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Analysis of Morphological Characteristics of Soybean Varieties

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Abstract. Nowadays, the demand for soybeans has been increasing in many countries around the world. Soybean plant is considered to have many beneficial properties for humans and food. Its grain is one of the most valuable crops and is more expensive than other crops because it contains 50% protein and up to 28% oil. Today, more than 400 different products necessary for the national economy are made from soybeans. The article analyzes the morphological characteristics of "Akcent" and "Uzbek-6" soybean varieties without mineral fertilizers. In the results of the analysis, it was noted that the disparity between the characters mainly depends on the genotype.
Key words: soybean, morphological, stem, root, leaf, chlorophyll.

Inroduction: The fact that food products consumed by the world's population are rich in protein, carbohydrates, vitamins and minerals are very important factors. Most of the scientific studies that have been conducted indicate that 12% or 90-100 grams of protein should be in the food consumed by humans. Currently, with the increase in the population, the demand for protein-rich food products is increasing. We can mention soybean (Glycine max (L.) Merr.) as one of these crops.

Literature review: Soybean (Glycina hispida L.) belongs to the family of legumes (Fabaceae L.) and is a group of annual herbaceous plants, a leguminous grain and an oilseed. The homeland of the soybean plant is South-East Asia [1], it was cultivated in central China in 7000 BC. Soybean is considered an ancient crop and has been used for food and medicine in China, Japan and Korea for thousands of years. Soybeans were introduced to the United States in 1804 and became an important crop in the South and Midwest by the mid-20th century. The leading countries in soybean cultivation are USA, Brazil, Argentina, India and China. The main reason for the cultivation of soybean on large areas in different countries is that its grain and green mass are nutritious and can be used in food, fodder, technical and medical fields. Depending on the type of soybean and growing conditions, its grain contains 30-55% protein and 17-26% fat. 20-25% of carbohydrates, 4-5% of many elements (including Sa, R, K, Na, I, Mo, etc.) and vitamins (E, B_1, B_2, B_6) are found in soybean grain [2]. More than a thousand products are obtained from soy. Soybean is considered one of the main crops in the production of food protein, oil, kunjara, and umkhta fodder [3].

As a result of breeding efforts aimed at adapting to soil climatic conditions (high temperature, water shortage) through the use of modern technologies for soybean cultivation, the area and yield of this crop is expanding

year by year. Coya accounts for more than 60% of global vegetable oil and protein consumption and is the fourth largest agricultural crop by volume [4 , 5 , 6].

Research materials and methods. The research was conducted in the experimental field of the Rice Research Institute without the use of mineral fertilizers. "Accent" and "Uzbek-6" soybean varieties were used as research material.

Analysis of results. In studies conducted without using mineral fertilizers, the total average indicator of stem length of the new "Akcent" soybean variety brought from Russia was 47.1±2.32 cm. and it was noted that among the options there are also plants with a stem height of 60 cm. Among the options, the lowest result is 34 cm. formed It can be concluded that the new "Accent" variety has not become homozygous for this morphological character based on the plant height. Plant height varies depending on agrotechnical measures and environmental conditions of the variety. In 10 selected plants, it was noted that the index of root length was in the range of 16-27 cm.

The overall average was 20.6±1.07 cm. The root of a plant is considered an important tissue, and it is an important organ that supplies dissolved mineral substances in the soil along the plant stem. Therefore, the long and abundant root ensures optimal development of the plant.

The creation of high-yielding varieties is a difficult task, the necessary characters in many cases have a negative correlation, and the collection of such characters in one genotype requires solving several fundamental and practical problems. One of these traits is the leaf organ, which has a negative correlation with some traits.

Table 1

Morphological signs of " Accent " variety

The name of the variety	Number of plants	Plant height (cm)	Root length (cm)	Number of leaves (piece)	Chlorophyll content, (mg)	The dry mass of the plant, (g)
Accent (Russia) is a new variety for the first time	1	46	16	19	42,7	48,45
	2	52	21	24	44,6	55,37
	3	50	19	19	43,9	52,88
	4	34	17	18	51,2	36,77
	5	45	19	17	36,2	46,33
	6	50	21	25	49,2	53,22
	7	38	19	20	51,8	40,99
	8	45	22	26	42,8	42,87
	9	51	25	27	49,7	58,56
	10	60	27	32	44,1	62,22
General indicator		**47,1±2,32**	**20,6±1,07**	**22,7±1,52**	**45,6±1,52**	**49,7±2,56**

In our studies, it was noted that the number of leaves was in the range of 17-32 pieces when analyzed. It was found that the average number of leaves was 22.7±1.52 pieces. Being the main component of the leaf, chlorophyll pigments play an important role. Because the organic matter in plant grain is mainly formed in the process of photosynthesis. If the amount of chlorophyll in a plant decreases, the growth of leaves slows down, yellowing occurs, and chlorosis occurs. In our research, the amount of chlorophyll was observed in the range of 36.2-62.2 mg/g without the use of mineral fertilizers.

The overall mean was 45.6±1.52 mg/g. It was noted that the average value of the total plant biomass was 49.7±2.56 g. It was noted that the height of the stem varies in the range of 12-25 cm in the second Uzbek - 6 local variety of

our research. It was observed that such a change in stem height depends on external environmental conditions. Because all traits of the plant, including stem height, are genetically homozygous when it comes to the variety. That is, the height of the stem will be the same. In some cases, it can change with a small difference due to the influence of genotype and environment.

Table 2

Morphological signs of Uzbek - 6 varieties

The name of the variety	Number of plants	Plant height (cm)	Root length (cm)	Number of leaves (piece)	Chlorophyll content, (mg)	The dry mass of the plant, (g)
Uzbek – 6	1	80	12	42	36,4	41,74
	2	78	13	38	46,6	58,13
	3	90	24	47	38,6	86,18
	4	92	18	51	32,2	89,17
	5	48	15	24	34,3	38,09
	6	60	13	29	40,8	48,11
	7	58	18	31	40,7	59,08
	8	51	20	29	34,2	60,09
	9	63	24	28	36,2	45,33
	10	70	25	35	35,1	52,52
General indicator		**69,0±4,9**	**18,2±1,56**	**35,4±2,81**	**37,5±1,34**	**69,0±4,9**

In our research, it was noted that the overall average indicator of stem height is 69.0±4.9 cm. It was found that the total average values of root length and number of leaves were 18.2±1.56 and 35.4±2.81 cm. The average values of chlorophyll and total biomass were 37.5±1.34 mg/g and 69.0±4.9 g, respectively. In our studies, when we compared the varieties "Accent" and "Uzbek-6" in terms of root length and chlorophyll content, the root length of the "Accent" variety was 20.6 cm, the amount of chlorophyll was 45.62 mg/g, and the root length of the "Uzbek-6" variety was 18.2 It was observed that the amount of chlorophyll in cm showed a result of 37.51 mg/g. A higher result was observed for the Aksent variety compared to the Uzbek-6 variety. The opposite result was observed for leaf number and total biomass. That is, the "Uzbek - 6" variety had a total biomass of 35.4 pieces, 57.84 g, and the "Accent" variety had 22.7 leaves, and the total biomass was 49.76 g.

Conclusion.

According to the morphological characteristics of the investigated soybean varieties "Accent" and "Uzbek-6" in terms of total biomass and number of leaves, the "Uzbek-6" variety had a high result, while the "Accent" variety had a high root length and chlorophyll content. It can be concluded that the disproportion of the characters can change depending on the genotype.

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