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RESEARCH ARTICLE

Identification of the Influence on Increasing Productivity of Microbiological Biopreparations in Yield of Winter Wheat

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ABSTRACT

The article discusses an experiment conducted on weakly saline, irrigated gray-meadow soils of the southern part of Mirzachul. In the experiment, the effect of Azospirillum, Maxim, Biogumus, Microzyme-1, Rizokom-2, Novostil biopreparates on winter wheat yield was studied.

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Introduction

The prospects for the development of almost all regions of the Republic of Uzbekistan will be associated with high yields from agricultural products. It is known that fertilizers are used in increasing the yield of agricultural crops and improving the quality of products. But in some cases, the consumption of fertilizers introduced into the soil in farming can have a negative impact on the soil and agricultural crops due to the fact that there is a very improper inflorescence. This negative process is manifested when mineral and local fertilizers are used excessively, when sapropel is used without studying the chemical composition of household waste, and fertilizers containing heavy metals are introduced into the soil on a regular basis.

In particular, the stem of the cultivated plants is frail, the body lies without lifting the stem, in this case the yield of the crop is low, on the second hand the amount of various salts in the soil increases. Thirdly, the molecular nitrogen, which microorganisms accumulate as they receive, goes back into the atmosphere, before it begins to turn into an organic nitrogen compound. For example, if we give 100 kg of mineral nitrogen to the soil, then its equal half goes out into the air. This is a very large waste when fertilizing with mineral fertilizers. For example, if the plant absorbs a maximum of 15 percent, it absorbs mineral nitrogen. [1,7].This means that from 100 kg of nitrogen we use only 15 kilograms, but not more. In order to eliminate such a waste, many biopreparations are being created and offered by our scientists in order to reduce the cost of agriculture. These

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biopreparates differ from conventional mineral fertilizers in their low cost, slightly increase in yield, and the bacteria contained in them increase soil fertility and porosity, as well as increase soil fertility and porosity. [2,8].

In addition, pollution of the environment, deterioration of the ecological situation, the intensity of the soil salinity process adversely affects agricultural productivity. If we take only one salinity negatively affects the yield in the arid and semi-arid areas of the world, causing 1-3 percent of the soils to be out of agriculture every year. According to the data, about 47.5 percent of the irrigated lands in our republic are saline at different levels, of which less saline lands are 31.5 percent, on average saline lands are 12.1 percent and strongly saline areas are 2.1 percent. The main part of the irrigated land areas in the steppe region of the republic is prone to salinization, salinized areas of different sizes are 711 percent in the Republic of Karakalpakstan, 100 percent in Khorezm region, 85.8 percent in Bukhara region, 97 percent in Sirdarya region, 81.7 percent in Navoi region and 76.9 percent in Jizzakh region. [3].

With the application of microbiological biopreparates in restoring and increasing soil fertility, the humus status, agrochemical properties, biological activity of the soil, soil structure and density are improved, water and nutrient supply that can be assimilated are optimized, microbiological processes are improved, and soil fertility is increased. [4].

Object and methods of research. As the object of the study there was selected weakly saline, irrigated gray-meadow soils of the southern Mirzachul. The study objects were used in 3 pairs, the following - Azospirillum, Maxim, biohumus, Microzyme-1, Rizokom-2, Novostil biopreparations in the winter wheat variety Chillaki. Phenological observations were carried out to determine the effects of these biopreparates on plant growth and development, as well as their tolerance, yield and activity of beneficial microorganisms living together with plants on the biotic and abiotic effects of this variety were studied.

Microzyme-1 is the preparation, which is used in seed processing before planting cereals and legumes, and is also recommended for irrigation. From the ecological point of view, it is considered to improve seeds germination, increase growth, yield and quality. In addition to it, it activates the endogenic factors of seed germination and loses the microflories of the patogen in the seedatrophic;

Azospirillum - this specimen perfectly helps bacteria reach the roots of nitrogen in the plant, which increases the ability of the roots to retain water in themselves and makes a worthy contribution to the growth of the root system. One of the main important nutrients in soil fertility is nitrogen, which is one of the elements necessary for growing plants. In the external environment, nitrogen is of two forms: in the atmosphere, in the gaseous state and in the soil, in the drying of various organic and inorganic compounds. Mineral compounds of nitrogen make up 1-2% of the total nitrogen in the soil. The main part of nitrogen in the soil consists of organic compounds. Nitrogen contained in organic compounds in soils is easily assimilated by plants only after they are mineralized, that is, as a result of the influence of microorganisms, it becomes a mineral state in the form of ammonium and nitrate [5].

Biogumus is a popular, safe specimen of organic substances, which contains substances that enrich and improve the composition of the soil. In addition, soil humus is a stimulant of growth and development of plants. The biogumus regime is related to the amount of organic compounds that fall on the ground and their mineralization process.

The results obtained and their analysis. According to the results obtained, in the samples treated with biopreparates, the number of yield elements compared to the control was higher, and it was determined that the yield was significantly higher. The participation of microbial biopereparates has affected the growth, development and formation of crop structural elements in a variety of ways. On the basis of the technology of application of mineral fertilizers and biologically active preparations in the winter wheat, all sorts of sprouts of winter wheat planted on irrigated gray-meadow soils. (Table 1)

Table 1. The growth and development of winter wheat in the period of growing and development

No	Variants	Quantity of plants when full grassing, 1 m^2/p	Quantity of plants when full grassing, %	Quantity of plants in the period of collection, 1 m^2/ p (in spring)	Quantity of plants in the period of collection, %
1	Control-without fertilizer	305,2	59,3	199,1	57,3
2	$N_{180}P_{90}K_{60}$	312,7	59,7	226,6	60,2
3	Maxim +N_{180} P_{90} K_{60}	322,3	59,6	232,5	67,2
4	Azospirillum +N_{180} P_{90} K_{60}	328,7	63,5	244,7	71,5
5	Biohumus+N_{180} P_{90} K_{60}	326,8	63,4	238,5	69,8
6	Rizokom-2+N_{180} P_{90} K_{60}	329,2	69,2	242,7	70,2
7	Novostil+N_{180} P_{90} K_{60}	324,8	65,4	238,4	69,4
8	Microzym-1+N_{180} P_{90} K_{60}	329,5	70,9	243,6	70,7

The application of biopreparations was relatively low in the control variant, the rapid germination of the seed, especially in the case of the Microzym-1+N_{180} P_{90} K_{60} treated with 70,9% and was seen more clearly. Growth and development during the recovery period showed an upward

trend in the variant treated with Azospirillum +N_{180} P_{90} K_{60} (Table 1).

Table 2. Structural elements and yield of winter wheat harvest

No	Variants	Quantity of general stem in 1m², pc	Quantity of productive stems in 1m², pc	Weight of grains in one wheat ear, g	Yield of grain, c/ha
1	Control-without fertilizer	311,4	198,5	0,98	17,98
2	$N_{180}P_{90}K_{60}$	327,8	207,8	1,31	18,97
3	Maxim +N_{180} P_{90} K_{60}	345,4	221,6	1,33	21,09
4	Azospirillum +N_{180} P_{90} K_{60}	348,2	225,8	1,34	21,32
5	Biohumus+N_{180} P_{90} K_{60}	365,9	228,4	1,32	22,36
6	Rizokom 2+N_{180} P_{90} K_{60}	372,3	268,6	1,35	23,45
7	Novostil+N_{180} P_{90} K_{60}	357,7	232,6	1,29	22,14
8	Microzym-1+N_{180} P_{90} K_{60}	369,9	266,8	1,34	22,39

Further are given the results of the effect of biopreparates on the winter wheat. According to the results obtained, in the samples treated with bio substrates, the number of elements generated compared to the control was more, while the total number of stems accounted for 311,4 in the control variant, we can see the higher result in the variant treated with Rizokom-2+$N_{180}P_{90}K_{60}$, that is, it was 372,3. Including the number of fertile stems, the weight of grains in the spike, grain yield gave a higher result than others in this sample (Table 2). With regard to control, we can see that the productivity increased to 2 c/ha, while the Rizokom-2+$N_{180}P_{90}K_{60}$ biosubstrate was used, the Microzyme-1+N_{180} P_{90} K_{60} to 4,41 c/ha. And this is due to the fact that the micro-organism has a high influence on the yield of winter wheat. Conducted observations, analyzes and results confirm our opinion.

Conclusion

In addition to the plant-stimulating property of biosubstrates, there are a number of other important properties. In particular, they provide flexibility of plants to various unfavorable conditions and increase their immunity, protect them from various fungal and bacterial pathogens. The advantage of biopreparates over other chemical pesticides and fertilizers is that they have a high efficiency and complex effect.

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