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JOURNAL	World Science
p-ISSN	2413-1032
e-ISSN	2414-6404
PUBLISHER	RS Global Sp. z O.O., Poland

ARTICLE TITLE	THE RESULTS OF COMPARING THE PARAMETERS OF BIOCHEMICAL COMPOSITION OF DIFFERENT SOYBEAN SPECIES SEEDS, GROWN IN THE CONDITIONS OF CHUI VALLEY
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ARTICLE INFO	Biimyrsaeva Aidana Kamchybekovna. (2022) The Results of Comparing the Parameters of Biochemical Composition of Different Soybean Species Seeds, Grown in the Conditions of Chui Valley. *World Science*. 6(78). doi: 10.31435/rsglobal_ws/30122022/7896
DOI	https://doi.org/10.31435/rsglobal_ws/30122022/7896
RECEIVED	10 December 2022
ACCEPTED	27 December 2022
PUBLISHED	30 December 2022

THE RESULTS OF COMPARING THE PARAMETERS OF BIOCHEMICAL COMPOSITION OF DIFFERENT SOYBEAN SPECIES SEEDS, GROWN IN THE CONDITIONS OF CHUI VALLEY

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DOI: https://doi.org/10.31435/rsglobal_ws/30122022/7896

ARTICLE INFO

Received: 10 December 2022
Accepted: 27 December 2022
Published: 30 December 2022

KEYWORDS

Soybean, Different Soybean Species, Comparative Analysis, Biochemical Composition Of Seeds.

ABSTRACT

The article reflects the main indicators of the chemical composition of American and Russian soybean species seeds. In 2019 y., field experiments and research have been carried out in the conditions of Chui Valley. Nowadays it is considered that soybean - major source of plant protein and it occupies a leading position in the production of vegetable oil in world production. Its biochemical composition of seeds is rich and varied depending on the species. In the course of the research, we studied the biological and morphological characteristics of the tested soybean species. At the end of its growing season and physiological ripeness, a crop was harvested from these species - Emerge 2t29, Emerge 2282, Slavia, Vilana, Ultra. The number of proteins, lipids, and carbohydrates, as well as the qualitative composition of these groups of substances in soybean seeds, vary significantly depending on the varietal characteristics and cultivation conditions of the crop. After researching and comparing, we can conclude that American species are superior to others in protein content, and Russian varieties are superior in fat content in seeds. In this connection, it can be recommended to local agronomists to cultivate it in large volumes, considering with the conditions.

Citation: Biimyrsaeva Aidana Kamchybekovna. (2022) The Results of Comparing the Parameters of Biochemical Composition of Different Soybean Species Seeds, Grown in the Conditions of Chui Valley. *World Science.* 6(78). doi: 10.31435/rsglobal_ws/30122022/7896

Introduction.

Among legumes, the most valuable in terms of protein content is fodder beans, where seeds contain up to 30-35% protein often. The high nutritional value of beans also lies in their increased productivity, which is expressed in high yields.

It is known that soybean belongs to the legume family (Fabaceae), which is characterized by a high content of proteins in the seed and green mass. These plants have nodules on their roots. Legumes have the property of being in symbiosis with nodule bacteria, which can fix nitrogen from the air. After all, soybean is influenced by soil and other factors and has a variety of variability in protein accumulation.

The biological value of legumes as food and fodder crops is indicated by the high (22-40%) protein content in the seeds, depending on the crop variety. Legumes are dicotyledonous plants. The seeds of leguminous plants do not have a spare nutrient tissue (endosperm) characteristic of cereals. In soybean, endosperm residues in the mature state are preserved and distinguishable. Cotyledons contain reserve substances - starch, proteins, and fats [1].

Legumes are high in essential amino acids. The protein contained in soybean seeds is similar in chemical composition to animal proteins. Soybeans contain 38.4% protein, and 18.6% fatty oil. The aminoacidic composition of soybean protein is close to the mixture of meat amino acids, that’s why it

is called vegetable meat. The soybean composition contains high-grade proteins with a complete and nutritional value as high as that of proteins of animal origin.

Beans - valuable vegetable, fodder, and green manure crop. Among vegetable crops, they are leading in terms of protein and amino acid content. Bean protein is as valuable as meat protein [2].

Purpose of the study: compare the indicators of the biochemical composition of seeds of American and Russian soybean species.

Materials. The research was carried out in 2019 in Kant city of Chui Valley, from April to October. For the field experiment, American species were taken - Emerge 2t29, Emerge 2282 and Russian species - Slavia, Vilana, Ultra.

Methodology. These soybean species were sown by randomization. Agrotechnical methods and sowing dates were chosen to take considering with conditions of Chui valley, where the predecessor of soybean was a vegetable crop. At the end of the physiological ripeness of the plant and the maturity of the seeds, a crop was harvested from the experimental plot. After that, soybean seeds were used to determine some important parameters of the chemical composition. For it, the mass fraction of moisture was determined by the "Express - method using the analyzer Sartorius Germany MA - 150". Protein content in seeds was determined by using the express method on an Inframatic8600 infrared analyzer from Perten Instruments AB, Sweden; fats were also determined by using the express method on an Inframatic8600 infrared analyzer from Perten Instruments AB, Sweden.

The discussion of the results. Proteins are the main form of nitrogen-containing compounds in mature soybean seeds. For part of extractive nitrogenous substances accounts for 15-20% of total nitrogen, and the insoluble residue is no more than 5%. A feature of soybean proteins is a high concentration of lysine (an average of 6 g per 100 g of protein) - an essential amino acid, the deficiency of which is found in most vegetable proteins [3]. During the growing of this plant culture, all species (American and Russian) were sown under the same conditions and dates. Our studies have shown that Emerge 2282, and 2t29 have 9.3 - 9.4% moisture, and the protein content is 39.7 - 39.8%. Along with these, species from Russia were brought for growth. The data we received indicate the difference between the same indicators. For instance, in such species, Slavia, Ultra, Vilana the percentage of moisture varies from 7% to 10.5%, and the percentage of proteins is 36.9% - 38.7% (table №1).

Table 1. The most important indicators of the biochemical composition of soybean seeds

American soybean species seeds			
Soybean	**Moisture content, %**	**Protein content, %**	**Fats, %**
Emerge 2282	9,3	39,7	11,9
Emerge 2t29	9,4	39,8	12,1
Russian soybean species seeds			
Soybean	**Moisture content, %**	**Protein content, %**	**Fats, %**
Slavia	10, 5	38,7	15,1
Ultra	7, 0	36,9	18,2
Vilana	8, 7	37,3	14,3

A secondary indicator is a fat content in soybean seeds. Fats are an energy material. Vegetable fats are called oils. Soybean is not only a source of protein but also oil, the seed of which contains 16-27%. Due to a large number of soybean seed production, soybean oil is assigned a leading position in the world production of vegetable oils - 32,8%. Lipids are insoluble in water and the components of the cell are extracted by solvents. In our studies, the average fat content in American was 12%, and in Russian 15.6%. Comparatively, according to Petibskaya V.S. data in American soybean species seeds lipids take 22.1%, and in national local seeds 24.3% [4].

Conclusions.

The amount of proteins, lipids, and carbohydrates, as well as the qualitative composition of these groups of substances in soybean seeds significantly, fluctuates depending on the varietal characteristics and cultivation conditions of the crop. Our data indicate different indicators of the biochemical composition of soybean seeds depending on the species. After researching and comparing, we can conclude that American species are superior to others in protein content, and Russian species are superior in fat content in seeds. Since, first of all, protein is the main source of vegetable protein, foreign (American) species can be offered to agronomists for cultivation and distribution in large volumes throughout the republic.

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