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INFLUENCE OF DIFFERENT FOREIGNERS ON THE YIELD OF SOY VARIETIES IN IRRIGATED LANDS OF UZBEKISTAN

The effect of various inoculants on the productivity of soybean varieties on irrigated lands of Uzbekistan

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Annotation. The article presents the results of experiments on irrigated lands to identify the effectiveness of various strains of inoculants on soybean varieties in the conditions of meadow-serazem soils.

Keywords: soy, varieties, inoculants, strains, туганак bacterias, irrigated, soil, efficiency.

Relevance of the topic. Currently, the nitrogen utilization rate by plants is quite low: of the total amount of this nutrient element introduced into the soil, plants consume no more than 40-50%, the rest is transformed into gaseous compounds, eroded into the atmosphere or washed out of the soil and pollutes water bodies. These losses increase with the introduction of increased doses of nitrogen fertilizers and can cause serious environmental danger, which negatively affects people's health. In addition, the industrial synthesis of nitrogen fertilizers requires high costs of imported and non-renewable energy resources. This leads to a significant increase in the cost of the final product, because of all energy costs for agricultural needs, about 30% is the production of chemical nitrogen fertilizers (1).

Awareness of this, makes today to reconsider the ratio of the use of chemical and biological nitrogen in favor of the latter. So biological nitrogen fixation is the only way to provide plants with nitrogen, which not only does not affect the ecology of the environment, but also can significantly reduce the cost of energy and raw materials for the production of mineral nitrogen fertilizers. Thus, an increase in the share of biological nitrogen contributes to a decrease in the technogenic load on the environment, and to a reduction in energy consumption for the production of agricultural products. Biological nitrogen is widely used not only in the system of intensive technologies, but also in technologies that provide for the production of environmentally friendly crop products (organic farming). Since the use of mineral fertilizers in this case is unacceptable, the biological

nitrogen, which is fixed by nodule bacteria, is, in fact, the only and main source of obtaining cost-effective, environmentally friendly crops. (1,5,7).

In scientific experiments conducted in various soil and climatic conditions of Uzbekistan, it was noted that as a result of the use of nodule bacteria (inoculants), a yield increase of 3 to 11 centners of grain per hectare was obtained. It was noted that the effectiveness of nodule bacteria (inoculants) in rainfed lands is relatively lower compared to irrigated lands and gray earth soils with a low humus content lower compared to chernozem soils with high

the content of organic substances and humus (1; 2; 3; 4; 5; 6; 7).

The technique of experience. Experience area: Samarkand region, Aqdarya district "Кумушкент Ҳумо-куши" farm field. (No control inoculant was used).

Areas of practice: Republic of Uzbekistan Included in the state register of soy Nafis (Rice Research Institute, Uzbekistan) and SELETKA-302 (СОКО, Russia) varieties.

Forms of bacterial preparations used:

1. Nitroforte–Ж (Russian Federation)- liquid;
2. Nitroforte–П (Russian Federation)- powder;
3. Ризовит-АКС (Republic of Kazakhstan)- milk colored powder;
4. *Bradyrhizobium japonica* bacterial strain (Uzbekistan)- dark creamy liquid (bacterial titer 2×10^6);
5. Planted in the shade for 5 years as a control and *Bradyrhizobium j aponica* Rice Research Institute of Uzbekistan, where there is a population of bacteria soil-dark gray, talc-like, brought from the territory;
6. As a background, experimental soil without bacterial preparations was used ($P_{90}K_{60}$-Fon).

In many different regions, as a result of scientific experiments conducted in soil-climatic conditions, it was noted that the use of whole bacteria (inoculants) resulted in an additional grain yield of 3 to 11 ts per 1 ha of sown area. The effectiveness of complete bacterial preparations in organic soils rich in humus-rich black soils is lower than in gray soils with low humus content, compared to irrigated lands in dry lands, according to the literature.

Experimental methodology. The soils of the experimental area are meadow-gray, with high carbonate content, the aqueous absorption medium of the soil is neutral and weakly alkaline - PN = 7.1 - 7.4.

The amount of humus in the soils of the experimental field was 1.20, respectively, in layers of 0-30 and 30-

60 cm; 0.79; total nitrogen 0.12; 0.06; total phosphorus 0.24; 0.17; total potassium 2.27; 2.16%, mobile phosphorus 4.6; 17.6; exchangeable potassium 209-187 mg / kg. Soil absorption capacity is 13.4 - 13.6 mg. eq / 100 g in the soil. The mechanical composition of the experimental field soils is moderately sandy.

In the experiment with pre-sowing soybean seeds with drugs according to the methodology and *Bradyrhizobium japonica* The bacterial population was treated (inoculated) by mixing the existing soil with water in a 1: 2 ratio. Treatment of soybean seeds with inoculants was carried out indoors, out of direct sunlight. Inoculated seeds were planted in rows, spaced 60 cm apart, protected from sunlight. Seed sowing rate - 500 thousand seeds / ha, Seeding depth - 4-5 cm. Sowing time is April 15, 2019, at 6 p.m. Past cotton. Planting was carried out using a seeder SPCh-6M (Romanian pneumatic). Soil moisture was captured during the growing season at 70% of the soil's limited field moisture capacity (ChDNS). Shade cultivation was carried out according to the agro-techniques adopted in the region.

The following options were studied in the experiment: 1. Control - ($P_{90}K_{60}$-fon, no inoculant was used); 2.Fon+Nitroforte–Ж; 3.Fon+Nitroforte-П; 4.Fon+Ризовит-АКС; 5.Fon+ *Bradyrhizobium japonica* bacterial strain; 6.Fon+ *Bradyrhizobium japonica* The soil in which there is a population of bacteria.

The results of the experiment. Experimental results, Control - ($P_{90}K_{60}$-Fon, no inoculant was used) relative to the option Nitroforte–Ж, Nitroforte-П showed that in the variants used, the height of the plants was 32 and 25 cm higher, respectively. In other variants, the height of the plants was found to be lower than the above-mentioned Nitroforte-J, Nitroforte-P. It was noted that in the variants using the complete bacterial preparations Nitroforte-J, Nitroforte-P, the number of pods per plant and grain mass was higher than in the control and other variants.

In the root system of soybean plant Nitroforte-J, Nitroforte-P, the number of tubers per plant was 102 and 87, respectively, and the number of tubers in the soil with soybean seeds was 43. A similar pattern was observed for the Selekta-302 variety. In Selekta-302, it was found that the number of tufts in a single plant root was lower than in Nafis navigator.

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Influence of bacterial preparations used in soybean crop on plant yield structure and yield

Inoculants	Plant height, cm	Number of pods per 1 plant, pcs	Grain mass per 1 plant, g	Number of stems per 1 plant, pcs	Productivity, sr / ga	Additional yield at the expense of inoculants	
						Sr/ga	%
Type of soy nafis							
Control - (background P90 K60, no inoculants)	120	76.6	39.1	-	16.5	-	-
Fon + Nitroforte–Ж	152	202.5	103.2	102	25.8	9.3	56.3
Fon + Nitroforte – P	145	198.3	102.4	87	24.2	7.7	46.6
Fon + Rizovit–AKC	136	77.1	39.2	-	16.7	-	-
Fon + *Bradyrhizobium japonica* bacterial strain	135	76.7	39.1	-	15.9	-	-
Fon + *Bradyrhizobium japonica* soil in which a population of bacteria is present	142	151.3	58.8	43	21.3	4.8	29.0
Type of Soy seletka-302							
Control- (P90K60-Background, no inoculant used)	90.4	63.8	32.5	-	14,3	-	-
Fon + Nitroforte–Ж	145.7	192.5	98.1	97	21.6	7.1	49.6
Fon + Nitroforte–П	140.6	189.6	96.6	76	20.9	6.6	46.1
Fon + Rizovit–AKC	110,5	64.9	33.5	-	12,4	-	-
Fon + *Bradyrhizobium japonica* bacterial strain	112,2	63.8	32.5	-	13,1	-	-
Fon +	130.6	138.2	70.7	40	18.2	3.9	27.2

Bradyrhizobium japonica soil in which a population of bacteria is present							

The highest grain yield was 25.8 sr/ga in the variant using Fon + Nitroforte – J of the Nafis variety, and 9.3 sr / ga more (56.3%) than in the control variant. In Selekta-302, the highest yield was 26.6 sr/ga when using Fon + Nitroforte – J, and the additional yield was 7.1 sr/ga (49.6%).

In plants using Control-(P90K60-Background, no inoculants), Background + Rhizovit-AKS, Background + Rhizoazot, it was observed that the tubers were not formed in the roots of soybean varieties. It was found that the number of buds in soil-treated seed pods with background populations of Fon + Bradyrhizobium japonica was 59 and 44 less in Nafis variety and 57 and 36 in Selekta-302 variety than in Nitroforte-J and Nitroforte-P seedlings, respectively.

Conclusions

1. When using Nitroforte-J, Nitroforte-P, Nafis and Selekta-302 varieties were found to be tall, with the highest number of pods and grain mass per plant, with additional yields of 9.3 and 7.1 sr/ ga, respectively.
2. It was noted that the number of tufts in a single plant root is highest when using Nitroforte-J, Nitroforte-P.

3. Decrease in the number of tufts per plant from soil-treated seeds with a population of background + Bradyrhizobium japonica bacteria 1.5 - 2 times less than in plants from Nitroforte-J, Nitroforte-P, control, Rizovit-AKS, Rizoazot-treated plants bacteria were not formed.

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