



Intensity Of Formation Of Pods Along The Layers In Soybean Varieties

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	Abstract Due to the high demand for food products made from soybeans in the world, sowing soybeans in Khorezm region on large areas will serve to satisfy the demand for soybean products of the population of the region and livestock. Without studying the morphological, physiological and other biological characteristics of soybean, it is impossible to obtain a high and high-quality harvest. Therefore, studying the morphology and physiology of this crop is one of the urgent problems. In 2019, soybean was cultivated as the main crop in the field with the drug Nitrofix and in three terms, in three repetitions, the variants were randomly placed and studied. Soybean Nafis st, Slekta-201, Selekt-302, Dostlik and Arletta, the rate of formation of pods in the main stem layers, sowing dates and seeds in the second decade of April treated with Nitrofix P preparation, from the accents planted at the end of the first and third days of soybean it was observed that the produced heads were significantly more than the pods on the stems. So, in the conditions of Khorezm region, it is recommended to treat soybean seeds with Nitrofix and plant them in the second and third ten days of April. CC License CC-BY-NC-SA 4.0
	Key words: shade; seed; term; Nitrofix P; main stem; layer

Introduction

The increasing status of soybean meal as a food, stem, and industrial waste from grain processing in the world as animal feed requires a high and quality yield from this crop.

Soy is a valuable plant for mankind, mainly rich in fat and protein. Grain contains an average of 37-42% protein, 19-22% fat and up to 30% carbohydrates. The green mass harvested during the podding period is rich in proteins and vitamins (16-18%) and is a very nutritious feed for livestock. The diversity of soybean products, the quality and nutritional value of foods prepared from it, as well as the ability to grow well in any soil-climate and various extreme conditions, are increasing the attention to soybean cultivation.

At the moment, the harvest from the existing soybean areas cannot fully satisfy the demand for soybean products due to the sudden increase in the world population.

Therefore, planting soybeans on large areas and growing grain is one of the urgent issues.

In order to obtain a high and quality harvest from soybeans, it is necessary to adapt its promising new varieties to the conditions, to develop and implement specific agro-measures for the maintenance of new varieties, as well as to study the morphobiological and physiological characteristics of new varieties.

The formation and formation of soybeans depends on the mechanical composition of the soil, the amount of organic matter in it, humidity, acidity or alkalinity, the type and amount of salts in the soil, soil temperature, water supply, the type, amount and duration of feeding fertilizers, weather temperature, humidity, Biological characteristics of the cultivated varieties, as well as the study of the effect of sowing dates and days on the growth, development and productivity of soybean plants in order to enrich the soil with natural nitrogen when sowing soybeans as a main and repeated crop, depending on the specific characteristics of the soil of the area where soybeans are planted and the effective temperature. Many studies have been conducted on One of the agro-measures aimed at increasing the formation of soybean pods and grain yield in agriculture is the correct selection of optimal seeding periods determined by natural conditions such as soil temperature and water regime. Soybean seeds planting, as well as other agro-measures used in maintenance, the biological characteristics of cultivated varieties should be inextricably linked with the natural conditions of the area.

Literature review

Soybean as the main crop should be planted at the end of April, beginning of May, and when it is planted as a repeat crop, it is recommended to sow the fields freed from winter wheat as early as possible with nitrogen, and the row spacing should be 60 cm, and the seeds should be buried 4-6 cm in the soil [2, 3] points out; [4, 5] showed that the germination of soybean seeds is uniform when the temperature of the soil layer where the seeds are located is 12-14°C, and the grass is strong, and 20-25°C is necessary during the formation of pods, 18-20°C during ripening, and the temperature is 10-13°C when the seeds stop filling, the leaves turn yellow, [1] when the temperature is +17-+18°C, flowering slows down, even if the flowers do not fully open, germination continues and the pods are fully formed, [6] too high and dry temperatures cause the fruits to dry early and the sugar content turns into starch causes of failure, as well as [1] the following four years of research; Soybean seeds harvested on April 30 yielded 26.1 tons, 4.8 tons when planted on April 20, and 2.0 tons when planted on April 25. found that exposure to any or all of the four stages of development, a unique genetic trait of a soybean plant, can significantly affect the time it takes for a soybean flower to fully develop and open.

In the conditions of Uzbekistan, the growing (vegetation) period of soybeans, the growing period of the varieties planted as a repeated crop is 91-110 days, and before planting the seeds, it is recommended to work with Rhizotrophin, Rhizobophyte, Nitragin or Rhizozot bacterial fertilizers [9].

According to [10], the soybean plant is moderately demanding on drought and humidity, and during the germination of seeds, it absorbs 130-160% of water compared to its own weight, after germination, irrigation is based on the biological characteristics of the varieties, 6 times irrigation in soils with deep gray and seepage water, 1 - 600-700 m³ in 2 irrigations, 950-1000 m³ in 3-6 irrigations, all in all, 5200 m³. yielded 24.8-30.3 t. [12] have noted that a serious lack of moisture leads to the shedding of flowers and pods [12] and that the water demand in soybean is the highest during the period of pod formation and grain ripening.

Soybean plant grows in different soil conditions and gives a high yield [13]; [14] in the conditions of medium and strong saline soils of the Syrdarya region, the variety of soybean "Favrit" completes the vegetation period and complete ripening of the grain, [15] and bicarbonate salts in the soil affect the development of the vegetative and generative organs of the soybean plant and lead to the prolongation of plant ontogeny. In bicarbonate-saline soils, low irrigation reduces the negative effects of salts on the soybean plant, which is characterized by the fact that the Bukuria variety of soybean, which has a special feature, was harvested in warm autumn years due to the ripening of pods even 135 days after sowing.

Since soybean is a legume plant, nitrogen-fixing bacteria in the soil enrich the soil with organic nitrogen by forming nodules on the roots that absorb nitrogen from the air. However, despite the accumulation of nitrogen in the roots of the soybean plant, it needs nitrogenous, phosphorous and potassium fertilizers in a certain amount and proportion during its ontogeny. Therefore, researchers have conducted many scientific studies on feeding soybeans with mineral substances, including [16], [17] 90 kg of phosphorus, 60 kg 9.5 and 13.4 ts. when feeding with potassium and 120 kg. of nitrogen; It was noted that the varieties "Selecta" and "Amigo" obtained 11.2 and 7.6 ts. higher yield compared to the control when 150 kg of nitrogen fertilizer was given; [18] In 2010, despite the dry weather in Kansas state, they obtained 0.74 t higher yield compared to the control by feeding soybeans with nitrogen fertilizer at 134 kg per hectare, and concluded that feeding soybeans with 134 kg pure nitrogen is the most effective rate for soybeans.

In its ontogeny, soybean needs not only macro but also micro fertilizers. For example, sulfur participates in the formation of chlorophyll, which controls the process of photosynthesis, and is absorbed in large amounts

during plant respiration. If there is not enough manganese, the formation of seeds in legumes will not take place. Therefore, in soy agrotechnics, if they emphasize that the grain yield will increase by 6.2-14.2 centners per hectare by foliar feeding with micro-fertilizers together with macro-mineral fertilizers, [19], [20] use macro-mineral fertilizers of 1.2 kg of sulfur per hectare in marshy meadow soils. when used in addition, compared to the control, they recorded a higher yield of 11.0-18.4 centners.

Soybean yield and productivity directly depend on the number of pods on the main stem and lateral branches and the number of seeds per pod, as well as biological characteristics of the cultivated soybean varieties, planting dates and many other factors (agrotechnical measures, natural soil and climatic conditions).

According to [21], the formation of soybeans and the crop is significantly affected by the height of the air temperature, due to the influence of hot temperature, the grains are smaller than usual and the surface of the seeds does not swell, the yield is less, and the yield and quality of the soybean stems grown from the seeds sown late in hot climate conditions are improved; [22] that the seeds of the "Universal" soybean variety germinated in 83 days when planted on March 20, 74 and 72 days when planted on April 20 and 30, respectively; [23] and that the varieties "Avanta", "Bara", "Amigo", "Arleta", "Sparta", "Selecta" ripen very quickly and the vegetation period is 83-100 days, the lower pods are located 12-14 cm above the surface of the earth, [24] and in his experiments, in the "Nafis" variety of soybean, the height of the location of pods to the first pod was 16.3-16.9 cm from the surface of the earth, and in this location, he emphasized the ease of harvesting with the help of mechanisms, if 50 kg of nitrogen, 100 kg of phosphorus per hectare and that when 139 kg of potassium was applied, the number of pods was 47 on average compared to the control, [25] and in his studies, the height of the pods from the ground was 18, 16, and 14 cm in Volgaradka 1, Kamizinskaya 136, and VNIIOZ 76 varieties, respectively; [26], in their scientific research on soybeans, studied the dependence of the formation of soybean pods on its growth area, and considered that it is appropriate to plant 50-60 seeds per 1 m² and 30 cm between the rows in a ribbon-like manner, and 60-70% of the soybeans planted in this form have less branching. location in the middle and upper part of the stem; According to [27], the appearance of the first flower in a soybean plant depends on four periods of development determined by air temperature and the duration of bright days; [28] and [6] discussed the development of soybean and divided it into the phases of seed germination, the formation of the first three leaves, branching and tillering, flowering, podding and pod ripening; found that when the conditions are favorable, the seeds take 5-7 days, the flowering of one single flower takes 5-10 days, the formation of pods takes 15-25 days, ripening takes 10-12 days, and the yellowing of the leaves at the beginning of ripening lasts 8-12 days.

Therefore, one of the main economically valuable characteristics of soybean plant is the formation of pods and the height of their location on the stem, which depends on many factors, including the biological characteristics of the varieties, natural conditions, the fertility of the growing soil, the quality of the agro-measures used, the quality and rate of the macro and micro mineral fertilizers used in feeding, and the periods of feeding. as long as it happens.

The main part The object of the study: the formation of soybean pods, which are considered one of the morphological characteristics of economic importance, and the location along the layers of Nafis st andoz, Selekt-201 Selekt-302, Arletta and Dostlik, which are relatively new for the region, were studied in the unique soil and climate conditions of Khorezm region.

In 2019, the experiments were carried out in the fields of the limited liability company "Khonka elite seed farm" of Khorezm region, Khanka district.

Experimental method: Experiments: first treated with Nitrofix P preparation, second untreated, in 3 options for planting seeds; On April I-08, II-18, III-28, 4 of each variety were planted in 5 rows with the template variety Nafis, and the varieties were placed in the order given in the following system (scheme) by randomization method in four repetitions.

	Option I on April 8 planted					Option II on April 18 Planted						Option III was planted on April 28		
	Treated with Nitrofix P													
I Repet ition	Frien dship	Arlet a	C- 201	C- 302		Frien dship	Arlet a	C- 201	C- 302		Frien dship	Arl eta	C- 201	C- 302
	IIII I	IIII I	IIII I	IIII I		IIII I	IIII I	IIII I	IIII I		IIII I	IIII II	IIII I	IIII I
II Repet ition	Arlet a	Frien dship	C- 302	C- 201		Arlet a	Frien dship	C- 302	C- 201		Arleta	Frie nds hip	C- 302	C- 201
	IIII I	IIII I	IIII I	IIII I		IIII I	IIII I	IIII I	IIII I		IIII I	IIII II	IIII I	IIII I

III Repet ition	C- 201	C- 302	Frien dship	Arlet a		C- 201	C- 302	Frien dship	Arlet a		C-201	C- 302	Frien dship	Arlet a
	II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I
IV Repet ition	C- 302	C- 201	Arlet a	Frien dship		C- 302	C- 201	Arlet a	Frien dship		C-302	C- 201	Arlet a	Frien dship
	II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I
Nitrofix P is not processed														
I Repet ition	Arlet a	C- 302	Frien dship	C- 201		Arlet a	C- 302	Frien dship	C- 201		Friendsh ip	Arl eta	C- 201	C- 302
	II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I
II Repet ition	Frien dship	Arlet a	C- 201	C- 302		Frien dship	Arlet a	C- 201	C- 302		Arleta	Frie nds hip	C- 302	C- 201
	II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I
III Repet ition	C- 302	C- 201	Arlet a	Frien dship		C- 302	C- 201	Arlet a	Frien dship		C-201	C- 302	Frien dship	Arlet a
	II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I
IV Repet ition	C- 201	Frien dship	C- 302	Arlet a		C- 201	Frien dship	C- 302	Arlet a		C-302	C- 201	Arlet a	Frien dship
	II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I		II III I	II III I	II III I	II III I

Note: dark I pattern, simple I I I I main cultivar under study.

In the options, the row spacing of the varieties is 60 cm, one variety is placed in 5 rows with a template, and the width is 3 m. 5 m long. surface 15 m². One option is 12 m wide because it consists of 4 varieties. and the length is 5 m. and the area of one option was 60 m². In total, 3 options occupied 180 m², 4 iterations occupied 720 m². The total experimental area (with Nitrofix P and without Nitrofix P) was equal to 1440 m². For protection zones, 8 rows of 4.8 m wide template (st) varieties were planted around the experimental area. 15 cm between nests in a row, 4 plants were left in each nest, 27 bushes at 1 p.m., 450,000 bushes per hectare. Based on the growth characteristics of the stem of the variety, the height of the stem was divided into three equal proportions (Fig. 1).

Phenological observations; number of pods and biometric measurements, in one of 5 plants from the area occupied by the variety in the envelope method, a total of 96 plants and one plant of the st variety in a total of 182 plants, every seven days to determine the rate of pod formation along the tiers: I-30.06.2019, II It was conducted on 07.07.2019, III-14.07.2019.

Data were statistically processed in Microsoft Excel.

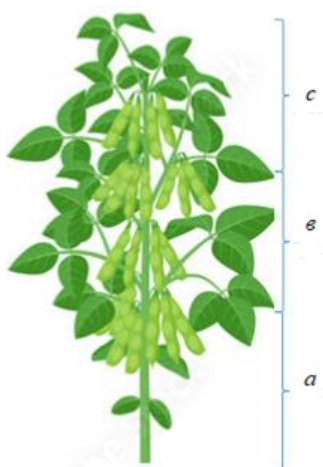


Figure 1. Shadow layers.

Tables in the text show statistical averages of data obtained from phenological observations.

Natural and soil-climate conditions of the study: Due to the uniqueness of the soil-climate conditions of Khorezm region, which is rarely found on earth, it is appropriate to briefly provide information about the hydrogeological history of its formation.

Khorezm is located in the Turan low plain, which is considered geographically without mountains, forests and currently without sea in Central Asia, in the north-west of Uzbekistan, in the lower part of Amudarya. To the west and south, the region is bordered by the Unguz Karakum sand dunes of Turkmenistan, to the north - to the west, to the north and north - to the east by the Kyzyl sand dunes of the Republic of Karakalpakstan and Bukhara region.

The total land area of Khorezm region is 605.2 thousand hectares, of which 206 thousand hectares are irrigated land.

"Khorazm oasis occupying the ancient delta of Amudarya was formed on a huge depression between the Sultan Uwais range in the north, Ustyurt in the west, Sultan Sanjar range in the east and the Karakum desert in the south. The initial delta (spread) of the Amudarya, the ancient Daryalik and Daudan rivers, as well as the deposits of many small tributaries. This sediment was formed by the direct participation of many tectonic and erosional processes. As a result, the bottom of the sediment has a very complex structure. At the bottom of the original Khorezm basin, lake-alluvial suite deposits were laid. This suite is composed of river sediments, and it may be the deposits of ancient rivers flowing from the north-east (Chu, Sarisu, Syrdarya, possibly Siberian rivers). Since the Amudarya itself began to fill this depression with alluvium from earlier times.

The thickness of general lake-alluvial deposits exceeds 140 m. At the same time, the thickness of the layer formed from the alluvial deposits of the Amudarya itself, Daryoliq and the old Daudan rivers is 30-35 m.

The underground water level is 1.0 — 2.5 (3) m in the bed and river bed of Daudan and Daryoliq, 1.0 — 2.0 m in interbed (lake) beds, and 0.5 — 1.0 m in closed sediments. rises to Currently, the underground water level in the Amudarya valley is about 0.5-2.0 m below the surface. The main source of groundwater is surface irrigation networks and water absorbed from irrigated fields. The period of their highest rise corresponds to the periods of salt washing and irrigation of the soil. At this time, the mineralization of underground water is low" [29].

The soil is marshy meadow, with varying degrees of salinity, the level of underground water is 0.3 m in some years, depending on the leaching of salt from the land and other factors. rises to Due to very low rainfall, it does not have a noticeable effect on the level of underground water. The water of the Amudarya is very little affected because it is under modern management.

A very small amount of natural underground water flows towards the Arol and Sarikamish sediments, the lack of water transport capacity of artificial drains has caused such a process of water exchange on the upper side, which leads to salinization of underground water and soil soil layers.

Because of this, all soils, both irrigated and non-irrigated, are exposed to some degree of salinity.

"On irrigated lands, the concentration of dissolved mineral salts in underground water ranges from 0.5 to 0.9 to 15.0 to 17.0 g.l. However, underground waters with mineralization of 5.0 g.l are more common. In protected areas, this indicator reaches 20.0 g.l or more.

The climate changes rapidly, i.e. cold nights in winter months, warm days, strong winds blowing from all directions in spring and summer, and very little precipitation. The average annual temperature of Khorezm region is around +12.3 - -12.4°C. The highest temperature is in May-August, it reaches +42-+44°C, and the coldest days are -29--32°C in December-January. Such a sharp drop in temperature is due to the influx of cold air from the north. In winter, sometimes cold temperatures cause the soil to freeze to a depth of 28-70 cm.

The period of hot and warm weather lasts 205-240 days. The total useful temperature is 2000-2300°C. The first frost falls on September 23 (1973), and the last spring frost falls on May 9 (1993).

Average annual precipitation is very small, ie 94-100 mm. The main part of precipitation falls on winter and spring periods.

Khorezm region is located in the zone of moderate wind activity. According to the directions of the annual wind, winds in the north-east direction are observed more often. On average, there are 6 night-day (day) dust storms in a year (in 10 days). The average wind speed is 3.5 m.sec. reaches [29].

High summer temperature, low atmospheric precipitation, low air relative humidity (37-41%) and frequent winds evaporate a lot of soil moisture (300-320 days per year), according to I.N.Flatsient (1964). according to "the annual evaporation of water from the soil surface is 1584-1651 mm, which is 18 times more than the amount of annual precipitation... Such a large amount of evaporation is the main cause of soil salinization in this hydrogeological condition" [30. -B.5.]. This further increases the need for irrigation of agricultural crops.

Soybean cultivation in such complex conditions requires scientific research to be carried out in order to develop and implement agrotechnics suitable for these conditions and to adapt new varieties of soybeans to the conditions.

In order to obtain a high and high-quality soybean crop, it is necessary to adapt its new promising varieties to our conditions, and to obtain a high and high-quality harvest from them, the development and implementation of agro-care measures taking into account the specific characteristics of the new varieties, as well as the perfect study of the morphobiological and physiological characteristics of the new varieties.

Morphological changes in the ontogenesis of soybean varieties are different depending on the characteristics of natural conditions, including weather, soil, water supply, mineral and organic fertilizers, feeding with other macro- and micronutrients, soil salinity levels, and other applied agro-measures.

Ontogenesis of soybean plant in the conditions of Khorezm region, the vegetation period is one year, depending on the biological characteristics of soybean species and varieties, the ripening of their crop varies depending on the planting period.

It is also not desirable for the planted varieties to be too tall or too short. Because being too tall prevents them from lying down or being worked between the rows, being short naturally causes a reduction in yield and a number of difficulties in harvesting, including the need for manual labor.

In addition, the placement of soybean pods on the stem also depends on the growth height of the main stem. In some varieties, pods are more densely placed in the first layer, in other varieties in the second layer, and in others more densely in the third layer.

The height of the first pods on the main stem is also in the range of 9-25 cm, depending on the natural conditions of the area where soybeans are planted and the agro-measures carried out, as well as the characteristics of soybean varieties [1].

Therefore, it is important to study the location of pods along the layers in new varieties of soybean in the Khorezm region of the Republic of Uzbekistan.

Before planting new types of agricultural crops or new varieties of one plant as a crop, planting them experimentally in new conditions and forming information on the growth and development of this crop or variety in new conditions, both practically and theoretically, on a scientific basis is also of great importance. The main task of our research is to study the adaptation of agricultural crops to the conditions of the Khorezm region, the changes in their morphology, physiology, modification and biochemical composition in new conditions, as well as to develop and implement agrotechnical measures used to obtain high and quality crops in the conditions.

The results obtained

In tables:

- planting dates; 08.04.2019 term I, 04.18.2019 term II and 04.28.2019 term III Roman numerals;
- tracking dates; Number 1 on June 30, number 2 on July 7 and number 3 on July 14;
- 1- the first lower layer presented in the picture is presented in the form of letters a, the second middle layer v and the third upper layer s.

Nafis variety of soybean is considered a local variety, and its morphobiological, physiological, as well as the formation and productivity characteristics of the pods have been studied, so the following results were obtained when planting this variety as a model variety and studying the features of the formation of pods on the main stem in order to compare this variety with relatively new varieties.

Table 1 The rate of formation of pods and their location along the layers of the stem on the stem of St.

Planting period	Follow up date	Beans in layers (pieces)		
		a	b	c
I	1	12,1±0,29	9,2±0,04	6,9±0,23
II		14,9±0,34	10,8±0,15	9,1±0,25
III		16,3±0,07	14,5±0,06	13,1±0,13
I	2	13,3±0,14	11,5±0,11	9,6±0,04
II		15,7±0,20	12,4±0,04	10,2±0,12
III		17,2±0,23	15,1±0,20	14,2±0,07
I	3	14,3±0,12	12,5±0,08	10,5±0,03
II		15,9±0,06	14,2±0,01	13,1±0,12
III		18,7±0,07	16,6±0,15	15,7±0,14

The formation of pods along the tiers on the main stem of the model Nafis variety is as follows:

- in the first term;
- In the a layer of stems grown from seeds sown treated with nitrofix drug; 12.1 units on the first day of observation, and 14.3 units on the third day;
- in the II and III periods;
- 14.9 in the first observation at the first stage; 9.1 in the upper c layer; in subsequent observations, it was found that there were 3.8 to 6.6 grains more in all layers compared to the first observation (Table 1);

1a-Table

When the seeds are sown without treatment with the drug Nitrofix P

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	9,8±0,04	8,9±0,03	8,6±0,03
II		14,7±0,46	11,5±0,24	9,8±0,08
III		16,3±0,28	15,8±0,52	10,1±0,29
I	2	15,1±0,33	12,2±0,30	11,6±0,46
II		16,3±0,27	12,3±0,13	11,8±0,24
III		17,8±0,11	15,5±0,33	14,5±0,30
I	3	16,4±0,55	13,8±0,14	12,2±0,24
II		17,1±0,36	13,9±0,16	12,1±0,24
III		18,1±0,08	17,4±0,34	15,2±0,27

- in stems formed from seeds sown without treatment with the drug; Planted in term I and in the first observation; 9.8 in tier *a*; 8.6 in *s* tier; in subsequent observations; from 15.1 to 16.4 units in the *a* tier, from 8.9 to 13.8 units in the *b* tier, and from 8.6 to 12.2 units in the *c* tier;

Planted in the II and III periods: in layer *a*, the second period from 14.7 in the first observation, the third period from 18.1 in the third observation, i.e. 3.4; 11.5 to 15.5 i.e. 4.0 respectively in tier *b*; It was observed that 9.8 to 15.2, i.e. 5.4 more pods were produced in the *c* layer (Table 1a);

The Selekt-201 variety belongs to the Krasnodar selection and was created by crossbreeding Manchurian varieties. Despite the fact that it is considered a relatively new variety for the soil and climate conditions of the Khorezm region, its growth and development characteristics have not been observed. The results of observing the formation of pods and the formation of pods along the tiers on the main stem were as follows:

Table 2 The seeds are treated with Nitrofix P preparation, the formation of pods in the layers of the main stem of the main Selekt-201 variety

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	9,9±0,21	8,1±0,29	7,1±0,19
II		10,9±0,55	8,9±0,57	8,7±0,34
III		12,9±0,83	10,8±0,76	9,9±0,59
I	2	12,1±0,13	10,6±0,09	8,5±0,20
II		13,3±0,34	10,3±0,51	9,9±0,18
		14,8±0,54	12,7±0,73	10,3±0,80
I	3	13,0±0,17	11,1±0,23	9,2±0,26
II		14,1±0,35	12,0±0,50	10,4±0,48
III		15,9±0,76	13,8±0,77	11,6±0,78

When the seeds are planted with Nitrofix P preparation:

- planted in the first term; 9.9 units on the first observation date, 13.0 units on the third observation date; 12.1 in the second observation at level -a; 8.5 in the upper *c* layer; planted in the next II and III periods, and in observations 2, 3, 8.1 to 15.9 pods were formed in all tiers (Table 2).

2_a-Table

When the seeds are sown without treatment with the drug Nitrofix P

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	7,1±0,64	6,9±0,47	6,2±0,51
II		9,1±0,79	7,2±0,72	6,9±0,56
III		11,9±0,71	10,8±0,60	9,6±0,40
I	2	12,1±0,34	7,1±0,84	6,5±0,68
II		12,9±0,71	9,8±0,64	7,1±0,66
III		13,9±0,76	11,8±0,72	10,7±0,55
I	3	12,6±0,30	8,7±0,55	7,1±0,49
II		13,4±0,47	10,1±0,55	8,3±0,61
III		15,6±0,64	12,9±0,66	11,2±0,62

-planted in the first period, and in the first observation, 7.1 pods were formed in layer *a*, and in the third observation, 12.6 pods were formed. In comparison to the one in the lower *a* tier, the sprouted stems from seeds sown without treatment with Nitrofix preparation are less from 0.2 to 0.9 units in the middle *b* and upper *c* tiers;

- in stems formed from seeds sown without treatment with Nitrofix drug in the II and III periods;
- in the first observation; 9.1 in the lower *a* layer; 6.2 in the upper *c* tier; in subsequent observations; from 12.1 to 12.6 units in tier *a*, from 7.1 to 8.7 units in tier *b*, and from 6.5 to 7.1 units in tier *c*;
- 12.9 to 15.6 in layer *a* in observations 2 and 3; It was determined that 7.1 to 11.2 pods were formed in the *c* layer (2_a-table).

The Selekt-302 variety also belongs to the group of European varieties. However, due to the fact that the morphobiology of this variety, which is located in the Central Asian region of Asia, has not been thoroughly studied in the Khorezm region, where the weather is dry and the annual rainfall does not exceed 90-100 mm, the following results were obtained when planting and observing the process of formation of pods on the main stem.

Table 3 Selekt-302, treated with the drug Nitrofix P characteristics of the formation of pods in the stem layers of the variety

Planting period	Follow up date	Beans in layers (pieces)		
		<i>A</i>	<i>a</i>	<i>c</i>
I	1	12,7±0,42	11,8±0,54	10,9±0,66
II		15,6±0,50	13,7±0,50	11,9±0,38
III		21,2±1,03	17,5±0,73	15,9±0,75
I	2	15,3±0,59	13,2±0,49	11,3±0,42
II		16,8±0,44	14,8±0,50	12,1±0,31
III		22,8±1,02	20,9±1,10	19,6±1,27
I	3	15,9±0,48	14,6±0,55	13,1±0,61
II		18,7±0,67	16,9±0,59	14,6±0,46
III		22,9±0,87	21,8±1,01	20,8±1,12

Due to the effect of the Nitrofix P drug on the formation of pods in the stem layers of the Selekt-302 variety;

- In the stems grown from soybean seeds sown in the first planting period, it was observed that 12.7 pods were formed in the *a* layer, in the first observation, 10.9 pods were formed in the *c* layer, and in the second and third observations, 15.3 to 15.9 pods were formed in the *a* layer, and 11.3 in the *c* layer. 13.1 pods;
- in the next II and III periods, in all observations, it was found that 15.6 to 22.9 pods were formed in the *a* layer, 11.9 to 20.8 pods in the *c* layer () (Table 3).

3_a-Table

When the seeds are sown without treatment with the drug Nitrofix P

Planting period	Tracking the date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	12,3±0,52	11,6±0,58	10,8±0,52
II		15,9±0,73	13,8±0,75	12,1±0,60
III		17,9±0,63	16,7±0,72	14,5±0,70
I	2	14,9±0,28	13,6±0,61	11,8±0,50
II		17,5±0,54	15,9±0,72	13,3±0,72
III		21,7±0,98	19,2±0,71	15,6±0,55
I	3	16,7±0,61	14,5±0,74	12,1±0,63
II		19,1±0,81	16,8±0,94	14,8±0,84
III		22,5±0,09	19,8±0,59	16,3±0,52

When seeds are sown without preparation:

- between 12.3 and 16.7 units in all observations and all levels in stems grown from seeds sown in the first periods;
- it was found that between 15.9 and 22.5 pods appeared in the bushes grown from the seeds planted in the second and third periods in all observations, at all levels (3_a-table).

The Arletta variety is adapted for planting in the Krasnodar region of Russia, and it is a Manchurian variety of origin. The climate of the homeland of this variety is temperate, famously eastern is asian For this reason, we obtained the following data when we planted this variety in order to study its morphobiology in Khorezm region, where the air is dry and the soil is salty.

Table 4 Characteristics of pod formation in the stem layers of the Arletta variety treated with Nitrofix P preparation

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	7,3±0,79	6,5±0,64	5,1±0,64
II		9,6±0,85	9,1±0,53	8,2±0,45
III		13,3±0,74	10,1±0,92	8,9±0,81
I	2	8,4±0,95	7,7±0,74	6,8±0,58
II		11,8±0,68	10,1±0,55	9,1±0,81
III		15,1±0,70	13,1±0,64	10,2±0,83
I	3	9,8±0,89	8,9±0,72	7,5±0,64
II		12,7±0,67	11,3±0,66	9,3±0,73
III		16,5±0,56	14,4±0,64	11,5±0,80

of the stems grown under the influence of the drug planted in period I:

- 7.3 at the first observation at level *a*; 8.4 in the second follow-up; 9.8 at the third follow-up; 5.1 respectively in tier *c*; 6.8; 7.5; between these indicators in the middle tier; In the second period, the sprouted stems from the seeds planted in the suitable raish; 9.6 at level *a*; 11.8; 12.7; 8.2 in tier *c*; 9.1; 9.3; 13.3, respectively, in the bushes grown from the seeds sown in the III period; 15.1; 16.5; 8.9 in tier *c*; 10.2; 11.5 pods were formed (Table 4).

4_a-table

The seeds were not treated with Nitrofix P

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	7,5±0,55	6,9±0,47	6,1±0,30
II		8,2±0,99	7,3±0,76	7,1±0,59
III		10,3±1,06	9,3±0,93	8,8±0,58
I	2	9,9±0,84	7,5±0,75	6,9±0,59
II		11,6±0,78	10,9±0,39	7,6±0,55

III	3	13,1±0,94	12,5±0,56	10,7±0,55
I		10,5±0,77	8,6±0,58	8,2±0,24
II		11,9±0,80	8,8±0,85	7,9±0,70
III		14,4±0,91	12,8±0,68	11,9±0,47

On the main stems in this background: pods at the first observation in those planted in the first term; 7.5 in tier *a*; 6.1 units in layer *c*, in those planted in the second term; 8.2 in tier *a*; 7.1 units in layer *c*, in those planted in the third term; 10.3 in tier *a*; 8.8 units in tier *c*; in the second and third observation, it was found that the pods were harvested from 9.9 to 14.4 units at all levels when planted in all periods. (4_a-Table).

The friendship variety is among the local varieties created by the scientists of the Rice Research Institute of Uzbekistan. The morphobiological characteristics of the variety have hardly been studied in the conditions of the Khorezm region, which is considered to be the northern region of Uzbekistan, with unique soil and climate conditions. Taking this into account, the following results were obtained when this variety was planted on its main stem, and the characteristics of the formation of pods, which are considered one of the most important indicators of the harvest, were studied.

Table 5 The characteristics of the formation of pods in the stem layers of the Dostlyk variety treated with the drug Nitrofix P

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	12,1±0,29	11,3±0,43	9,7±0,39
II		15,9±0,56	14,8±0,75	13,2±0,67
III		19,3±0,60	18,2±0,89	14,9±0,53
I	2	14,2±0,34	12,1±0,24	10,8±0,31
II		16,5±0,38	15,3±0,51	14,3±0,61
III		20,2±0,44	18,1±0,47	15,2±0,29
I	3	15,8±0,46	13,6±0,33	11,6±0,27
II		17,5±0,41	16,8±0,57	15,4±0,64
III		21,4±0,53	19,7±0,55	16,5±0,32

In the bushes formed from the seeds sown in the first term, in the first observation, there are 12.1-9.7 units in the levels *a*, *b*, *c*, in the second observation, 14.2-10.8 units, and in the third observation, 15.8-11.6 units; in the second and third planting periods, it was observed that pods were formed in the range of 15.9-21.4 units in all observations and layers (Table 5).

5_a-Table

The seeds were not treated with Nitrofix P

Planting period	Follow up date	Beans in layers (pieces)		
		<i>a</i>	<i>b</i>	<i>c</i>
I	1	13,1±0,70	10,8±0,40	9,6±0,25
II		15,3±0,59	12,4±0,44	11,5±0,47
III		18,9±0,86	14,8±0,30	13,9±0,56
I	2	16,2±0,57	13,9±0,68	10,9±0,30
II		18,1±0,68	14,6±0,43	11,1±0,24
III		20,1±0,62	16,1±0,24	14,2±0,24
I	3	13,6±0,08	12,3±0,25	10,8±0,34
II		15,9±0,09	13,9±0,30	12,1±0,24
III		21,8±0,74	17,7±0,41	15,3±0,30

The pod formation characteristics of the bushes grown from the seeds sown without treatment with the drug were as follows: 13.1 in *a* layer in those planted in the first planting period; 10.8 pods in layer *b* and 9.6 pods in layer *c* in the first observation, and 15.3 to 21.8 pods were formed in all observations and all layers in the second and third planting periods. (5_a-Table).

Discussion:

The formation of pods on the main stalks formed from the sprouted bushes from the seeds planted with Nitrofix P preparation of the Nafis variety, the maximum number of pods was 18.7 pieces in the lower layer of the stem in the late, third planting periods of soybeans and in the third observation, in the upper layers and when the seeds were planted without treatment with Nitrofix P preparation. formation decreased by 0.6 units and amounted to 18.1 units. So, planting seeds of this variety in the third ten days of April with the drug Nitrofix P significantly increases the number of pods compared to those planted earlier.

The formation of pods of the Selekt-201 variety compared to the model variety in all planting periods and observations, the seeds of which were planted with Nitrofix P drug were 2.1 to 2.8 pieces, and the seeds were sown without treatment -2.7 to -2.6 pieces, the variety is effective (vegetation) indicates that the period is long compared to the model.

When the seeds of the Selekt-302 variety are cultivated with the drug, the total number of pods in all three layers is 65.5; 58.6 units were planted without the drug, 14.5 compared to standard variety (51; 50.7); 7.9 units produced a lot of pods, making it a suitable variety for the conditions.

When the seeds of the Arletta variety are planted with the drug, the total number of pods is 42.4; 39.1 pieces when planted without treatment, compared to the control (51; 50.7), -8.6; - It was found that the conditions are unfavorable for it, producing 11.6 less pods.

Despite the fact that the friendship variety is a local variety, the total number of pods in those whose seeds are treated with the drug is 57.6; those planted without processing produced 54.8 pods, compared to the standard 5.6; It was 3.9 pieces more, and it proved to be a good variety for the conditions.

So, in the conditions of Khorezm region, there is a possibility of getting a high quality harvest if the seeds of Nafis, Selekt-302 and Dostlik varieties are treated with Nitrofix P and planted between April 15-25.

REFERENCES

1. Abaev A.A. Technology vozdeleyvaniya soi v usloviyakh Severo-Kavkazskogo regiona Vladikavkaz, 2016. – 129 p.
2. <https://kzref.org.tarakkietiga-boglik-bulib-fannnng-rivojlanichpp-a-kup-o.html?page=12>
<https://goo.su/m98P6j> (2022.09.21)
3. Ataboeva Kh. Plant science, Tashkent, 2004.–B.1-8,
4. Soy, kak zalog zdorovya natsii i prodovolstvennoy bezopasnosti Rossiyskoy Federatsii (infotechno.ru)
<https://goo.su/zoX01Tw> 2022.09.23
5. https://www.saatbau.com/uploads/magazine/soy_2016.pdf <https://goo.su/EF5J9Xv> 2022.09.23
6. Osobennosti formirovaniya semyan soi - AgroPerspektiva (agroperspektiva.com.ua) <https://goo.su/Ht7l> 2022.09.23
7. <https://www.agrodialog.com.ua.rost-i-razvitie-soi.html> <https://goo.su/wnU2LCp> 2022.09.23
8. <https://agro/uz/uz/services/recommendations/8285/>
9. Khalilov N., Artikov Z. Recommendations for the care of new varieties of soybeans. 2017
10. soy_2016.pdf (saatbau.com), <https://goo.su/Xy3xeOh> 2022.09.23
11. SOTTOROV O., Number and norms of irrigation of soybean varieties Tashkent, AGRO ILM -2019 #4.-B. 38.
12. Zelentsov S.V., Ahmadi M.R. Issledovanie prichin obrazovaniya anomalno razvityx grandfather soi na severe Irana. Krasnodar, Elektronny zurnal «ISSEDOVANO V ROSSII» 602
13. <http://res.guldu.uz.guldu/uploads/audio.akhborotnoma.guldu-axb-2019-3-1-converted.pdf>.
<https://goo.su/WbKpLO> 2022.09.23
14. Karshibaev Kh. K. Cultivation of the "favorite" soybean variety in Mirzachol. Gulistan, BULLETIN OF GULISTON STATE UNIVERSITY, 2019. No. 3 -B. 41-46.
15. Kirillov A., Kharchuk O., Kozmik R., Kirillova E., Bashtovaya S., Kistol M. Gradiyenty vodnogo potentsiala, transpiration i effektivnoe spolzovanie vody rasteniyami soi. glycine max l. Moldovy Buletinul ACM. Science of life. 2015. No. 1(32)
16. Abduazimov A. M., Mirzaev N. F. The effect of mineral fertilizers on the productivity of soybean varieties. (12.06.2022)
17. Siddikov R., Mominov A., Ergashev U. Effect of application of mineral fertilizers on biometric indicators of soybean varieties and grain yield. Tashkent, 2019, AGRO ILM #4.-B.39

18. Mengel D, Ruiz-Dias D., R. Acebedo i MaxwellT. Podkormka soi azotnymi udobreniyami pri azotnom holodanii rasteniy 06 May 2013 <http://eeca-ru.ipni.net/article.EECARU-2178> <https://goo.su/SyCt91P> (12.05.2022)
19. Umarova N., Saitkanova R., Idrisov Kh. Effects of micronutrients on soybean photosynthetic activity and yield. Tashkent, 2019. AGRO SCIENCE, #4. -B.40.
20. Atabaeva H., Sattarov M.. Effect of mineral fertilizers and sulfur on growth and development of soybean plant. Tashkent, 2019. AGRO ILM, #4. -B.37.
21. Abdurakhimov N.N., Shaymanov Sh.Q. Prospects of soybean cultivation in the south of Uzbekistan, a collection of scientific-practical conference materials on the topic "Actual issues of increasing the role of scientific research institutes and higher education institutions in increasing the efficiency of the agricultural sector of the Republic of Uzbekistan". -Tashkent, 2018, 1-T. -B. 25-26
22. Mavlyanova R.F., Zuev V.I., Kim V.V., Pirnazarov D.R. Technology vozdeystviya ovoshchnoy soi v uzbekistan Tashkent-2013. 10. p.
23. Abdukarimov D., Khalilov N., Kuldashov B. Cultivation of new soybean varieties in irrigated lands. Tashkent, 2019. AGRO SCIENCE, #4. - B. 35-36.
24. Oserbaeva T., Jumanova G. Formirovanie ploshchadi listev soi v zavisimosti ot srokov poseva. Achievements and prospects of agricultural science in the implementation of the food program in Uzbekistan. Samarkand, 2015. I Q. - B. 137-142
25. Dojmukhambetova M.M. Vliyanie norm vyseva na urozaynost i kachestvo soi v usloviyakh orosheniya. ABSTRACT dissertatsii na soiskanie uchenoy stepi kandida selskohozyaystvennyx nauk Astrakhan - 2009.-S.11.
26. Mavlyanova R., Abdullaev F. K. Ovoshchnaya soya [Vegetable soybean] June 2009 DOI: 10.13140.RG.2.2.13891.91680<https://www.researchgate.net>. publication. 325857772_Ovosnaa_soa_Vegetable_soybean <https://goo.su/ct8soJ> (16.05.2022)
27. https://studref.com.407403.agropromyshlennost.zernovye_bobovye_kultury <https://goo.su/N46Bvm> (16.05.2022)
28. <https://agroprognoz.ru.biologicheskie-osobennosti-soi..> <https://goo.su/nwtU> (16.05.2022)
29. Soils of Khorezm region. -T: UzR FA "FAN", 2002.
30. Kruglova E.K., Dehkankhodzhaeva S.Kh., Mukhammedjanova A., Turaev T. Microelementy and oroshaemyx pochvax of Khorezm region. Tashkent, FAN. 1980. -S. 5.