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INDICATORS OF ECONOMIC VALUE TRAITS OF ALFALFA BREEDING MATERIALS

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Abstract. The article presents the results of laboratory studies on plant foliage, moisture content, fat and protein content in alfafa hay from breeding materials.

Key words: alfalfa, variety, material, standard, selection, nursery, plant, foliage, moisture, fat, protein, hay.

Introduction. Alfalfa plays a significant role in solving the problem of providing livestock with feed protein and improving soil fertility. Alfalfa green mass and all its processed products are valuable protein -vitamin feeds with a high content of many It contains essential amino acids and is readily palatable by all types of animals and birds. Alfalfa is also the best precursor for most agricultural crops. A highly productive crop with stable yields and nutrient yields, alfalfa also distinguishes itself from other crops by its early spring regrowth, which is essential for livestock production.

Alfalfa region has a very high nutritional value due to while a deep root system can help prevent moisture loss in dry soils [9].

P ro f es s o r B.P. Pleshkov claims that in alfalfa on average from dry matter, the content of crude protein without irrigation is 19.4 %, with irrigation – 17.4 %, fiber 21.2 and 25.2 %, respectively [4].

An important economically valuable trait of alfalfa is the protein content of its hay, which determines the nutritional value of the feed unit. Alfalfa is one of the legume crops intended for a diverse nutrient conveyor for livestock and poultry farming. Typically, alfalfa is mown for hay 1-2 times on dryland, and 4-6 times on irrigated lands. One hectare of alfalfa yields 60-75 c/ha of feed unit and 14-19 c/ha of digestible protein [7]. Research conducted in the Udmurt Republic shows that, among crops grown for animal feed, alfalfa has the highest crude protein content – 11.9%. The chemical composition and nutritional value of alfalfa positively influence the growth and development of animals. Alfalfa plants contain more digestible protein, minerals and carotene compared to other forage crops [8].

Scientists confirm that the protein content in hay in both samples and hybrids varies to varying degrees depending on the genotype of the parental forms and hybrid combinations. However, seasonal conditions have a significant impact on variability from year to year. A high heterosis effect was observed in reciprocal $F_{1\ hybrids}$ from the cross k-38382 (Drylander, Canada) and k-38457 (Local, Tanzania), although these forms did not differ significantly in protein content [6]. The polyhybrid variety Tashkentskaya-1728 exceeds the zoned variety Tashkentskaya-1 in hay yield by 8.7%, protein content by 1.8-2.0%, and carotene by 10-15 mg/kg. It is characterized by high foliage, thin stems, and resistance to aphids [5].

Pre-sowing treatment of alfalfa seeds and plants with growth regulators of the sym-triazine series contributed to an increase in the protein content in the vegetative mass of alfalfa by 3.2-4.6% [1].

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Materials and methods. The studies were conducted in the laboratory of alfalfa breeding and seed production at the Research Institute of Agricultural Sciences and Agriculture in 2025. The nursery for the selection of breeding materials was established using a laboratory small-sized manual seeder according to the methodology "Methodological instructions for conducting field experiments with forage crops " [3] with continuous row sowing at a seed seeding rate of 16 kg / ha on plots of 4 m2 (0.8 x 5 m) in four replicates. The main economically valuable traits were determined in the laboratory for 6 alfalfa breeding materials in comparison with the standard variety Tashkentskaya-1. The obtained data were processed using the analysis of variance method [2]. Laboratory analyses were carried out using the SAP device NIR 2700 according to GOST IS O 659 [10].

Research results. In this laboratory study, hay moisture, plant foliage, fat and protein content were determined (Table 1). According to hay moisture, the breeding materials C-3192 (k-6192 Teton, USA), C- 3244 (Kayseri Ankara, Turkey) and C-3247 (k-6861 MA-414 Ankara, Turkey) exceed the standard variety Tashkentskaya-1 by 2.69%, 0.80% and 0.95%, respectively. The indicators of the breeding materials C-3249 (K-6863 MA-324 Ankara, Turkey), C-3331 (MA-525 HQ Ankara, Turkey) and C-3152 (C-2945, Ecuador) are below the standard by 0.33-0.60%. The fat content in hay of the standard variety was 8.32%, and in the breeding materials from 8.05% to 8.60%. According to this feature, the indicators of the standard and breeding materials did not differ significantly.

Table 1

Foliage, fat and protein content of alfalfa breeding materials (2025)

Catalog number and sample name	Hay moisture content, %	Content fat, %	Foliage, %	Content protein, %					To standard, %
				I	II	III	V	Average	
Tashkentskaya-1 - standard	28.25	8.32	2.1	16.23	18.88	15.01	:30 PM	16.93	100.0
S-3249 k-6863 MA-324 Tour	27.65	8.34	3.9	18:40	21.41	16.49	6.73	18.32	108.2
C-3192 k-6192 Teton, USA	30.94	8.05	2.4	17.14	19.93	17.54	6.58	17.56	103.7
C-3244 Kayseri Ankara, Tours	29.05	8.28	3.1	16.61	19.32	16.32	6.09	17.03	100.6
C-3331 MA-525 HQ Tour	27.92	8.11	2.9	18.74	21.80	16.23	6.38	18.32	108.2
C-3247 k-6861 MA - 414 Tour	29.20	8.10	0.9	16.60	19.31	14.47	5.98	16.97	100.2
C-3152 C-2945, Ecuador	27.92	8.60	0.8	17.52	20.38	17.76	7:00	17.97	106.1

m = ± 0.31 md = ± 0.43 P = 4.21

The most significant traits of alfalfa are the foliage of plants, as well as the protein content in the hay, which determines the feed unit of alfalfa. From the obtained research results and literary sources, we know that protein is contained more in the leaves of plants than in the stems, therefore, the study of the above trait is significant in the feed production of farm animals.

According to laboratory analysis, the average foliage index for four replicates of the standard variety Tashkentskaya-1 was 42.1 %. For this trait, breeding materials C-3331 (MA-525 HQ Ankara, Turkey), C-3192 (k-6192 Teton, USA), C-3244 (Kayseri Ankara, Turkey) and C-3249 (K-6863 MA-324 Ankara, Turkey) superiority over the standard from 0.3% to 1.8%. The highest foliage of plants was found in Turkish samples C-3249 and C-3244, in which the foliage was 43.9% and 43.1%, respectively.

In our studies, biochemical analyses confirmed that the protein content in hay of the standard variety Tashkentskaya-1 was 16.93%. According to this trait, the breeding materials C-3249 (K-6863 MA-324 Ankara, Turkey), C-3192 (k-6192 Teton, USA), C-3331 (MA-525 HQ Ankara, Turkey) and C-3152 (C-2945, Ecuador) had a protein content in hay of 18.32%, 17.56%, 18.32% and 17.97%, which exceeded the standard by 3.7-8.2%, which is a good indicator for new breeding materials.

C-3249 (K-6863 MA-324 Ankara, Turkey), C-3192 (k-6192 Teton, USA), C-3331 (MA-525 HQ Ankara, Turkey) and C-3152 (C-2945, Ecuador) breeding materials are superior to the standard Tashkentskaya-1 variety in terms of a set of characteristics that determine the quality of alfalfa feed.

Conclusions. It was determined that in terms of foliage of plants in breeding materials C-3331, C-3192, C-3244 and C-3249 superiority over the standard variety Tashkentskaya-1 from 0.3% to 1.8% ;

– biochemical analyses confirm that the protein content in hay of the standard Tashkentskaya-1 variety was 16.93%, and in the selection materials C-3249, C-3192, C-3331 and C-3152 it was 18.32%, 17.56%, 18.32% and 17.97%, respectively;

– it was revealed that the breeding materials C-3249 (K-6863 MA-324 Ankara, Turkey), C-3192 (k-6192 Teton, USA), C-3331 (MA-525 HQ Ankara, Turkey) and C-3152 (C-2945, Ecuador) were superior to the standard variety Tashkentskaya-1 in a set of economically valuable traits that are of interest in alfalfa breeding for the creation of new varieties with high yield and feed quality.

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10. GOST IS O 659 Determination of the content of proteins, fats and other parameters in the composition of plants.