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ANALYSIS OF PROTEIN AND OIL CONTENT IN SEEDS OF INTRODUCED SOYBEAN VARIETIES, LOCAL VARIETIES, AND THEIR FAMILIES

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Аннотация. Изменения биохимического состава и качества зерна сои зависят от её генетических и сортовых особенностей, а также почвенно-климатических условий. Изучение содержания белка и масла имеет важное значение при оценке семейств, линий и сортов сои. Исследования в Узбекистане, направленные на расширение площадей возделывания сои и повышение её продуктивности, в первую очередь направлены на селекцию сортов сои и получение высоких урожаев. В республике соя пока не получила полного распространения, однако в последние годы проведен ряд исследований, посвященных агрономическим и экономическим аспектам её использования. Большое значение имеют исследования по созданию сортов сои, адаптированных к климатическим условиям и агротехническим возможностям Узбекистана. В связи с этим одним из приоритетных направлений является создание устойчивых к болезням и высокоурожайных сортов сои.
В статье представлены данные по анализу содержания белка и масла в семенах интродуцированных, местных сортов и семей сои, созданных на их основе.

Abstrakt. Changes in the biochemical composition and quality of soybean grain depend on its genetic and variety characteristics, and soil-climatic conditions. The study of protein-oil content is important in the evaluation of soybean families and lines and varieties. Research in Uzbekistan to expand soybean cultivation areas and increase productivity is primarily focused on the selection of soybean varieties and obtaining high yields. Soybeans are not yet fully cultivated in the republic, but in recent years a number of studies have been conducted on the agronomic and economic aspects of soybean. Research on the creation of soybean varieties suitable for the climatic conditions and agronomic capabilities of Uzbekistan is of great importance. In this regard, one of the priorities is the creation of disease-resistant and high-yielding soybean varieties.
This article provides information on the analysis of protein and oil content in the seeds of introduced soybean varieties, local varieties and families based on them.

Ключевые слова. Сое, урожайность, ценные хозяйственные признаки, сорт, рисунок, размер, превосходство.

Keyword. Soybeans, yield, valuable economic traits, variety, pattern, size, superiority.

The biochemical composition (protein and oil content) of seeds of collection soybean varieties was analyzed using the Infrascan-3150 instrument.
The average protein content of the new soybean varieties ranged from 35.61±0.22% to 38.68±0.14%, while the average oil content was 17.79±0.25% to 19.78±0.19%.

According to the biochemical analysis results of the introduced Krasnodar and local varieties, the protein content varied from 39.00% (Arleta, Liniya) to 40.00% (Selecta 201, Selecta 302, Nafis, Baraka). For all varieties, this figure was 39.00–40.00%. The protein content of the model Orzu variety was 38.03%, and all Krasnodar and local varieties exceeded the model variety in a range of parameters. The Selekta 302 and Nafis varieties also demonstrated high protein and oil content: protein content was 40.00% and 40.00%, oil content – 20.00% and 20.00%, respectively (see Table 1).

Arleta – average protein content (39.00%) and average oil content (18.44%) in the Ertapişar variety samples; Avanta – average protein content (39.00%) and above-average oil content (20.0%); Selekta 201 – above-average protein level (40.00%) and average oil content (18.95%); mid-early Selekta 302 and mid-early Nafis – seed protein content of 40.00%, oil content of 20.00%. This was found to be above-average protein and fat levels.

The protein content of seeds from the collection variety Krasnodarskiy was higher than the average protein content of the early Arleta variety. The early Liniya and Selecta 201 varieties, as well as the mid-early Selecta 302 variety, had protein content 0.97-1.97% higher than that of the standard Orzu variety (38.03%). The oil content in the seeds of the collection variety was similar to that of the early Arleta and Selecta 201 varieties and close to that of the Uzbekskaya 2 variety (18.62%). The early Arleta and mid-early Selecta 302 varieties were found to have oil content higher than the average and 1.38% higher than that of the Orzu variety (18.62%).

The variability in protein content between samples of the Krasnodarskiy collection variety was 1.0%, and in oil content, 1.56%. The combined minimum protein and oil content of the collected soybean samples imported from Krasnodar was 57.44 ± 0.40 (Arleta variety); the maximum was 60.00 ± 32.0 (Selekta 302 variety). The minimum and maximum were 0.49% and 3.22%, respectively, respectively, which distinguishes it from the model variety Orzu (56.65 ± 0.35).

According to the analysis of protein and oil content in the studied samples of the Krasnodar variety, the Selecta 302 variety (40.0% and 20.0%, respectively) had higher protein and oil content than the other samples.

Soybean varieties with protein and oil content: Selecta 302 and Nafis (40.0% and 20.0%, respectively); those with increased protein content: Selecta-201 (40.0%); those with increased oil content: Liniya (20.0%), Nafisa (20.0%), and Selecta-302 (20.0%). These varieties can be used in genetic breeding research.

Table 1

Biochemical composition of soybean variety samples from the Krasnodar Krai collection and seeds of local varieties

№	Soybean Variety	Quantity (%)		
		Protein	Oil	Protein + Oil
1.	Арлета	39,50±0,25	18,20±0,25	57,70±0,50
2.	Селекта 201	40,30±0,30	19,50±0,17	59,80±0,47
3.	Селекта 302	40,50±0,36	21,00±0,19	61,00±0,42
4.	Линия	39,30±0,29	20,10±0,15	59,40±0,35
5.	Нафис	40,40±0,35	20,20±0,18	60,60±32,0

6.	Барака	40,10±0,29	19,30±0,19	59,40±0,56
7.	Мадина	39,90±0,27	20,14±0,21	60,04±0,54
8.	Орзу (ст)	39,20±0,15	19,60±0,25	56,65±0,35

In conclusion, it should be noted that the Selecta 302 and Nafis varieties are recommended for increasing protein and oil content in soybean seeds. Selecta-201, Selecta-302, Nafis, and Baraka varieties are recommended for increasing protein content. Genetic and breeding studies.

According to the study results, the biochemical composition of the grain of the isolated soybean families ranged from 40% (O-3/6, O-2/6) to 42% (O-5/6), while the reference variety had a biochemical composition of 38% (see Table 2).

Oil content ranged from 17% (O-5/6) to 20.76% (O-2/6), while the reference variety had a biochemical composition of 18.62%. In turn, an inverse correlation was observed here, and a slight decrease in the amount of oil was noted - 17.66% due to the high protein content in the O-5/6 variety (42%).

Table 2

Soybean seeds in isolated families biochemical composition

№	Soybean Variety	Quantity (%)		
		Protein	Масло	Protein
		M±м	M±м	
1.	O-17/20	40,00±0,29	19,05±0,19	59,05±0,56
2.	O-5/6	40,00±0,30	20,19±0,25	60,19±0,46
3.	O-11/6	40,00±0,42	19,69±0,35	59,69±0,68
4.	O-7/6	40,00±0,39	20,76±0,12	60,76±0,38
5.	O-3/6	42,00±0,39	17,66±0,22	59,66±0,58
6.	O-2/6	41,00±0,35	17,64±0,23	58,64±0,54
8.	Орзу (ст)	38,03±0,15	18,62±0,25	56,65±0,35

In conclusion, it should be noted that among the families, it is advisable to use the O-5/6 and O-11/6 families for increasing protein content in genetic selection studies, and the O-2/6 family for increasing oil content.

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