THE INFLUENCE OF EARLY VEGETABLES, RE-CROPS AND WINTER WHEAT ON THE MICROBIOLOGICAL PROPERTIES OF SOIL IN VEGETABLES-GRAIN CROP ROTATION SYSTEMS

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Влияние сказочных овощей, повторных посевов и осени на микробиологические свойства почвы в системах посев-зерно

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Annotation. It is important to study the degree and scope of the role of microorganisms in the soil through the exchange of agricultural crops. The role of microorganisms in the soil is invaluable in increasing soil fertility, the formation of humus, the transition to a state in which the plant can absorb the chemicals necessary for the plant.

Keywords: soil, fertility, microorganisms, microbiological properties, vegetables, secondary crops, winter wheat, crop rotation, nitrification, denitrification , oligotrophs, ammonoficators.

Аннотация. Важным вопросом является изучение масштабов и масштабов воздействия систем совместного выращивания сельскохозяйственных культур на деятельность микроорганизмов в почве. Роль микроорганизмов в почве для повышения плодородия почвы, образования гумуса, перехода необходимых растению химических веществ в состояние, которое растение может поглотить, несравнима.

Ключевые слова: почва, плодородие, микроорганизм, микробиологические свойства, овощ, повторная культура, осенний багдой, багдой, севооборот, нитрификация, денитрификация, олиготрофы, аммонификаторы.

Restoration and increase of soil fertility, introduction of science-based crop rotation systems in the enrichment of soil organic matter are gained by using of mineral and organic fertilizers effectively. The role of microorganisms in the soil is invaluable in increasing soil fertility, the formation of humus, the transition to a state in which the plant can absorb the chemicals necessary for the plant. From the complex organic compounds of nitrogen in the soil, various amino acids are formed under the influence of microorganisms, some of the amino acids are broken down as a result of the activity of microorganisms in the soil, and ammonia is released.

In the circulation of nitrogen in nature: ammonification, nitrification, denitrification and nitrogen fixation take part in a process.

Ammonification process: Plant and animal wastes contain large amounts of organic matter. Their conversion into minerals is important for the nourishment of plants with nitrogen. The process of decomposition of proteins is called ammonification because NH3 is formed. The decay process continues under aerobic and anaerobic 188 conditions, but accelerates under aerobic conditions. An example of a group of putrefactive microorganisms is a variety of bacteria. The process of decomposition of organic matter in the soil can vary depending on climatic conditions, soil sample and applied agronomic methods. For example, in the gray soils of Central Asia, ammonification proceeds very rapidly because the temperature is much higher and there is enough moisture in the spring. On the contrary, this process is very slow due to the low temperature in the northern regions. Decomposition of organic matter is also slower in black and chestnut soil zones. The optimum temperature for the decomposition of proteins should be 25-30 degrees, as well as sufficient moisture in the decomposed product.

Denitrification process. The denitrification process is the opposite of the nitrification process, in which the bound nitrogen is freely returned to the atmosphere. This process occurs directly and indirectly, as molecular nitrogen can be formed from nitrates as a result of extremely different processes. In direct denitrification, nitrates are returned due to the vital activity of a particular group of bacteria denitrifying, while in indirect denitrification, only nitric acid interacts with amino acids. This also results in the formation of molecular nitrogen. The process of direct denitrification occurs due to the vital activity of denitrifying bacteria, which are common in nature, mostly in soil, manure and water bodies: $4HNO_3 = 2H_2O + 5O_2 + 2N_2$

Var. №	Early vegetable crops	Secondary crops	Main crop
1	Potato (NPK 200:140:100 kg/ha)	No replanting (control)	Autumn wheat
2	Cabbage (NPK 150:105:75kg/ha)	No replanting (control)	Autumn wheat
3	Cucumber (NPK 150:105:75 kg/ha)	No replanting (control)	Autumn wheat
4	Carrot (NPK 200:140:100 kg/ha)	No replanting (control)	Autumn wheat
5	Potato (NPK 200:140:100 kg/ha)	Mung beans (NPK 60:90:60 kg/ha)	Autumn wheat
6	Cabbage (NPK 150:105:75 kg/ha)	Mung beans (NPK 60:90:60 kgr/ha)	Autumn wheat
7	Cucumber (NPK 150:105:75 kg/ha)	Mung beans (NPK 60:90:60 kg/ha)	Autumn wheat
8	Carrot (NPK 200:140:100 kg/ha)	Mung beans (NPK 60:90:60 kg/ha)	Autumn whea
9	Potatoe (NPK 200:140:100 kg/ha)	Soybeans (NPK 60:90:60 kg/ha)	Autumn whe
10	Cabbage (NPK 150:105:75kgr/ha)	Soybeans (NPK 60:90:60 kg/ha)	Autumn wheat
11	Cucumber (NPK 150:105:75 kg/ha)	Soybeans= (NPK 60:90:60 kg/ha)	Autumn wheat
12	Carrot (NPK 200:140:100 kg/ha)	Soybeans (NPK 60:90:60 kg/ha)	Autumn wheat
13	Potato (NPK 200:140:100 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Autumn wheat

14	Cabbage (NPK 150:105:75 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Autumn wheat
15	Cucumbers (NPK 150:105:75kg/ha)	Corn (NPK 200:140:100 kg/ha)	Autumn wheat
16	Carrot (NPK 200:140:100 kg/ha)	Corn (NPK 200:140:100 kg/ha)	Autumn wheat

Results of the research. In the conditions of light gray soils of Andijan region in farms specializing in cotton, grain and vegetable growing, short-term cropping systems are used to select crops that maintain and increase soil fertility, produce high quality crops and meet the food needs of the population. The soil of the experimental field is light gray, the mechanical composition is moderately sandy, irrigated from old, not saline, groundwater is 4-5 m below the surface. The amount of humus in the topsoil is 0.8-1.0%, total nitrogen is 0.079-0.081%. phosphorus 0.150-0.153%, bulk density 1.40-1.43 g / cm3.

Experiment 1 consisted of 16 variants, the total area of each variant was 240 m2 (length 50 m, width 4.8 m), of which the accounting area was 120 m2, carried out in 3 repetitions, the total area was 1.15 hectares.

Experiment 2 consisted of 12 options, the total area of each option was 240 m2, of which 120 m2 were taken into account, and the experiment was conducted in 3 repetitions, with a total area of 0.8 hectares.

1 EXPERIMENTAL SYSTEM

(Short-term (1: 1) vegetable-grain crop rotation system, 2015-2018)

Note: NPK 200: 140: 100 kg / ha of mineral fertilizers were used in winter wheat cultivation.

The research was conducted in the vegetable-grain and vegetable-cotton systems of short-term (1: 1) rotation, and both experimental systems were as follows: potatoes for the 1st background, cabbage for the 2nd background, cucumbers for the 3rd background and Carrots were planted on the 4th background. After the main crops were harvested, repeated shade, moss, and corn were planted in each agrophone. In 2016, according to preliminary data from Experiment 1, the number of microorganisms-oligotrophs converting carbon to humus in the experimental field was 3.14 million / g of KOE, the amount of

nitrogen-converting microorganisms-ammonifiers in the experimental field was 0.68. The ratio of oligotrophs to ammonifiers, ie carbon humus was found to have a pedotrophic index of 4.61, which determines the ratio of nitrogen to light-absorbing form.

According to the data obtained at the end of the application period of repeated crops, it can be observed that the microbiological process in the soil is accelerated. Indeed, it has been observed that the amount of all types of microorganisms in the soil has increased, except for denitrifier-type microorganisms. For example, in control variants 1, 2, 3, and 4 of the experiment, the amount of oligotrophs increased from 10.2 to 12.7 times, the amount of ammonifiers increased from 2.5 to 6.9 times, and the amount of oligonitrophils increased from 2.2 to 3.3 times.

The data show that the oligotrophic microorganisms, which rapidly decompose humus and cause wastage, are 18-20% more abundant in the control and corn cultivars than in the mung beans and soybean cultivars, while the amount of ammonifiers is 35-40%, the amount of oligonitrophils that accumulate organic compounds was found to be 20-25% less. In the experiment, it was found that the amount of denitrifier microorganisms that cause nitrogen loss in the soil in the gaseous state decreased by 1.4-1.9 times compared to the initial amount in the control variants of the experiment, and by 6.9-17.8 times in the mung beans and shade cultivated variants. The same patterns were observed in the remaining years of the study. Similar data were obtained in the experiments conducted on vegetable-cotton rotation systems.

From the data obtained, it can be concluded that in vegetable-grain and vegetable-cotton crop rotation systems, the amount of oligonitrophilic microorganisms increases by 20-25% compared to control when cultivating mung beans and soybeans after early vegetable potatoes and cucumbers, which increases the amount of carbon-containing organic compounds. In general, the planting of legumes and soybeans as a secondary crop creates a

favorable environment for microorganisms and a favorable environment for maintaining and increasing soil fertility. Due to the cultivation of these crops, the accumulation of nitrogen in the form of organic compounds and humus is reduced to a lesser extent. l Increased levels of nitrogen-assimilating bacteria, ammonifiers, and oligonitrophilic microorganisms lead to greater accumulation of carbon and nitrogenous organic matter.

Conclusions.

1. When planting mung beans and soybeans as a secondary crop after early potato and vegetable crops, the decomposition of humus and nitrogenous organic matter in the soil decreases due to a decrease in the number of oligotrophic and denitrafikator microorganisms in the soil and pedotrophic index. While it has been studied that it leads to the accumulation of more carbon and nitrogenous organic matter.

2. From the data obtained, it can be concluded that in vegetable-grain and vegetable-cotton crop rotation systems, the amount of oligonitrophilic microorganisms increases by 20-25% compared to control when cultivating mung beans and soybeans after early vegetable potatoes and cucumbers. In general, the cultivation of legumes and soybeans as a secondary crop creates positive conditions in maintaining and increasing the favorable environment for microorganisms and soil fertility.

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