AGROBIOLOGICAL EVALUATION OF OILSEED CROPS UNDER RAINFED CONDITIONS IN UZBEKISTAN

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Abstract: This article presents data from breeding work on oilseed crops such as flax under rainfed conditions of Uzbekistan. The results include data on oil content and yield of new varieties.

Keywords: flax, seeds, rainfed, yield, oil content, number of capsules, heads, 1000-seed weight.

Introduction. The Development Strategy of the Republic of Uzbekistan until 2030 gives special attention to food security, the supply of food products to the population, and the rational use of both non-renewable and alternative energy resources. These goals are to be achieved through the development and application of scientifically based recommendations for the efficient use of natural resources.

In rainfed regions of the country, the main oilseed crops grown are safflower, flax, and sesame. These crops are major sources of vegetable and industrial oils. Additionally, their by-products—meal and cake—are used as high-quality animal feed in the fodder industry, on farms, and in the private sector.

Due to global climate change, dry years and long periods of drought are becoming more frequent. As a result, the total seed harvest of oilseed crops is decreasing, and the region is facing a shortage of vegetable oil.

Oil flax is a valuable multi-purpose agricultural crop. Cultivated flax belongs to the species Linum usitatissimum L. of the flax family. There are five morphological and economic types of cultivated flax: fiber flax, intermediate types, curly types, large-seeded, and trailing types.

Flaxseed meal and cake are concentrated animal feeds rich in protein—comparable to rapeseed cake. According to I.A. Minkevich (1957), flax seeds contain 25–45% oil and up to 30% protein. They also contain up to 5% nitrogen, 4% ash, and 4.5% fiber. One kilogram of flaxseed meal contains 1.14 feed units and 285 g of digestible protein.

Flaxseed oil includes 16–20% oleic acid, 14–17% linoleic acid, 50–60% linolenic acid, 5–7% palmitic acid, and 3–4% stearic acid.

Recently, global interest in flaxseed oil has grown due to its health benefits, particularly its high content of linolenic acid. One of the current challenges in flax cultivation is obtaining high-yielding varieties with high oil content and improved oil quality. Flaxseed oil improves metabolism, reduces

cholesterol, normalizes blood pressure, and lowers the risk of tumors. It is also used to prevent cardiovascular diseases and to help treat diabetes.

At the Gallaorol Scientific Research Institute of Rainfed Agriculture, the following varieties have been developed: Milyutinsky-114, Gallaorol, and Jizzakh-1 safflower varieties, and Bakhmal-2 and Bakhorikor flax varieties.

Materials and Methods. The research was carried out on oil flax varieties in competitive trials under rainfed conditions at the Scientific Research Institute of Rainfed Agriculture.

The varieties were evaluated using the methods of the State Commission for Variety Testing of Oilseed Crops (1985). Plot size was 25 mI, with four replications. Sowing was carried out in the 1st–2nd decades of March.

Results of the Study. According to literature review, despite the advantages of oilseed crops, flax is still insufficiently studied in terms of agrotechnical aspects.

This is likely due to limited research under various climatic and agrotechnical conditions. As shown in Table 2, the yield of oilseed crops varies from year to year depending on these conditions.

Table 1.

Yield of main oil flax varieties under rainfed conditions

(Gallaaral 2017-2021.)

№	Varieties	Yield s/ha					
		2017	2018	2019	2020	2021	average
Oil flax							
1	Bakhorikor	7,2	7,5	8,0	7,8	8,1	7,7
2	Lalmikor	8,7	8,7	9,3	9,2	9,5	9,0

In the competitive variety trials of flax over five years of research, the average yield of the oil flax variety Lalmikor was 9.0 centners per hectare, while the standard variety Bakhorikor yielded 7.7 centners per hectare.

As early as 1971, P.M. Zhukovsky noted that flax seeds can accumulate up to 60% vegetable oil, and the fruits up to 37%. According to data from the Ministry of Agriculture of Uzbekistan, the share of imported edible vegetable oils in the country reaches 40–45%. Increasing domestic production of vegetable oil is possible primarily by expanding the cultivated areas of major oilseed crops under rainfed conditions.

Table 2.

Oil content of main oil flax varieties under rainfed conditions

(Gallaaral 2017-2021.)

№	Varieties	Выход масла в семенах, %					
		2017	2018	2019	2020	2021	average
Oil flax							
1	Bakhorikor	37,02	36,27	37,56	36,6	37,02	36,8
2	Lalmikor	-	38,25	39,35	38,09	39,7	38,8

Conclusion. Based on five years of research on oil flax varieties, the Lalmikor variety showed the highest breeding value. Depending on weather conditions, it outperformed the standard varieties in terms of both yield and oil content under rainfed conditions.

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