



## OPTIMIZATION OF RUSSIAN SOYBEAN VARIETIES IN CONDITIONS OF TYPICAL SIEROZEM SOILS

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Article history:	Abstract:
<p><b>Received:</b> 24<sup>th</sup> October 2021 <b>Accepted:</b> 24<sup>th</sup> November 2021 <b>Published:</b> 30<sup>th</sup> December 2021</p>	<p>The article provides data on the formation of the yield of Russian soybean varieties Slavia, Chara in repeated crops, and data about their biometric and phenological parameters: stem height, number of branches, number of pods, weight of pods, number of grains, weight of grain, weight of stems in comparison. In terms of biometric indicators, the soybean variety "Slavia" showed itself the best, relative to the variety "Chara" in all indicators. So the weight of the grain of the Slavia variety is 0.7 g higher than that of the Chara variety.</p>
<p><b>Keywords:</b> Soybean, Chara, Slavia, growth, development, phenology, yield, protein, oil, grain, optimization.</p>	

### INTRODUCTION

Soybean cultivation in Uzbekistan is currently not widely implemented in the structure of agriculture, although it has quite useful qualities such as a high content of dietary protein and oil. Various varieties of soybeans contain up to 50% dietary protein, 27% easily digestible polyunsaturated fatty oil and up to 30% carbohydrates (mainly mono- and disaccharides). Soybean contains vitamins and biologically active substances: A, B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>6</sub>, E, C, D, K, PP and others. And also trace elements: Mn, Mo, Mg, B, Fe. All of them are essential in our daily life and for the diet of animals.

Soybean is a very plastic crop, but demanding on moisture and soil looseness. Soybeans can be cultivated both in continuous and wide-row sowing, with sowing dates from early May to late June. Like any legume crop, soybeans enrich the soil with biological nitrogen and, in principle, is a good predecessor for cereals.

For a more intensive introduction of soybeans into production, we have set the task to determine the optimal elements of the technology for the cultivation of soybeans in stubble crops.

### OBJECT OF RESEARCH

The object of research is the soybean varieties Slavia and Chara, soil of experimental field of Tashkent State Agrarian University.

### LITERATURA REVIEW

X.N.Atabaeva, F.B.Namozov, A.A.Kurbanov and S.Sh.Khayrullayev (2020), in their experiments in 2018-2020, found that when micronutrients affected soybean crops, micronutrients affected stem height, leaf and root development, root nodule formation, grain quality and yield, and provided high yields [7].

According to R.Juraeva, J.Tashpulatov, A.Iminov, H.Bozorov, Khatamov S.R, Khayrullaev S.Sh and L.Zaynitdinova (2020), in their experiments in 2015-2017, mineral fertilizers and rhizobium were applied to soybeans. When exposed to strains of azotobacteria belonging to the group, it was observed that the yield increased by 12.6-12.8 c / ha compared to the control variant, [4; pp.72-79], [3; p.172].

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 [6].

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 [2].

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 ear 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 [1].

According to Umarova Nigora Sadridinovna, Bo'riboev 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 [8].

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 [5].

According to data of Kh.N.Atabayeva, N.S.Umarova, S.Yakubov, and S.Sh Khayrullaev, micronutrients on the basis of micronutrients prolonged the shelf life of the 'Orzu' variety by 4- 5 days for sulphur and 2-4 days for manganese; macro and micronutrients affected the growth of soybeans, the stems were higher by 4.45% due to macronutrients and 2.78-6.30% due to micronutrients [9].

**MATERIALS AND METHODS**

Field studies were carried out at the Experimental Station of the Tashkent State Agrarian University.

**Table 1**  
**Characteristics of the soil of the arable layer of the experimental place**

Nº	Indicators	Value
1.	Arable layer, cm	25
2.	Humus horizon, cm	50
3.	pH value saline	7
4.	Hydrolytic acidity mg. eq. per 100g. soil	0.7
5.	The amount of absorbed bases	6.6-7.0
6.	Absorption capacity mg/eq. per 100 g of soil	7.4-7.6
7.	Saturation percent with bases, %	88-90

The experimental station is located near Tashkent in the upper part of the Chirchik river in the Kibray district of the Tashkent region, at an altitude of 481 m above sea level. The experimental station has the following coordinates 41°2' north latitude and 38°31' east longitude. The relief of the site is uneven, slightly wavy, with a general slope towards the Salar Canal. Water from the Buz-suv canal was used for irrigation

**Before setting up the experiment, the content of nitrogen, phosphorus and potassium was determined in the experimental field.**

Soil is a complex system with fertility, that is, the ability of the soil cover to ensure the growth and productivity of plants - to produce crops.

Nowadays, it is difficult to imagine agriculture without the use of fertilizers;

Nitric acid salts are components of mineral fertilizers. Plants use nitrogen from salt to build body cells, create chlorophyll.

Phosphorus is a macronutrient contained in the form of a basic compound of nucleic acids in seed storage substances, which is used during seed germination. Lack of phosphorus limits the formation of RNA and reduces protein synthesis. With a lack of phosphorus, there is an accumulation of nitrogen compounds with a low molecular weight in plant tissues.

**Highly efficient potash fertilizers.** They are used on various soils, for all crops, for all methods of application. Potassium sulfate has a much more effective effect on the size of the crop and its quality if it is used in combination with higher fertilizers (nitrogen and phosphorus).

The soil of the experimental site belongs to typical sierozem soils of old irrigation, non-saline with a low content (along the soil horizons 0-30 and 30-50 cm) of humus 1.08-1.02%, nitrogen 0.08-0.07%, phosphorus 0, 14- 0.13%, potassium 1.33-1.30%. those. the supply of nutrients to the soil is low. The soil is characterized by weak structure, good water permeability with high capillarity.

**Table 2**  
**NPK content in the soil of the experimental field**

№	Horizon of the soil, cm	Gross content, %				Mobile forms, mg / kg		
		Humus	Nitrogen	Phosphorus	Potassium	N-NO <sub>3</sub>	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
1.	0-30	1,08	0,08	0,14	1,33	42,1	23,0	186,0
2.	30-50	1,02	0,07	0,13	1,30	38,9	21,0	162,0

**Mobile forms of mineral fertilizers mg / kg:**

N-NO<sub>3</sub>-42.1-38.9.-poor soil

P<sub>2</sub>O<sub>5</sub>-23.0-21.0-poor soil

K<sub>2</sub>O-186.0-162.0 is soil with average values. The supply of nutrients to the soil is low.

Groundwater occurs at a depth of 5-6 m. The reaction of the soil solution is slightly alkaline. Irrigation causes soil compaction. Another unfavorable is the tendency to form a soil crust after irrigation or precipitation. With the use of organic and mineral fertilizers and good agricultural technology, high yields of field crops can be obtained on these soils.

**Characteristics of soybean varieties**

**Slavia** - Highly productive early ripening soybean variety for grain cultivation. It is possible to cultivate the variety in repeated crops.

Seedlings can withstand short-term frosts down to minus 4.5-5.0<sup>0</sup> C. It has a very deep root system - the central root can go to a depth of 2.5 m. Resistant to downy mildew, stem cancer and ash rot, moderately resistant to lodging. Resistant to bean cracking. The main approbation signs are early maturation, tallness, gray pubescence of plants, white corolla of a flower, color of bean valves is light brown, seed coat is light yellow, matte, without pigmentation, scar is yellow. Plant height is 115-140 cm. Pod attachment height 14-16 cm. Seed protein content 40-41%. Oil content of seeds is 22-24%.

**Chara** - Highly productive early soybean variety for grain cultivation in the main crops. The growing season is 104 days. It is possible to cultivate the variety in repeated crops. Resistant to downy mildew and ash rot. The main approbation signs are gray pubescence of plants, violet corolla of a flower, color of bean valves is light brown, seed coat is yellow, pigmentation, seed scar is medium-sized, oval-elongated, weakly expressed, colored in the color of yellow seed coat, resistant to lodging and pods cracking when ripe. Plant height is 100-110 cm. Pod attachment height 13-15 cm. Seed protein content 40-41%. Oil content of seeds is 22-23%.

**RESULTS AND DISCUSSION**

In soybean varieties, branching is an important indicator, since these indicators affect the number of beans and grains, which improves yield indicators. In our experiment, branching in the Slavia soybean variety was 1.6 pieces, and in the Chara variety there are 1.5 pieces, therefore, the Slavia variety showed the best results for 0.1 pieces.

**Table 3**  
**Biometric indicators of foreign soybean varieties, 2021**

Nº	Varieties	Stem height, cm	Number of branches, pieces	Number of pods, pieces	Weight of pods, pieces	Number of grain, pieces	Weight of grain, g	Mass of stems, g
1	Slavia	74,2	1,6	47,5	23,0	104,5	15,5	55,0
2	Chara	72,7	1,5	46,2	22,1	93,6	14,8	44,0

The main indicator of research results is the yield of plants. In our studies, the grain yield was determined by the variants of the experiment. The number of pods in the Slavia variety was 47.5 pieces, and in the Chara variety - 46.2 pieces, the Slavia variety showed the best results by 1.3 pieces.

The weight of pods in the Slavia variety was 23.0 g, and in the Chara variety, 22.1 g, the Slavia soybean variety showed the best results by 0.9 g.

As a result of research, we have determined the biometric indicators of two foreign soybean varieties. In the experiment of 2021, in the Slavia soybean variety, the plant height was 74.2 cm, and in the Chara variety this figure was 72.7 cm. The Slavia variety gave the best indicators by 1.5 cm.

On average, a pod has three grains, but single-seeded pods are common. In our studies, the number of seeds for the variants of the experiment was 104.5 pieces for the Slavia variety, and 93.6 for the Chara variety, the Slavia variety gave the best performance by 10.9.

The data in the table show that the tested variety Slavia has established itself with the best results in relation to the variety Chara.

## CONCLUSIONS

In terms of biometric indicators, the soybean variety "Slavia" showed itself the best, relative to the variety "Chara" in all indicators. So the weight of the grain of the Slavia variety is 0.7 g higher than that of the Chara variety.

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