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IMPACT ON SOIL MICROBIOLOGICAL PROPERTIES

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Abstract. *Planting preceding crops such as mung bean, peanuts, perko, rapeseed, and perko+amaranth+mustard on fields freed from winter wheat activates microbiological processes in both 0-30 cm and 30-50 cm soil layers. As a result, the reproduction of microorganisms intensifies, and their numbers increase significantly.*

Keywords. *Preceding crop, mung bean, peanut, perko, rapeseed, perko+amaranth+mustard, supplementary feed, compost.*

INTRODUCTION

Numerous studies have reported positive results from growing grains in crop rotation systems, especially in fields affected by wilt. Special substances released during root activity tend to awaken fungi that are in a dormant state. In reality, these fungi cannot infect plants. In reality, these fungi cannot infect plants. Awakened fungi die under unfavorable, unprotected conditions and in the presence of other microorganisms. Compared to lands where mung beans are continuously cultivated after grain crops, mung bean wilt infestation decreases by 20-30%, yield increases by 1.5-3.0 centners, and quality improves. [1-12].

It is known that agricultural crops worldwide absorb 100 million tons of nitrogen annually from the soil, with 12 million tons returned through mineral fertilizers, while the remaining 88 million tons are compensated for by nitrogen-fixing microorganisms. Soil contains numerous microorganisms; for instance, 1 gram of soil contains millions or billions of bacteria. Compared to air and water, bacteria are more abundant in soil. Soil serves as the primary source from which microbes transfer to air and water. According to analyses, up to 3-5 tons of bacteria are found in the 25 cm layer of 1 hectare of arable land [13-25].

Research methods. All observations, analyzes and calculations in the research were carried out on the basis of "Methods of conducting field experiments", the amount of nutrients in the soil and agrophysical analyzes " Methods of agrochemical, agrophysical and microbiological research and irrigation of agricultural districts " (1963) .

Results and analyses. The taxonomic (bacteria, fungus, actinomycete) and physiological (azotofixer, nitrofixer) groups of microorganisms in the soil determine the course of the processes taking place in it. Soil humification, ammonification, nitrification, nitrogen fixation, denitrification processes are carried out with the participation of microorganisms. Therefore, microbiological activity of the soil is

important in optimizing its productivity, properties and properties. Microbiological activity of the soil and the number and ratio of different groups of microorganisms in it are affected by various factors. One of such factors is cultural plants planted as predecessor crops. Due to the differences in the composition and amount of root and root residues of different crops, as well as the selectivity of microorganisms, they have a specific effect on the microbiological activity of the soil. In our research, the number of taxonomic groups of microorganisms, such as bacteria, fungi and actinomycetes, in the soil of these variants before planting mush, corn, peanut, mush, and rape crops on fields freed from winter wheat does not differ significantly. A similar situation was observed in the number of physiological groups of microorganisms such as nitrogen fixers and nitrifiers. The number of microorganisms of all species and physiological groups decreased towards the lower layers of the soil. This situation was observed in all options, it was found that the number of bacteria in the soil was lower in the options planted with winter wheat than in the options planted with mung bean. This situation was observed in the 0-30 and 30-50 cm layers of the soil before and after previous crops.

Before the predecessors, after winter wheat, the number of bacteria in the 0-30 cm layer of the soil was 35.5 million/g, while in the 30-50 cm layer it was 23.2 million/g, this indicator it was found to be 38.3 and 28.4 mln/g in the 0-30 and 30-50 cm layers in the mosh crop, respectively.

In our experiment, when winter wheat was planted in the (control) variant, that is, after planting the previous crops, the number of bacteria in the 0-30 cm layer of the soil was 41.4 million/g, in the 30-50 cm layer 26.2 million/g. g, 53.3 and 28.4 in layers 0-30 and 30-50 cm after planting It was found to be million/g. It is due to the abundance of bacteria in the soil in the varieties that are predecessors of mush, the accumulation of mush root and stem residues, and the high content of nitrogen in comparison with winter wheat.

There was no significant difference in the number of bacteria in the 0-30 and 30-50 cm layers after planting the predecessor crops in the winter wheat (control) variant, when corn was planted as a predecessor crop, the number of bacteria in the soil in the 0-30 and In layers of 30-50 cm, the control, i.e. winter wheat, increased compared to the planted option. In the winter wheat control option, the number of bacteria in the soil in the 30-50 cm layer was 26.2 million/g, while in the previous mash-planted options, it was 53.3-28, respectively, in the 0-30 and 30-50 cm layers. 4 million/g, and when corn was the predecessor, it was found to be 50.3 and 33.1 million/g (Table 4.7).

When analyzing the effect of previous crops on the biosphere of the soil in the experiment, it was found that the flora of microorganisms differed sharply between species according to the experimental options. It was found that the number of bacteria, nitrogen fixers, nitrofixers, fungi, and actinomycetes in the soil increased by 3-4 times and more, depending on the type, compared to the number before the predecessors were planted.

This indicates the activation of microbiological processes in the soil, accelerated mineralization of organic substances, and their transition to a mobile form. As a result, the process of plant nutrition improves, positively affects the quantity and quality of the harvest.

In general, the improvement of the biological process in the soil is important for the cultivation of ecologically clean products.

Based on the data obtained in our experiment, the data on the influence of previous crops on the microbiological activity of the soil are presented in appendices 29-31.

In our experiment, before previous crops, the number of fungi in the 0-30 and 30-50 cm layers of the soil was 36.4-22.2 thousand/g, while in the version where mush was the predecessor, according to the soil layers, it was 43 ,6-28,8 thousand/g, corn 33,5-21,4 thousand/g, peanut 37,0-25,1 thousand/g, mosh 34.2-22.4 thousand/g, rapeseed 35.6-23.0 thousand/g before sowing.

In our experiment, it was found that the number of fungi in the soil sampled layers increased significantly after previous crops. As a result of the fact that the number of fungi in the 0-30 and 30-50 cm layers of the soil did not increase significantly when the previous crop, corn, was planted, that is, as a result of the difficult decomposition of nutrients from the roots and stalk residues left behind, peanuts A sharp positive change in the number of fungi was observed due to the high amount of nutrients and easy decomposition of white, mosh, and rapeseed crops in the root and leguminous residues.

This condition was slightly higher in the 0-30 and 30-50 cm layers of the soil in the variant with peanut as predecessor compared to the variant in which fungi in the soil were predecessors of mash and rapeseed. Moss in winter wheat due to the presence of a large amount of clechatka substance under the influence of root and grain residues causes them to be difficult to break down by microorganisms. As a result, there will be no conditions for a sharp increase in the number of fungi.

In our experiments, the number of fungi in the winter wheat control option in the 0-30 and 30-50 cm layers of the soil was 38.9-25.1 thousand/g, while in the option with the predecessor of mush it was 50.8-36 ,3 thousand/g, respectively 50,0-35,5 thousand/g in corn, in peanut It was found that it was 68.1-54.6 thousand/g, 66.3-52.1 thousand/g in mash, 66.0-44.2 thousand/g after rapeseed.

Another important taxonomic group of microorganisms is actinomycetes. When samples were taken in the 0-30 and 30-50 cm layers of the soil, it was observed that the number of actinomycetes changed according to the types of previous crops.

There was no significant change in the number of actinomycetes in the layers sampled in the control winter wheat crop, from 29.3 to 17.6 million/g at the beginning, and 24.5 million/g in the control winter wheat crop. -18.2 mln/g was found to be available.

The number of actinomycetes was 35.8-21.1 million/g in the layers sampled before sowing of previous crops mash and corn, 31.4-21.6 million/g after mash, 29.6-17.5 million/g. g after corn is 32.8-22.7 million/g, and the predecessor crops are peanuts from 30.7-18.2 million/g to 58.7-38.6 million/g, in mash from 31.0-19.3 million/g to 54.4-36.2 million/g, in rapeseed from 30.4- It was observed that it increased from 18.7 million/g to 52.9-33.6 million/g.

Root and stem residues left in the soil by previous crops have a strong influence not only on the number of taxonomic groups of microorganisms, but also on their physiological groups.

Nitrofixers and nitrogen fixers from physiological groups of microorganisms were studied in our research. Nitrogen fixers are important in enriching the soil with nitrogen.

Nitrogen fixers were 23.5-17.3 mln/g in the 0-30 and 30-50 cm layers sampled in the winter wheat control variant in the initial periods, and 35-1-24.3 when winter wheat was planted again. million/g. Nitrogen fixers were 28.6-20.5 mln/g and 24.4-16.0 mln/g in the sampled layers before planting the previous crop mash and corn, and after the predecessors, i.e. 48.0-36.4 mln/g when mush is the predecessor, 50.2-39.0 when corn is the predecessor mln/g increased, it was observed to increase by 3-4 times under the influence of suitable predecessor crops, the predecessor crop was initially 24.2-15.4 mln/g in peanut lsa, 78.1-44.7 million/g after planting peanut as a predecessor, 23.8-16.3 million/g in mash and rape, 24.1-15.7 million/g, and 77.8-43.3 million/g, 71.4-41.6 million/g after mash and rapeseed as a pollinator.

Another physiological group of microorganisms is nitrifiers.

In our experiment, when samples of nitrifiers were taken from the 0-30 and 30-50 cm layers of the soil, in the control winter wheat before planting the predecessor crops, it was up to 48.3-46.6 thousand/g in the 0-30 cm layer, and 30-50 cm layer was found to be 37.0-34.1 thousand/g.

In the options where mash and corn are predecessors, 56.4-49.0 thousand/g in the 0-30 cm layer, 42.5-38.1 thousand/g in the 30-50 cm layer, before the predecessors. 65.6-64.8 thousand/g in the sampled 0-30 cm layer of the soil after mash and corn as a predecessor crop, 44.2-42.2 thousand/g was found in the 30-50 cm layer.

In our experiment, before planting peanuts and moss, the nitrifiers in the 0-30 cm layers of the soil were 49.2-49.8 thousand/g in the 0-30 cm layer, and 38.4-38.5 thousand/g in the 30-50 cm layer. lsa, 86.5-82.2 in the 0-30 cm layer after planting peanuts and mash as predecessors thousand/g, in the 30-50 cm layer is 62.8-60.7 thousand/g, depending on the amount of nutrients in the root and root residues as a result of planting peanuts and moss crops, microorganisms in the soil, i.e. it was observed that the amount of nitrifiers increases, 48.9 thousand/g in the 0-30 cm layer before rape, 38.0 thousand/g in the 30-50 cm layer, after planting the previous crop rape, the amount of nitrifiers in the 0-30 cm layer was 78.6 thousand/g, and in the 30-50 cm layer it was 44.2 thousand/g.

In conclusion, in fields freed from winter wheat, as a result of the previous crops of mung bean, corn, peanut, mung bean and rapeseed crops, they activate microbiological processes in the 0-30 cm and 30-50 cm layers of the soil, and as a result the growth of microorganisms increases and their number increases significantly. This condition affects the fertility of the soil, the amount of humus and the nutritional regime.

Table 1

Effect of previous crops on soil microbiological activity (2024 AD)

T/p	Experience options	Soil layer, cm	Before the predecessors					After the predecessors				
			Bacteria, per million/g of soil	Nitrogen fixers per million/g of soil	Nitrifiers per thousand /g of soil	Fungi per thousand /g of soil	Actino-mycetes per million/g of soil	Bacteria, per million/g of soil	Nitrogen fixers per million/g of soil	Nitrifiers per thousand /g of soil	Fungi per thousand /g of soil	Actino-mycetes per million/g of soil
1	Control	0-30	35,5	23,5	48,3	36,4	29,3	41,4	35,1	46,6	38,9	24,5
		30-50	23,2	17,3	37,0	22,2	17,6	26,2	24,3	34,1	25,1	18,2
2	Mosh	0-30	38,3	28,6	56,4	43,6	35,8	53,3	48,0	65,6	50,8	31,4
		30-50	28,4	20,5	42,5	28,8	21,1	28,4	36,4	44,2	36,3	21,6
3	Peanut	0-30	37,5	24,4	49,0	33,5	29,6	50,3	50,2	64,8	50,0	32,8
		30-50	25,5	16,0	38,1	21,4	17,5	33,1	39,0	42,2	35,5	22,7
4	Perco	0-30	34,7	24,2	49,2	37,0	30,7	76,8	78,1	86,5	68,1	58,7
		30-50	23,5	15,4	38,4	25,1	18,2	54,7	44,7	62,8	54,6	38,6
5	Rapeseed	0-30	36,8	23,8	49,8	34,2	31,0	70,0	77,8	82,2	66,3	54,4
		30-50	24,5	16,3	38,5	22,4	19,3	48,4	43,3	60,7	52,1	36,2
6	Perco+rapeseed +mustard+amaranth	0-30	35,4	24,1	48,9	35,6	30,4	72,5	71,4	78,6	66,0	52,9
		30-50	23,6	15,7	38,0	23,0	18,7	52,2	41,6	56,4	44,2	33,6

CONCLUSION

As a result of the planting of mush, peanut, perco, rapeseed, perco+amaranth+mustard crops in the areas freed from winter wheat, the microbiological processes are activated in the 0-30 cm and 30-50 cm layers of the soil, and as a result, the number of microorganisms is increased. increase, their number increases significantly. This condition affects the fertility of the soil, the amount of humus and the nutritional regime.

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