The influence of planting schemes, norms and inoculants on the yield of new soybean varieties

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Abstract. In this article, data about the new native variety of Nafis and variety of Selekt-302 is described which was brought from Krasnodar region of the Russian Federation in the conditions of irrigated meadow-gray soils of Samarkand region, seed germination in field conditions, storage, growth, development, productivity, yield composition, the optimal planting schemes, norms have been identified and recommended for implementation. In the second experiment, in the conditions of irrigated meadow-gray soils, local Nafis variety and Selekt-302 variety of Krasnodar regions included in the State Register, imported strains of Bradyrhizobium japonica endogenous bacteria produced in our republic and aboriginal populations bacterium present in local soil. The results of the study on the effect of inoculants studied and their effect on plant development, the number and weight dynamics of stems formed in plant roots, crop structure, yield, weight of 1000 seeds, as well as their effectiveness are described.

1. Introduction
In today's world agricultural practice, soybean, one of the legumes, plays an important role in increasing soil fertility and meeting the needs of the population for food and livestock protein, because soybeans contain large amounts of protein, balanced essential amino acids and vegetable oil [1]. The protein uptake in soybeans is 30–45% with essential amino acids and 15–22% oil [1, 2]. Among legumes, soybeans rank first in terms of gross grain yield and crop area. Currently, soybeans are grown on more than 120 million hectares in world agriculture. Local demand for soybean for feed and food is driving an increase in its acreage in Uzbekistan. In the Republic of Uzbekistan, soybeans were planted on 10,000 hectares in 2017 and 20,000 hectares in 2020 on irrigated lands. A local soybean production can be further increased by enlarging its growing area and by enhancing the yield per area through optimized and updated agricultural technologies. Temperature, solar radiation and precipitation are important parameters that cannot be modified [3]. Optimization of soybean cultivation technology is therefore a dominant option for stabilizing and increasing yields. Seeding time, seeding methods, and seeding density are essential for crop development and also provide the foundation for a high yield production [4]. The following issues in agriculture, such as increase grain production, vegetable protein deficiency, and increase soil fertility, are solved by planting soybeans on irrigated lands in the Republic of Uzbekistan. However, most soybean farms in the country today do not fully use the potential yield of soybean varieties, one of the reasons for which the main technological elements of soybean cultivation technology are not taken into account planting schemes and norms, biological characteristics of
varieties, soil and climatic conditions, low-nitrogen fertilizers are not used, or high-yield bacteria are not used at all. In view of the above, we have identified a new strain of bacterium and imported strains created at the Institute of Microbiology of the Academy of Sciences of Uzbekistan in the conditions of meadow gray soils in Akdarya district of Samarkand region, to determine the effectiveness of existing aboriginal local populations experiments were performed on the cross section. According to Smirnova (1962) [5], the amount of protein in the grain varies depending on the type and varieties of legumes and the timing and norm of sowing, so the creation of high-protein varieties, the development of maintenance agro-technics in accordance with the climatic conditions is required. According to Shadieva and Saimnazarov (2017) [6], the sowing rate of soybean is determined by the size of its seeds and the rapid ripening of the variety. Abundant and high-quality yields from soybean largely depend on the timely sowing of seeds at optimal times and the use of quality seeds. According to Umarova (2009) [7], the number of tubers in the roots decreased with the increase of sowing rates: in the Orzu variety the number of tubers in the root decreased from 115 to 92, in the Uzbek-2 variety from 145 to 118 and in the Uzbek-6 variety from 165 to 130. The weight of a tuber in a bush is also high when planted sparsely and decreased when planted thickly. Numerous experiments have been conducted to study the effect of inoculants on soybean yield. In particular, Atabaeva and Mamedov (2007) [8] noted that the role of soybean in increasing soil fertility is significant, due to the presence of root bacteria (Rhizobium Japonica) in the roots, enriching the soil with nitrogen and an average of 70-100 kg / ha of biological nitrogen per year leads to accumulation. Therefore, the root and root remnants of this crop are important in maintaining and increasing soil fertility. According to Islamova (2011) [9] the use of nitragin in combination with mineral fertilizers, i.e. in the variants P 90K60+nitragin and N 30P90K60+nitragin, provided the formation of the largest number of endogenous bacteria and an increase in yield by 3.3-5.4 c / ha. An increase in the amount of nitrogen led to a decrease or no formation of endogenous bacteria. It was observed that the yield increased only due to nitrogen fertilizers. According to Baranov et al. (2005) [10] when the seedling thickness is at a maximum of 500 thousand / ha, the number of leaves is 2.1-2.2 times less than when planted in a single plant 200 thousand / ha, but as the thickness of the seedlings increases per hectare, so does the overall leaf area. That is, when the thickness of the seedlings is increased, the number of leaves in all varieties on one bush decreases. In different study carried out by Korrea (2006) [11] increasing the number of bushes leads to a decrease in productivity and a decrease in yield per one bush plant. Due to the reduction in the number of bushes, the plant does not make full use of nutrients and moisture in the soil, as a result, even if the productivity of one plant increases, the yield decreases due to the decrease in the number of bushes per hectare. The author notes in his conclusion that increasing the seedling thickness of early-ripening Delta and Lira varieties from 400 thousand bushes to 600 thousand bushes increased yields by 6.4 and 6.9%. According to Siddikov et al. (2004) [12], due to the activity of soybean tuber bacteria, free nitrogen in the air is converted into biological nitrogen and accumulated in the soil, which improves the productivity of nitrogen with an average of 65-130 kg / ha per hectare. According to Saitkanova et al. (2010) [13], starting from the germination phase, the formation of nodules in the soybean root was observed every day. To do this, 5 plants were dug up by the roots. The formation of the first nodules took place ten days after the soybean seed had fully germinated. The formation of the largest number of nodules coincided with the phase of filling the pods. In Samarkand region, Medeya, Valyuta, Izumrud varieties of soybeans imported from Ukraine and Orzu varieties included in the State Register of the Republic of Uzbekistan were studied. N.Khalilov and B.Umrzakov were processed at the rate of 200 grams of seeds per hectare with M-8 strains of soybean, which brought from Agricultural University of Simferopol in their experiments. It was found that these plants accumulate 238.1 kg of biological nitrogen per hectare of crop field and 50% of it is absorbed by the plant [14]. The amount of nitrogen biologically fixed by the soybean crop and the amount of it assimilated by the plant and remaining in the soil by Posypanov (1991) [15], and Erisman et al. (2008) [16] studied in detail and developed a methodology. The aim of this research study was to analyze the influence of planting schemes, norms and inoculants on the yield of new soybean varieties. The obtained results may help to sow soybeans in the most appropriate way for homogeneous crop emergence and rapid development and thus provide all the
requirements for optimal crop development in the country, and this could also provide the basis for obtaining a higher seed yield and the growth of soybean production in the republic of Uzbekistan.

2. Materials and Methods

2.1. Soil and climatic conditions of the study

The experiments were conducted in the field of the farm "Kumushkent Humo-kushi" in the territory of Kumushkent MMTP, Akdarya district of Samarkand region. The soil of the experimental place is meadow-gray, with high carbonate content, the soil aquifer is weakly alkaline (pH=7.1-7.4). The amount of humus in the soils of the experimental field was 1.20,0.79%, in layers of 0-30 and 30-60 cm respectively; total nitrogen 0.12; 0.06%; total phosphorus 0.24; 0.17%; total potassium 2.27; 2.16%; mobile phosphorus 24.2; 17.6, exchangeable potassium 209; 187 mg / kg. The absorption capacity of the soil is 13.4 -13.6 mg equivalent / 100 g. The mechanical composition of the experimental field soils is moderately sandy.

The climatic conditions of Samarkand region are low rainfall and high amount of heat falling on the earth's surface through sunlight. Sunny days occur mainly in summer and autumn. It lasted 1 year a 100-120 kilo calories per 1 cm horizontal layer of topsoil falls heat energy. This is 8 billion per hectare during the growing season. Kilo calories be interpreted as photosynthetic active radiation is absorbed. Due to the fact that in the southern latitudes it stays horizontal in the afternoon, a large amount of solar energy and light falls on the territory of the region. The amount of radiation is 181 kilo calories cm^2 per year (15.6 billion kcal / ha FAR), and in some years it exceeds this figure.

The climate of Samarkand region is sharply continental, hot and dry, characterized by sharp fluctuations in temperature from season to season and day and night. Winters are much milder and warmer. The average temperature in January ranges from -0.4°C to 26.5°C in July.

In the hot season of the year, precipitation is almost non-existent. In autumn and winter, the weather is changeable and the main part of precipitation is observed. The average annual perennial temperature is 13.6°C, and the amount of precipitation is 367.6 mm.

In our experiment, soybean between rows were planted at 60, 90 cm dotted and 90x20-1 double rows and placed in 4 repetitions. The area to be taken into account is 50 m^2. Seed sowing norms, 450; 550; 650 thousand seeds per hectare, depth 4-5 cm. Sowing period is the second decade of April. Sowing date was past tense-cotton. Moisture in the soil during the soybean growth period was maintained at no less than 70% of the soil limited field moisture capacity (BDMC). Soybean cultivation was carried out according to the agro-techniques adopted in the region. The objects of the experiment were the local Nafis included in the State Register of Soybean and the varieties Selektas-302 imported from the Russian Federation.

2.2. Description of soybean varieties studied experimentally

Nafis variety. It is medium ripening, high yielding variety. The oil content in the seeds is 25.0-27.0%. Stem is vertical, 145-150 cm high, the height of the first pods above the ground is 12-14 cm. There are 2-4 seeds in each pod. Weight of 1000 seeds is 162-174 g. Growth period is 115-120 days with an average yield of 30.0-32.0 centner per hectare, suitable for machine growing.

Selektas-302 variety. It is medium-ripe, high-yielding variety. The oil content in the seeds is 21.0-23.0 percent. Stems erect is 120-150 cm high, the height of the first pods above the ground is 14-16 cm. There are 3 seeds in each pod. Weight of 1000 seeds is 170-190 g. The growth period is 115-117 days, the average yield is 29.5 quintals per hectare, the yield of the variety is 49.5-53.7 quintals per hectare, suitable for machine growing.
2.3. Methods
Field experiments were conducted in 2018, 2019, 2020 in the field of the farm "Kumushkent Humo-kushi" belonging to the territory of Kumushkent MMTP, Akdarya district of Samarkand region. The experiments were conducted in the field of the farm "Kumushkent Humo-kushi" in the territory of Kumushkent MMTP, Akdarya district of Samarkand region.

Table 1. Influence of sowing schemes, norms on productivity of new varieties of soybeans

| №  | Sowing schemes | Sowing norms, 1000 pieces/ha |
|----|----------------|-------------------------------|
| 1  | 60 cm          | 450                           |
|    |                | 550(st)                       |
|    |                | 650                           |
| 2  | 90 cm          | 450                           |
|    |                | 550                           |
|    |                | 650                           |
| 3  | 90x20-1        | 450                           |
|    |                | 550                           |
|    |                | 650                           |
| 4  | 60 cm          | 450                           |
|    |                | 550(st)                       |
|    |                | 650                           |
| 5  | 90 cm          | 450                           |
|    |                | 550                           |
|    |                | 650                           |
| 6  | 90x20-1        | 450                           |
|    |                | 550                           |
|    |                | 650                           |

Table 2. Preparations used in the experiment

| №  | Used preparations                                      | Quantity                        |
|----|--------------------------------------------------------|---------------------------------|
| 1  | Control-(P90K60-background), not used inoculants        |                                 |
| 2  | Background+Nitroforte-J                                | - 200 ml/ha                     |
| 3  | Background+Nitroforte-P                                | 200 gr/ha                       |
| 4  | Background+Rizovit-AKS                                 | 200 gr/ha                       |
| 5  | Background+Bradyrhizobium japonicum + Bacillus subtilis| 2.0 l/ha (titers, 22 mln/ml)    |
|    | BS-26                                                  |                                 |
| 6  | Bradyrhizobium japonica bacterial population 1 kg / ha of| 1 kg/ha                         |
|    | available soil                                          |                                 |

Objects of experiment was Nafis (Rice Research Institute, Uzbekistan) and Selekt-302 (SOKO, Russia) varieties of soybeans included in the State Register of the Republic of Uzbekistan.

Forms of bacterial preparations (inoculants) used:
1. Nitroforte-J (Russian Federation) - liquid;
2. Nitroforte-P (Russian Federation) - powder;
3. Rizovit-AKS (Republic of Kazakhstan) - milk powder;
4. Background + Bradyrhizobium japonicum + Bacillus subtilis BS-26 Soil (dark gray, talcum) brought from the territory of the Rice Research Institute (Uzbekistan) where soybean was planted for 5 years and where the population of Bradyrhizobium japonica bacteria is present;
5. Bacterial preparations were used as a background in the soil where the experiment was performed (P90K60-background).
Correct use of the preparation (according to the established norms and criteria): Consumption of inoculants used in the experiment is shown in Table 2.

3. Results and Discussion

Influence of different planting schemes and norms on the yield of soybean varieties is shown in Table 3. Our research shows that when sowing in the soybean row spacing of 60 cm, the sowing rate is local Nafis variety (155 g per 1000 seeds), the sowing rate is 450 thousand (70 kg / ha), 550 thousand / ha (85 kg), 650 thousand / ha (100.7 kg) seeds, Selekt-302 variety (163 g per 1000 seeds), sowing norms 73, respectively; 90; 106 kg.

Table 3. Changes in crop structure and yield depending on the planting scheme and norms of soybean varieties, (2018-2020)

| № | Sowing scheme | Sowing rate, thousand pieces / ha | Number of plants stored before harvest, pieces / ha | Plant height, cm | Number of pods per plant, piece | Grain mass per 1 plant, gr | Yield, c / ha | Additional yield due to sowing scheme c/ha | %     |
|---|---------------|----------------------------------|---------------------------------|-----------------|----------------|----------------|-------------|------------------------------------------|-------|
| 1 | 60 см         | 450                             | 487                             | 145.5           | 98.3          | 6.0            | 30.6        | -                                        | -     |
|    | 550(st)       | 487                             | 502                             | 154.1           | 84.6          | 5.0            | 32.2        | 1.6                                      | 5.2   |
|    | 650           | 502                             | 582                             | 149.2           | 99.4          | 5.4            | 25.5        | -                                        | -16.6 |
| 2 | 90 см         | 450                             | 398                             | 125.3           | 97.3          | 5.6            | 20.2        | -10.4                                   | -33.9 |
|    | 550           | 398                             | 490                             | 149.2           | 99.4          | 5.4            | 25.5        | -5.1                                     | -16.6 |
|    | 650           | 490                             | 581                             | 161.4           | 90            | 5.3            | 26.1        | -4.5                                     | -14.7 |
| 3 | 90x20-1       | 450                             | 399                             | 124.3           | 98.3          | 6.4            | 27.2        | -3.4                                     | -11.1 |
|    | 550           | 399                             | 492                             | 148.2           | 97.4          | 6.2            | 33.6        | 3.0                                      | 9.8   |
|    | 650           | 492                             | 588                             | 160.4           | 95            | 5.9            | 36.2        | 5.6                                      | 18.3  |

In our experiment, the seeds of soybean varieties germinated in 8–10 days. It was observed that the field germination of seeds was 1-2% higher when sowing in 90 cm and 90x20-1 schemes than when sowing in row spacing of 60 cm.
The development of the local Nafis variety from 1 to 3 days after the flowering-legume formation phase was observed in all variants compared to the Selekt-302 variety. In observations on plant growth dynamics, it was noted that with the increase in planting norms, the plant height in both varieties increased accordingly.

It was found that the average height of a plant in Nafis variety is 120.1 cm when sowing norms are 450 thousand / ha when sowing between rows is 60 cm, 154.1 cm when sowing 650 thousand seeds or 14 cm more than when sowing 450 thousand / ha. It was found that when sowing soybean seeds in double rows, the plant height was 5-6 cm lower in all sowing norms than when the row spacing was 60 cm and 90 cm. The height of the plant was 4-6 cm higher when the row spacing was increased from 60 cm to 90 cm, and when the row spacing was increased to 60 cm. A similar pattern was observed in the Selekt-302 variety, but in all planting norms and schemes in the Selekt-302 variety, the plant height was 2-10 cm lower than in the Nafis variety.

The number of pods per plant varied from 101.8 to 95, depending on the planting norms and schemes in the Nafis variety, from 88.2 to 90.4 in the Selekt-302 variety. With the increase of sowing norms, the number of pods per plant decreased when the row spacing was 60 cm and 90 cm, respectively. A similar pattern was observed when the soybean was planted in double rows. In the Nafis variety, these figures are when the number of pods per plant is 101.8 to 84.6 when planted at 60 cm. It was observed that 97.3 to 90 seedlings were planted at 90 cm row spacing. These figures were significantly higher when the row spacing was 60 and 90 cm when planted in double rows. In the Selekt-302 variety, these figures ranged from 88.2 to 98.3, respectively.

One of the most important indicators of the yield structure of soybean varieties was observed to decrease with increasing grain sowing norms per 1 plant. In the Nafis variety, this indicator is 6.5 g for sowing 450 thousand seeds / ha when between rows 60 cm, 6.0 g for sowing 550 thousand seeds / ha, 5.0 g for sowing 650 thousand seeds / ha, and 5.6, 5.4, 5.3 g for sowing 90 cm between rows, respectively. When planted in double rows, respectively 6.4; 6.2; 5.9 g. A similar pattern was observed in the Selekt-302 variety, which was slightly lower than the Nafis variety at 6.0; 5.9; 5.3 g, 60 cm between rows, 5.6; 5.4; 5.1 when planted at 90 cm, and it was noted to be 6.1; 5.8; 5.7 g when planted in double rows.

The results of the study the Nafis variety was obtained as a standard of 60 cm between rows of planting norms and scheme, which is still widely used in practice. Row spacing 60 cm, Yield at sowing rate 550 thousand seeds / ha of Nafis variety is 30.6 c / ha. Sowing rate is at 450 thousand seeds / ha, yield 22.5 c / ha or sowing rate 550 thousand seeds / ha is 8.1 c / ha (26.4%) decreased. When the sowing rate was increased to 650 thousand / ha, the yield was 32.2 c / ha, an increase of 1.6 c / ha compared to the standard option. When the row spacing was 90 cm and the sowing rate was 450,000 seeds / ha, the yield was 5.1 c / ha lower than the standard variant, when the sowing rate was 60 cm between rows. Yield relative to the standard at the sowing rate of 650 thousand seeds / ha is 4.5 c / ha (14.7%). In the double-row variant, the yield is 27.2 c / ha for sowing 550 thousand seeds / ha at a sowing rate of 450,000 seeds / ha, or 36.2 c / ha for sowing 650,000 seeds / ha for 3 c / ha or 5.6 c / ha much was harvested compared to the standard. In the case of double row sowing, the regularity of increasing the yield was observed when the sowing rate was increased from 450 thousand seeds / ha to 650 thousand seeds / ha.

The same patterns were observed in Selekt-302, but it was noted that Selekt-302 yielded 3.8 to 5.6 c / ha less than Nafis navi in all planting schemes and norms.

It was noted that the growing period of Selekt-302 is 6-9 days shorter than that of Nafis variety. The results of the analysis show that when the row spacing, which is currently widely used in production, is 60 cm, the sowing rate is 550 thousand seeds / ha (st), the planting rate is higher when the sowing rate is increased to 650 thousand seeds / ha.

It was noted that plant spacing was less observed when planting at 90 cm row spacing, as well as reduced soybean of plants when planted in double rows and efficient use of roots from the feeding area, but difficult to control weeds between 20 cm row spacing.

As a result of the effect of inoculants used in the study, the height of the plant was significantly increased compared to plants without P₉₀K₆₀-background, inoculants, and varied from 127.1 to 153.4 cm. in the Selekta-302 variety of soybean, these values were 117.3; 150.4 cm, respectively. Such
changes in the soybean crop were caused by the activity of bacteria in the tubers formed in the roots under the influence of inoculants.

As can be seen in Table 4, the number of pods per plant increased significantly under the influence of inoculants used, and their number ranged from 98.7 to 64.6 in the Nafis variety and from 97.1 to 63.6 in the Selekta-302 variety. It should be noted that due to the addition of 10 g of molybdenum to Rizovit-AKS 1, the number of pods increased from 4.5 to 5.5 in the Nafis variety and 4.5 in the Selekta-302 variety.

### Table 4. Impact of inoculants on the yield of soybean varieties, (2018-2020)

| Inoculants                                                                 | Plant height, cm | Number of pods per 1 plant, piece | Number of tubers per 1 plant, piece | Mass of tubers per 1 plant, gr | Yield, c/ha | Additional yield due to inoculation (in the pulse phase) |
|----------------------------------------------------------------------------|------------------|-----------------------------------|-------------------------------------|-------------------------------|------------|---------------------------------------------------------|
| Control– (P60K60-background, no inoculant used)                            | 119.1            | 64.6                              |                                    |                               | 22.1       | -                                                        |
| Background+Nitroforte-J                                                   | 153.4            | 98.7                              | 71                                  | 5.4                           | 36.5       | 14.4 65.1                                               |
| Background+Nitroforte-P                                                   | 148.3            | 92.4                              | 83                                  | 4.6                           | 35.7       | 13.6 61.5                                               |
| Background+Rizovit-AKS                                                   | 127.1            | 70.1                              | -                                   | -                             | 23.4       | 1.3 5.8                                                  |
| Background+Bradyrhizobium japonicum +Bacillus subtilis BS-26              | 141.6            | 90.7                              | 63                                  | 5.1                           | 34.1       | 12 54.2                                                  |
| Soil in which the population of background+Bradyrhizobium japonica bacteria is present | 144.5            | 91.3                              | 56                                  | 4.5                           | 32.6       | 10.5 47.5                                               |
| Nafis                                                                      |                  |                                   |                                     |                               |            |                                                         |
| Background+bradizobium japonicum+ Bacillus subtilis BS-26 soybean created in the Republic of Nafis variety 90.7 pieces per 1 plant or 26.1 pieces compared to control, respectively 89.7 in Selekta-302 variety; There were 26.1 more. When counting the number of stems per plant in the roots of soybean varieties in the budding phase in the variant using Background+Rizovit-AKS, it was noted that Nafis and Selekta-302 did not form tubers. When using Background+Nitroforte-I in the Nafis variety, 71 piece were formed on 1 plant and their weight was 5.4 g. In the background+Nitroforte-P, these numbers were 83 and 4.6 g.
In this case, although the number of nodules in the variant Background+Nitroforte-P was large, their weight was 0.8 g less than in the variant Background+Nitroforte-J. When using the inoculant Background+Bradyrhizobium japonicum+Bacillus subtilis BS-26, created in our country, it was found that on average 1 plant produces 63 nodules and weighs 5.4 g. Due to the size of the tubers, 0.3 g less than Background+Nitroforte-J was observed. In the Nafis variety, the soil in which Background+Bradyrhizobium japonicum bacterial population was present was 56 pieces per plant and their weight was 4.5 g. Similar patterns were observed in the Selekt-302 variety, but the rates were slightly lower than in the Nafis variety. Yield analysis shows that in the control variant of Nafis variety the grain yield was 22.1 c / ha, in Selekt-302 variety 19.2 c / ha. When using Background+Nitroforte-J, obtained the highest productivity of the yield was 36.5 c / ha and the additional yield compared to control was 14.4 c / ha (65.1%). Nitroforte-J inoculant showed a slight advantage over Nitroforte-P. Bradyrhizobium japonicum+Bacillus subtilis BS-26 strain created in the Republic had 3 indicators of efficiency, with a yield of 34.1 c / ha and an additional yield of 12.0 c / ha (54.2%). Similar patterns have been observed in the Selekt-302 variety, which has been proven to produce 10.5 to 9.4 t / ha of additional grain per hectare, depending on the variety, even if no inoculants have been used in soybean fields for many years. However, it has been found that when new strains of inoculants are used in conjunction with annual planting, their effectiveness can be significantly increased.

5. Conclusions and Recommendations

1. The most common varieties of soybeans in the Republic of Uzbekistan Nafis and Selekt-302 in irrigated meadow-gray soils with row spacing 60; When sowing 90 and 20x20-1 cm in double rows, it was found that with the increase of sowing norms from 450 thousand to 650 thousand pieces per hectare, the plant height increases, the number and weight of grains per 1 plant increases.

2. When the soybean is planted in double rows, the plants form the highest grain yield due to the effective use of sunlight, feeding area by the plant. In practice, when sowing soybeans as the main crop, it was found that the yield of Nafis variety is 5.6 c / ha and Selekt-302 variety is 6.5 c / ha more than the standard varieties with double row spacing between 60 and 90 cm. The Nafis variety compared to Selekt-302 is proved to yield 3.8 to 5.6 c / ha more than the variety of Selekt-302.

3. In the conditions of irrigated meadow-gray soils of Zarafshan oasis, the highest yield was observed in Nafis and Selekt-302 varieties of soybean when comparing the effectiveness of different inoculants. When using Background+Nitroforte-J in Nafis variety, the yield was 36.5 t / ha, 14.4 t / ha compared to control variety. Selekt-302 yielded to 32.4; 13.2 c / ha respectively. The new inoculant Background+Bradyrhizobium japonicum+Bacillus subtilis BS-26, created in the Republic, recorded 3 indicators of efficiency, and the yield of Nafis variety was 34.1 c / ha, additional yield was 12 c / ha, Selekt-302 variety was reached to take 31.1, 11.9 c / ha respectively.

4. It was found that the use of inoculants for sowing significantly increases the yield, even when the presence of active endogenous bacteria in the soils where soybeans have been grown for many years.

5. In order to get the highest yield from soybeans, Nafis and Selekt-302 varieties should be sown on irrigated lands in double rows in the scheme 90x20-1 cm per hectare. It is recommended to work with BS-26.

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