and Methods

The methodology of this research involved field experiments conducted between 2017 and 2019 to investigate the effects of different tillage methods and the use of resource-saving agrotechnology on the soil's agrophysical properties, particularly soil volume and porosity. The study took place in Andijan, Uzbekistan, focusing on winter wheat and repeated cropping. Different tillage methods were employed, including the use of a cultivator, plowing, harrowing, and the Ilgor-1 combined unit. The field experiments assessed soil volume and porosity at the beginning and end of each cropping cycle. The primary tools used for data collection were metal cylinders, which measured the bulk mass and porosity of soil layers ranging from 0 to 50 cm. Data was analyzed for both the plowed

layer (0-30 cm) and sub-plowed layer (30-50 cm). The experiments compared various approaches such as cultivating with a combined unit, single-row planting, and multi-row planting. Soil volume mass and porosity were measured after each cycle to evaluate the effects of these tillage methods on the soil's condition. Statistical analysis determined the correlation between these methods and the changes in soil properties. The use of the Ilgor-1 combined unit showed promise in reducing soil density while maintaining porosity, making it a more efficient option for improving soil health in repeated cropping scenarios.

3. Results and Discussion

From the agrophysical properties of the soil, volume weight and porosity were determined in the 0-50 cm layer, at the beginning and at the end of the application period, using a metal cylinder with a volume of 500 cm^3, in every 10 cm layer, according to the method of N.A.Kachinsky. Data analysis was carried out in the driving (0-30 cm) and sub-driving (30-50 cm) layers.

In our research, observations on bulk and porosity of the soil were made at the beginning and end of the growing season of mash grown as a repeated crop. In all options, by the end of the implementation period, it was found that the volume mass of the soil increases and the porosity decreases.

In the area where the research was carried out, the cotton was cultivated with a cultivator at a depth of 8-10 cm between the rows, and winter wheat was cultivated in one row. In the 1st option with seeds planted, the volume mass of the soil in the tillage (0-30 cm) layer at the beginning of the application period (27.07.2017) was 1.335 g/cm3, and by the end of the application period, it was observed that the volume mass increased to 1.95%

Winter wheat is cultivated with a cultivator at a depth of 8-10 cm between the rows of cotton, and the area sown in one row is cultivated with a cultivator at a depth of 8-10 cm, and seeds are sown in one row. it was found that the mass increases to 0.029 g/cm^3.

Cultivator between the cotton rows at a depth of 8-10 cm, the area planted with winter wheat was cultivated with a field Ilgor-1 combined unit for repeated crop maintenance, and cotton was removed to a height of 30-35 cm in one path, and then planting activities were carried out.

In the 3rd option, compared to the beginning of the operation period, it was found that the volume mass of the soil at the end of the operation period will increase to 0.025 g/cm^3.

Agrotechnical activities such as plowing, harrowing, grinding were carried out in the field for repeated crop maintenance at a depth of 28-30 cm.

In the 4th option, it was observed that the bulk mass of the soil in the tillage layer (0-30 cm) increased to 0.022 g/cm^3 at the end of the operation period compared to the beginning of the operation period.

After harvesting the winter wheat crop, the field is plowed to a depth of 28-30 cm, the planted area is cultivated to a depth of 8-10 cm using a cultivator, and repeated crop seeds are sown in one way, and in the 5th variant, the bulk mass of the soil at the end of the operation period is 0.026 g/ it was found to increase up to cm^3.

The field was plowed to a depth of 28-30 cm, and the area planted with winter wheat was treated with the Ilgor-1 combined unit for repeated crop maintenance, and in the 6th option, when the field was plowed to a height of 30-35 cm, then planting measures were carried out at the end of the operation period compared to the beginning of the operation period. it was determined that the volume mass of the soil increases to 0.024 g/cm^3.

The field for the maintenance of winter wheat seeds is plowed to a depth of 28-30 cm, in the background of agrotechnical measures such as plowing, harrowing, and threshing, the field for maintenance of repeated crops is plowed to a depth of 28-30 cm. the volume mass of the soil increased to 0.004 g/cm3 in the driving layer (0-30 cm), and increased to 0.002 g/cm^3 in the 6th option, which was treated with the Ilgor-1 combined

aggregate, and it was collected to a height of 30-35 cm, and it was found that the density of the soil increased.

Working with the Ilgor-1 combined unit, agrotechnical activities such as plowing, harrowing, and milling were carried out in the 7th option, in the background of winter wheat, in the background of which winter wheat was cared for, the area for repeated crop maintenance was plowed, harrowing, and grinding. In the (0-30 cm) layer, it was observed to increase to 0.018 g/cm^3 at the end of the operation period compared to the beginning of the operation period.

In the 8th variant, where winter wheat is processed with the Ilgor-1 combined unit, the wheat is harvested at a height of 30-35 cm, the planted area is cultivated at a depth of 8-10 cm with a cultivator, and repeated crop seeds are sown and cared for in the 8th option, respectively, this indicator is 0.022 up to g/cm^3, after processing the background with the Ilgor-1 combined unit, taking cotton to a height of 30-35 cm, and then planting it in the 9th option, it was found that the bulk mass of the soil increased to 0.020 g/cm^3 at the end of the operation period compared to the beginning of the operation period.

For the care of winter wheat seeds, it is treated with the Ilgor-1 combined unit, and the field is plowed to a depth of 28-30 cm in the 8th option, where the crops were planted in one row, the volume mass of the soil was up to 0.005 g/cm^3 in the tillage (0-30 cm) layer, in the 6th option, 0.001 g/cm^3 was harvested with the Ilgor-1 combined unit increased to cm3, it was found that the density of the soil increased. (Figure 1).

Along with the volume mass of the soil, the porosity of the soil was also studied in the research area. In this case, plowing with a cultivator at a depth of 8-10 cm between the rows of cotton, plowing the soil porosity (0-30 cm) of the field treated with winter wheat in a layer of 28-30 cm deep for repeated crop maintenance at the end of the operation period. agrotechnical activities such as harrowing and threshing were carried out, up to 1.0% in the 1st option in the field where mosh seeds were sown as a repeated crop, up to 1.1% in the 2nd option, where the seeds were sown in a single row with a cultivator at a depth of 8-10 cm, Advanced- A reduction of up to 0.9% was observed in the 3rd variant, which was treated with the combined unit 1, took cotton to a height of 30-35 cm, and then planted (Fig. 1).

The area for planting winter wheat seeds is plowed to a depth of 28-30 cm, and the same area for repeated crop maintenance is plowed to a depth of 28-30 cm. In the 4th option, soil porosity is up to 0.8%, a cultivator is used at a depth of 8-10 cm. in the 5th variant, which was treated with the help of a single pass, repeated crop seeds were sown and cared for, up to 1.0%, in the 6th variant, in which the 6th variant, when the seeds were planted to a height of 30-35 cm in one pass, with the Ilgor-1 combined unit It was found to decrease to %.

In the 7th variant, the field is plowed to a depth of 28-30 cm for repeated crop maintenance, the level of porosity in the plowed (0-30 cm) layer of the soil is treated with the Ilgor-1 combined unit, and the field is plowed to a height of 30-35 cm. up to 0.7%, tilling with a cultivator at a depth of 8-10 cm, repeated crop seeds are sown once, and in the 8th variant, which is cared for, this indicator is up to 0.8%, processed with the Ilgor-1 combined unit, once 30 It was found that it decreased to 0.7% in the 9th variant, which was planted to a height of -35 cm.

In our research, when cultivating winter wheat seeds with the Ilgor-1 combined unit, the soil was plowed to a depth of 28-30 cm, and the soil was plowed to a depth of 28-30 cm. It was observed to be more than 1-0.3%. In the same background, it was found that there is no big difference compared to the plowing option, but it is economically effective when using a cultivator, single-row planting and Ilgor-1 combined unit, picking up cotton to a height of 30-35 cm in one row.

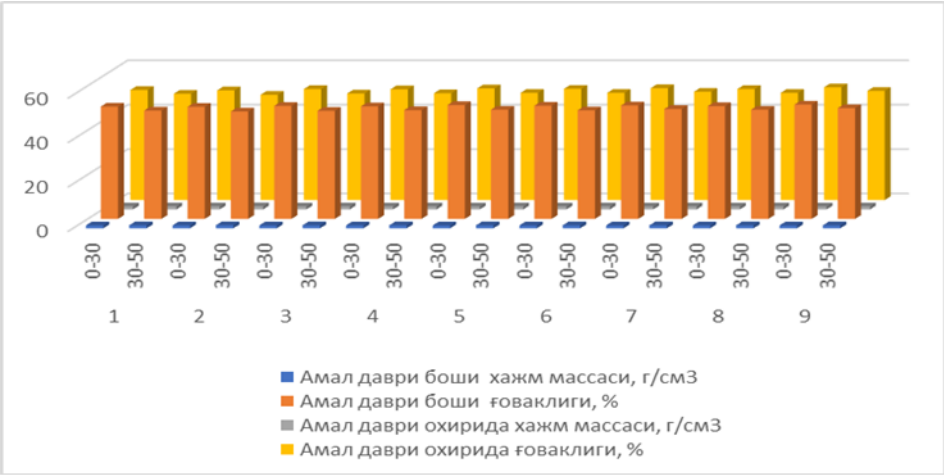

Figure 1. *Effect of repeated cropping on soil volume and porosity of winter wheat with different methods of cultivation (2017)*

4. Conclusion

In conclusion, it can be noted that the field for the cultivation of repeated crops in three different backgrounds where the processing technologies used for the maintenance of winter wheat seeds were cultivated with the Ilgor-1 combined unit, the field was harvested at a height of 30-35 cm, and the area was 28-30 cm when planted. Compared to the area where agrotechnical measures such as plowing, harrowing, and grinding were carried out, and the area where one-way planting technology was used, the density of the soil in the plowed layer (0-30 cm) decreased to 0.004-0.022 g/cm3, and the porosity decreased to 0.2-0 It was found to increase up to .8%.

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