Spectrum Journal of Innovation, Reforms and Development
Volume 15, May, 2023 | ISSN (E): 2751-1731
Website: www.sjird.journalspark.org

THE EFFECT OF STIMULANTS ON THE NUMBER OF BUSHES AND PRESERVATION LEVEL OF THE NAFIS VARIETY OF SOYBEAN

Usmonova Shokhista Usman kizi1,
Atabaeva Halima Nazarovna2,
Khayrullaev Sardor Shamsiddin ugli3
1PhD student, Scientific Research Institute of Rice, Uzbekistan
2professor, Tashkent State Agrarian University, Uzbekistan
3PhD student, Tashkent State Agrarian University, Uzbekistan

ABSTRACT:
This article presents information on the influence of methods of applying stimulants on the number of stems of soybean "Nafis". According to him, the application of stimulants to plants increases their resistance to abiotic factors. All the stimulators in the experiment showed their effect for the preservation of the plant, and the foliar feeding variant of the fulvogummat stimulator showed a better result than the other stimulators.

Keywords: agrotechnics, growth, development, stimulants, basis of fertilizers, plant number and level of preservation.

Introduction

Soybean plant is a very important plant in the world today. It is grown in more than 60 areas of the world. Soy is the leading crop among legumes. Today, when there is a protein shortage all over the world, the protein content of soybeans, the presence of all the amino acids useful for humans in the protein content, increases the nutritional value of soybeans even more. It is important to note that the advantage of soybeans is that they can be compared with a number of food products in terms of the richness of lysine, methionine, arginine, leucine and other essential amino acids. In many countries where soybeans are grown, this crop is the only source of protein, and it also provides livestock with nutritious food and increases its productivity. Soybean accounts for 40% of the world's gross vegetable oil production [2].

LITERATURE REVIEWS

In addition to the adopted cultivation technology, the application and study of stimulants that activate the plant's more active growth, development and crop formation remains a very relevant issue today.

this indicator can be increased under the influence of various stimulants and growth regulators, fertilizers, substances with various active effects. (Agafonov O.M. and Others) [1].

Currently, various complexes are being created at the industrial level, including mineral, micro-fertilizers, growth regulators, stimulants, and seed adhesives. This set of complex

substances is used in seed treatment. Seeds are saved when treated in this way. The use of a complex of growth regulators should ensure not only the productivity of the plant, but also its safety (Shapoval, 2015), [7].

The use of plant growth regulators in agriculture began in the 30s of the last century in the United States. The first widely used synthetic hormone was ethylene. Since then, synthetic substances imitating natural growth hormones have become an integral part of modern agriculture (Lovtsova), [4].

The development of the technology of using biostimulants for leguminous crops, which regulate growth and increase immunity, is of the most urgent importance. [6]

Achievements achieved in the experiments of "Aksayskaya Niva" LLC, Rostov Region, Aksay District. Treatment of soybean seeds with Gumimax drug had a positive effect on the reduction of wilting in soybeans, plant grains and grain yield. The results of the experiment show that the drug "Gumimax" increases the plant's resistance to existing discomforts. Note: pre-sowing seeds simultaneously with rhizorthorphin treatment of the plant allows to increase the productivity of soybean grain up to 0.3–0.4 tons. (Balakay G.T. and dr., 2008), [3]

Growth regulators have the ability to positively affect the yield and quality of soybean seeds. They increase the resistance of the plant to water, temperature and other adverse conditions. In order to achieve the maximum effect, seeds are obtained by step-by-step processing (Khokhoeva N.T), [8].

Ran O.P., Selikhova O.A., Tikhonchuk P.V. (2009) noted that when soybeans are grown in arid regions, they are not irrigated during the rainy season. In some regions, due to the effect of drought, the harvest is reduced, a lot of damage is seen. Damage from drought depends on the duration of the drought period, the period of plant development, evaporation and soil conditions. Water deficit (drying of the soil) is expressed by the closing of the leaf apices, the reduction of transpiration and photosynthesis [5].

Kh.N. Atabaeva., F.B. Namozov., A.A. Kurbanov and S.Sh. Khayrullaev in their experiments conducted in 2018-2020, when they applied micronutrients to the soybean crop, micronutrients affected the height of the soybean stem, leaf, root development, nodule formation, grain quality and productivity, and provided a high yield [10].

According to R. Jo'raeva., J. Toshpol'atov., A. Iminov., Kh. Bozorov and L. Zaynitdinova, S. Khatamov and S. Sh. Khayrullaev, in their experiments conducted in 2015-2017, soybean plant mineral fertilizers and belonging to the rhizobium group it was observed that the yield increased by 12.6-12.8 c/ha when exposed to azotobacteria strains compared to the control variant [11, 14].

According to Khayrullayev Sardor Shamsiddin ugli (2021), the application of micronutrients in the suspension method 2 times during the application period of soybean varieties in the conditions of meadow-swamp soils provides an increase in grain quality [16]. According to data of Atabayeva Khalima Nazarovna, Khayrullaev Sardor Shamsiddin o’g’li, and Usmonova Shohista Usmon qizi (2020), sulfur has a positive effect on the branching of soybean varieties on the background of mineral fertilizers, and in 2018 the number of branches in the variety "Orzu" increased by 0.8-1.3 compared to the control

option due to the micro element sulfur. In the "Nafis" variety, this figure was 0.3-0.4, and good results were obtained from medium and high sulfur standards. In 2019, these indicators increased by 0.3-0.7 in the variants of sulfur compared to the control in the "Orzu" variety, increased by 0.1-0.3 in the "Nafis" variety, and good results were obtained from the medium and high standards of sulfur [13]. According to Iminov Abduvali Abdumannobovich, Khayrullayev Sardor Shamsiddin ugli, et al, Nitragine treatment of soybean and mung bean seeds before sowing had a positive effect on seed germination under both laboratory and field conditions, the germination rate of seeds in the laboratory under the conditions of cotton cultivation in the following year under the background of non-treatment by nitragine before sowing the seeds of soybean and mung bean crops grown as a secondary crop after winter wheat was 0.3-1.3%, and field fertility was 0.2-0.8% higher. Also, it was found that the use of phosphorus and potassium fertilizers in soybean and mung bean crops grown as a secondary crop was 0.6-1.0% higher in the laboratory, and 0.6-0.7% higher in the field than in the control options without mineral fertilizers in studies [12]. According to Umarova Nigora Sadriddinovna, Bo'riboyev Bekzod Yetmish ugli, Khayrullayev Sardor Shamsiddin ugli, Usmonova Shokhista Usmon kizi, & Turdaliyeva Shokhista Tulkinjon kizi, the demand of the soybean plant for mineral fertilizers, it was observed that when NPK and liquid fertilizer were used together, all the biometric parameters and yields of the plant increased by varieties compared to other methods. The use of mineral fertilizers in different ways in typical sierozem soil conditions affects the grain yield of local and foreign varieties. In other words, the average yield of medium-ripe soybean varieties "Nafis" was 43.4 c / ha, "Vilana" was 42.4 c / ha, and the best way to increase the yield is to apply fertilizers as NPK in combination with liquid fertilizer [17]. According to data of Khayrullayev Sardor Shamsiddin o'g'li and Usmonova Shohista Usmon qizi, the location of the lower first pod in soybean varieties is 12.8-15.9 cm in Orzu variety, 3-3.1 cm in Radimax stimulator, 2.2-2.4 cm in Gummat stimulator, 2.1 cm in Tecamin stimulator and 3.1 cm in Algora stimulator was found to be high. The most effective results were observed in Radimax, Gummat and Algora bio-simulators, and the location of the lower first pod was detected 14.7-17.6 cm in the "Nafis" variety, which was 2.5-2.9 cm higher in the Radimax stimulator, 2.2-2.5 cm higher in the Gummat stimulator, 2.1 cm higher in the Tecamine stimulator, and 2.4 cm higher in the Algora stimulator than in the control variant. The most effective results were observed in Radimax, Gummat and Algora biosimulators [15]. According to Atabayeva, K. N., Umarova, N. S., Yakubov, S., & Khayrullaev, S. S, positive results were obtained from moderate levels of sulphur and manganese, and low levels of iron. Macro and micronutrients had a positive effect on soy yield. An additional 7.6 quintals (q)/ha was harvested in exchange for macro fertilizer. Compared to the background variant, the yield was 4.6-8.3 q/ha for sulphur and 4.9-9.8 q/ha for manganese. The yield of the iron element was lower than that of the background variant. Grain quality has changed in exchange for macro and micronutrients. In exchange for mineral fertilizers, this figure increased by 2.4%. In exchange for the element sulphur, the protein increased by 3.1-5.8%; an increase of 4.4-8.4% was observed in exchange for the element manganese. It was noted that the protein increased by 7.9-8.7% in exchange for the element iron [18]. According to Ugli

Khayrullayev, S. S., & Kizi Usmonova, S. U., mineral fertilizers and sulfur microelements activate the symbiotic activity of soybean variety "Orzu", averaging 32.4-42.3 million nodules per hectare, the number of nodules due to the background of mineral fertilizers increased by 13.6%, and there was an increase of 19.4-23,4% due to sulfur, as well as an average weight of nodules was 6.46-9.56 c / ha, the weight of nodules increased by 5.3% due to mineral fertilizers, and 17.1-32.4% due to sulfur. During the application period, 6.46-9.56 c / ha of nodules mass was accumulated per hectare according to the studied variants, which contributes to the increase of nitrogen and organic matter in the soil and a slight increase in biological efficiency [19]. According to Usmonova Sh.U, Khayrullaev S.Sh, Shomuqimov N.N, & Gaynanova A.F, the influence of stimulants on soybeans affected the weight of 1000 grains of Vilana cultivar, under the influence of Gummat stimulator this figure was 2.2-7.4 grams higher than on basis of mineral fertilizers (Background), and under the influence of Rival stimulator-3.0-6.0 grams [20]. According to Khayrullaev S. S, In the variant, where not used mineral fertilizers and micronutrients, the leaf area in the control variant of the Orzu variety of soybean was 51.1 thousand m^2 / ha. Under the influence of microelements, the leaf area of Orzu was 59.1-64.6 thousand m^2 / ha. The highest rates of exposure to micronutrients were observed with medium use of sulfur and manganese. Under influence macro and micro fertilizers, the leaf area of Orzu variety increased from 4.0 to 13.5 thousand m^2 / ha, or from 7.3 to 20.9% [21].

METHODS AND MATERIALS

Experiments are carried out in field and laboratory conditions. In the research "Methods of conducting field experiments" (T.UzPITI 2007), "Methodology of field experiment (B.Dospekhov, 1985), “Methodology of the State variety testing of agricultural crops” (1985, 1989), “Methods of agrochemical, agrophysical studies of the soil of Central Asia” (1988) methods are used.

Nafis variety. The variety was created by the method of individual selection at the Rice Research Institute of Uzbekistan.

The growing period is 115-120 days. The height of the plant is 145-150 cm. The location of the lower pod is 14-16 cm, the number of branches is 2-4, the number of pods in one plant is 120-130, the number of grains in one pod is 2-4.

Grain quality and technological parameters: weight of 1000 seeds is 165-175 g. The protein content of grain is 40-41%, the oil content is 25-27%. Resistant to lodging, shedding, diseases and mechanized harvesting.

Yield: 30-32 c/ha grain yield and 250-300 c/ha blue mass can be obtained from the variety under favorable conditions.

Place of experiment, conditions and agrotechnical measures

The experiments were conducted in the scientific experimental fields of the Rice Research Institute in Tashkent region.

The soil layers are swamp type soils characteristic of an oasis. There are also large and small stones and sand mixtures in different depth layers. These soils derive from the typical excess moisture conditions of the left bank of the river and are ideal for rice cultivation. The soil is grassland. The soil of the experimental field is not saline, the Khaydov layer is 30- 40 см. The pH of the solutions in the soil is 6.8-7.3 units, and it is heavy clay according to its mechanical composition. Experiments are being conducted in 4 checks of 12 cards.

Prior to planting, the background was established in the program, in which 50 kg of nitrogen, 100 kg of phosphorus and 70 kg of potassium were applied. Planting method is wide rows, row spacing is 70 cm, bush spacing is 5 cm. Nitragin was not used because soybeans are always grown at the Rice Institute and the soil contains Rhizobium bacteria.

The experimental field was irrigated 2 times during the period of operation. Cultivation was carried out 2 times in the experimental field with the help of equipment. Soy varieties were fed in 3 different ways, suspension was used.

RESULTS AND DISCUSSION

Soybean yield depends on the number of bush of plant. The "Nafis" variety is a medium-sized variety, and its optimal planting rate was found to be 400,000/ha in previous studies.

At the beginning of the praxis period, the annual population was 370.8-388.6 thousand bushes/ha, and the percentage of conservation was 92.7-97.2%. In the UZGUMI stimulator used in the experiment, the number of bushes at the beginning of the praxis period was 372.2-379.8 thousand bushes/ha, and the percentage of preservation was 93.1-94.9%. The variants using this stimulant increased by 6.4, 1.4, 9.0 thousand bush/ha, respectively, from the background variant. At the beginning of the stimulator of fulvogummat, the number of bushes was 381.2-388.6 thousand bushes/ha, and the percentage of preservation was 95.3-97.2%. The variants using this stimulant increased by 15.2, 10.4 and 17.8 thousand bush/ha, respectively, from the background variant, and this indicator is 4.0, 2.7, 4.6%. In Rival stimulator, at the beginning of the period of praxis, the number of bushes was 374.8-384.0 thousand bushes/ha, and the percentage of preservation was 93.7-96.0%. The variants using this stimulant increased by 8.8, 4.0, 13.2 thousand bush/ha, respectively, from the background variant. This means that the planting technology in the experiment was performed correctly and the seed quality was good.

Table 1 The number of bushes of soybean cultivar and preservation rate, average 2021-2022

No	Options	At the beginning of the praxis period		At the end of the praxsi period	
		number of bushes "Nafis"	%	number of bushes	%
1	Background ($N_{50}P_{100}K_{70}$)	370.8	92.7	333.0	89.3
2	Background+UZGUMI (seed treatment)	377.2	94.3	338.2	89.2
3	Background+UZGUMI (foliar feeding)	372.2	93.1	357.6	96.1

4	Background+UZGUMI (seed treatment+foliar feeding)	379.8	94.9	348.5	91.8
5	Background+Fulvogummat (seed treatment)	386.0	9 6.5	354.2	91.8
6	Background +Fulvogummat (foliar feeding)	381.2	95.3	378.7	99.4
7	Background+Fulvogummat (seed treatment+foliar feeding)	388.6	97.2	364.9	93.9
8	Background+Rival (seed treatment)	379.6	94.9	348.4	91.8
9	Background+Rival (foliar feeding)	374.8	93.7	369.9	98.7
10	Background+Rival (seed treatment+foliar feeding)	384.0	96.0	357.8	93.2

The yield depends on the number of bushes saved by the end of the period. By the end of the application period, the number of bushes in the soybean was 333.0-378.7 thousand bushes/ha, and the percentage of preservation compared to the number of plants at the beginning of the application period was 89.2-99.4%. In the background version, at the end of the praxis period, 333,000 plants/ha were planted. In the UZGUMI stimulator used in the experiment, the number of bushes at the end of the period was 338.2-357.6 thousand bushes/ha, and the percentage of preservation was 89.2-96.1%. The variants using this stimulant increased by 5.2, 24.6, 15.5 thousand bush/ha, respectively, from the background variant. At the end of the fulvogummat stimulator, the number of bushes was 354.2-378.7 thousand bushes/ha, and the percentage of preservation was 91.8-99.4%. The options using this stimulant increased by 21.2, 45.7, 31.9 thousand bushes/ha, respectively, from the background option, and this indicator is 6.0, 12.1, 8.8%. At the end of the period of use of the Rival stimulator, the number of bushes was 348.4-369.9 thousand bushes/ha, and the percentage of preservation was 91.8-98.7%. The variants using this stimulant increased by 15.4, 36.9, 24.8 thousand bush/ha, respectively, from the background variant. Among the variants, the foliar-fed variant of Fulvogummat stimulator had the best results (Table 1).

CONCLUSIONS

Application of stimulants to plants increases their resistance to abiotic factors. All the stimulators in the experiment showed their effect for the preservation of the plant, and the foliar feeding variant of the fulvogummat stimulator showed a better result than the other stimulators.

REFERENCES

1.Агафонов О.М. и др. Научные основы применения удобрений. Колос. 2015. с 11,187.
2.Б.Доспехов "Методика полевого опыта, 1985 й
3.Балакай Г.Т., Ивебор Лоуренс Уче и др. Масличные культуры, 2008

4.Ларина Р.Е., Лисова Р.В., Логинов О.Н., Ловцова. Особенности формирования урожая сои в условиях центральной зоны Нечерноземной зоны // Проблемы агрохимии и экологиии. 2018, № 4,С.27-33
5.Ран.О.П.,Селихова.О.А.,Тихончук.П.В. Применение биологических препарпатов в посевах сои // Достижения науки и техники АПК. 2009, №18.С.26-27
6.Сонин К.Е. Влияние препарата фуролан на формирование качества семян трёх сортов подсолнечника // Пищевая технология. – 2010. – №1. – С. 13–15.
7.Шаповал, Новицкая.Н.В., Щучка Р.В, Джелисюк.А.В. Урожайность сои в зависимости от элементов технологии на черноземах типичных лесостепи Украины // Вестник. Алтайский ГАУ, №5. серия 11. 2015
8.Хохоева Н.Т., Ран.О.П. Применение биологических препарпатов в посевах сои // Достижения науки и техники АПК. 2009, №18.С.26-27.
9.Якубжонов.О, С.Турсунов, Муқимов.З Дончилик Т. Янги аср авлоди 2009 234-бет
10.Nazarovna, AK, Bakhromovich, NF, Alavkhonovich KA, Ugli KSS. Effects of Sulfur and Manganese Micronutrients on the Yield of Soybean Varieties. *Agricultural Sciences*, 2020;11: 1048-1059. https://doi.org/10.4236/as.2020.1111068
11.JURAEVA R., TASHPULATOV J., IMINOV A., BOZOROV X., ZAYNITDINOVA L., & KUKANOVA S. (2020). EFFICIENCY OF SYMBIOTIC NITROGEN FIXATION OF SOY NODULE BACTERIA AFTER PRESERVATION. PLANT CELL BIOTECHNOLOGY AND MOLECULAR BIOLOGY, 21(61-62), 7279. Retrieved from https://www.ikprress.org/index.php/PCBMB/article/view/5644.
12.ABDUMANNOBOVICH, I. A., UGLI, K. S. S., ERGASHBOYEVNA, K. D., UGLI, H. S. R., & TURSINALIEVICH, K. S. (2021). EFFECTS OF NITRAGINE AND MINERAL FERTILIZER RATES USED ON REPEATED LEGUME CROPS ON SEED GERMINABILITY. PLANT CELL BIOTECHNOLOGY AND MALECULAR BIOLOGY, 22(35-36), 251-258. Retrieved from https://www.ikprress.org/index.php/PCBMB/article/view/6342.
13.Atabayeva Khalima Nazarovna1, Khayrullaev Sardor Shamsiddin o'g'li, and Usmonova Shohista Usmon qizi, "THE EFFECT OF SULPHUR ON THE BRANCHING OF SOYBEAN VARIETIES", *STJITT*, vol. 1, no. 2, pp. 4-6, Aug. 2020.
14.Iminov, A. A., Hatamov, S. R. O., & Khayrullaev, S. S. O. (2020). Effect Of Nitragine And Mineral Fertilizers On Soil Microbiological Properties In Planted As Secondary Legume Crops. *The American Journal of Agriculture and Biomedical Engineering*, *2*(08), 169-172. https://doi.org/10.37547/tajabe/Volume02Issue08-22
15.Khayrullayev Sardor Shamsiddin o'g'li and Usmonova Shhista Usmon qizi, "THE EFFECT OF STIMULATORS ON THE LOCATION OF THE FIRST POD OF SOYBEAN VARIETIES", STJITT, vol. 1, no. 2, pp. 7-9, Aug. 2020.
16.Khayrullayev Sardor Shamsiddinugli. Effect Of Sulfur And Manganese Micro Nutrients On Grain Quality Of Soybean Varieties. ACADEMICIA: An International Multidisciplinary Research Journal https://saarj.com. Vol. 11, Issue 3, March 2021. DOI: 10.5958/2249-7137.2021.00582.6. P.63-68.

17.Umarova Nigora Sadriddinovna, Bo'riboyev Bekzod Yetmish ugli, Khayrullayev Sardor Shamsiddin ugli, Usmonova Shokhista Usmon kizi, & Turdaliyeva Shokhista Tulkinjon kizi. (2021). EFFECT OF MINERAL FERTILIZERS ON MORPHOPHYSOLOGICAL CHARACTERISTICS OF LOCAL AND FOREIGN SOYBEAN VARIETIES. European Journal of Agricultural and Rural Education, 2(4), 39-42. Retrieved from https://scholarzest.com/index.php/ejare/article/view/611.
18.Atabayeva, K. N., Umarova, N. S., Yakubov, S., & Khayrullaev, S. S. (2021, December). Influence of trace elements on soybean yield in grassland-swamp soils. In *IOP Conference Series: Earth and Environmental Science* (Vol. 939, No. 1, p. 012049). IOP Publishing.
19.Ugli Khayrullayev, S. S., & Kizi Usmonova, S. U. (2021). Effect Of Sulfur Micronutrient On Symbiotic Activity Of "Orzu" Variety Of Soybean. *The American Journal of Agriculture and Biomedical Engineering*, *3*(05), 49–59. https://doi.org/10.37547/tajabe/Volume03Issue05-10
20.Usmonova Sh.U, Khayrullaev S.Sh, Shomuqimov N.N, & Gaynanova A.F. (2022). Effect Of Stimulators On Thousand Piece Grain Weight Of "Vilana" Cultivar Of Soybean. *Central Asian Journal of Theoretical and Applied Science*, *3*(4), 153-157. Retrieved from https://cajotas.centralasianstudies.org/index.php/CAJOTAS/article/view/467
21.Khayrullaev S. S. Influence of sufur and manganese micronutrients on formation of leaf area of "Orzu" cultivar of soybean //ISJ Theoretical & Applied Science, 03 (107). – 2022. – C. 287-191.