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ECONOMICALLY VALUABLE TRAITS OF SAFFLOWER AND OIL FLAX IN RAINFED CONDITIONS OF UZBEKISTAN

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Abstract
The article presents an analysis of the research results breeding varieties safflower and flax crops rein fed conditions.

Keywords: Variety, rain fed, safflower, flax, seed production, progeny, line, standard, yielding.

Introduction

Currently, in the breeding of oilseeds, the creation of new early-ripening, high-yielding varieties that require little water and are resistant to environmental stress factors and the introduction of technologies for their cultivation into production is one of the pressing problems. Safflower and flax are plants that are heat and drought tolerant and are grown in more than 60 countries around the world, mainly in India, Mexico, USA, China, Iran, Egypt, Australia, Argentina, Russia and Kazakhstan, covering an area of 4.5 -6.8 million, ha.

According to data provided by the Ministry of Agriculture of Uzbekistan, the share of imports of edible vegetable oils reaches 40-45%. Increasing the volume of production of our own vegetable oil only by increasing the area of cultivation of the main oilseed crops in rain-fed conditions.

Currently, the breeding strategy at the present stage is aimed at increasing the tolerance of the created varieties to changing abiotic and biotic stresses with a high level of productivity and quality.

Safflower is a heat-loving and very drought-resistant short-day plant, well adapted to the dry continental climate. In rainfed conditions of Uzbekistan, it is necessary to complete sowing of safflower before the end of March, when the soil has the required amount of moisture. Early sowing has the advantage that the flowering phase of safflower coincides with the period when there is still sufficient moisture reserves in the soil. Sh.H. Aripov, (2017) [1; 21.25].

Scientists involved in the selection of oilseeds at the Research Institute of Rainfed Agriculture are conducting a number of questions to study the morphological

characteristics, biological characteristics and economically valuable characteristics of safflower and oil flax to create high-yielding varieties that are resistant to environmental stress factors.

Materials and methods

The varieties of competitive testing of safflower and oil flax in rainfed conditions of the Scientific Research Institute of Rainfed Agriculture served as research material. The study of KSI varieties of safflower and oilseed flax was carried out according to the methods of the State Commission for Variety Testing of Agricultural Crops (1985) and according to the Methodology of Field Experience (Dospehov, 1985).

Results of the study

In the nursery of the competitive variety testing, 12 safflower varieties were sown in 4 repetitions (25 m2). In the nursery for competitive variety testing there are 10 varieties of oilseed flax in 4-fold repetition (25 m2), the sowing period is 1-2 ten days of March.
In the conducted research, 2021 was characterized by less precipitation (187.4 mm) in conditions of high air temperatures, which exceeded the long-term norm by 3-8 0C and moisture deficit throughout the entire growing season, safflower and oil flax plants formed a low seed yield during the growing season in comparison with 2022 (389.5 mm) and 2023 (363.7 mm), with an average annual precipitation of 361.9 mm. In 2022, the rainfall in March was 173.6 mm. They contributed to the emergence of friendly shoots of safflower and oil flax. In the competitive variety testing over the years of research, the safflower varieties Jizzakh-1, Moidor, 2018/8, 2021/1, and 2021/2 distinguished themselves by the number of baskets and seeds in the basket. (Table 1).

Table 1. **Main indicators of competitive variety testing safflower varieties on rainfed soil (Gallyaaral, 2021-2023)**

№	Variety name	Number of branches from one plant pcs.				Number of baskets per plant pcs.				Number of seeds in one basket pcs.			
		2021	2022	2023	x	2021	2022	2023	x	2021	2022	2023	x
1	**Milyutin-114**	5	8	6	6	15	22	20	19	25	29	21	25
2	Gallaaral	4	6	5	5	12	19	23	18	27	32	26	28
3	Jizzakh-1	7	9	8	8	17	24	21	21	29	36	31	32
4	Moydor	6	10	7	8	14	28	25	22	21	42	35	33
5	2018/4	5	7	6	6	11	19	18	16	28	36	29	31
6	2018/8	6	9	8	8	18	31	27	25	36	43	38	39
7	2018/10	6	8	6	7	21	29	23	24	28	33	30	30
8	2021/1	7	8	7	7	15	27	23	22	28	35	32	32
9	2021/2	6	7	6	6	16	23	19	19	31	38	41	37
10	Shahjulduz	-	-	6	6	-	-	22	22	-	-	27	27

In the competitive testing of safflower varieties over three years of research, varieties were selected according to yield 2018/4 (8.6 c/ha), 2018/8 (8.2 c/ha), 2021/1 (8.1 c/ha),

Jizzakh- 1 (7.8 c/ha), Shahzhulduz (7.5 c/ha), the standard has 6.7 c/ha (Milyutin-114) (Table 2).

Table 2. **Economically valuable traits of safflower varieties in competition variety testing on rainfed land (Gallyaaral, 2021-2023)**

№	Название сорта	Productivity, c/ha				Weight of 1000 grains, G				Oil content, %			
		2021	2022	2023	x	2021	2022	2023	x	2021	2022	2023	x
1	**Milyutin-114 st**	5,4	7,5	7,1	6,7	29,4	31,3	28,6	29,7	20,8	23,4	-	22,1
2	Gallaaral	5,1	7,0	6,8	6,3	30,3	32,8	31,3	31,4	21,6	28,2	-	24,9
3	Jizzakh-1	6,9	8,6	8,0	7,8	32,5	34,8	32,4	33,2	22,7	23,6	-	23,1
4	Moydor	5,8	7,9	7,6	7,1	33,1	34,5	33,6	33,7	21,1	23,5	-	22,3
5	2018/4	-	-	8,6	8,6	30,8	32,7	29,8	31,1	22,3	21,4	-	21,8
6	2018/8	7,6	8,8	8,2	8,2	31,3	32,9	30,2	31,4	22,0	23,7	-	22,8
7	2018/10	6,2	8,0	7,5	7,2	33,5	34,8	31,4	33,2	21,3	25,4	-	23,3
8	2021/1	7,1	8,4	8,8	8,1	30,4	34,6	33,4	32,8	21,7	22,6	-	22,1
9	2021/2	6,5	7,8	8,0	7,4	31,8	32,3	30,9	31,8	22,8	23,6	-	23,2
10	Shahjulduz	-	-	7,5	7,5	-	-	30,7	30,7	-	-	-	-

The table data also shows that the weight of 1000 safflower grains averaged 31.2 g over three years (Moidor) 33.7 g (2018/10, 2021/1), for the standard 29.7 g; oil content - from 24.9% (Gallyaaral) to 23.3% (2018/10), 23.2 (2021/2) for the standard (Milyutin-114).

Flax - this crop is characterized by excellent biological and economic qualities, namely high drought resistance, a short growing season, manufacturability of production, high yields and profitability I.A. Minkevich A.I (1957) [2; 135-138].

E.N. Sinskaya (1954) [3; 125,145], From the world collection, useful characteristics are noted and the significance for the selection of varieties and forms of cultivated flax is given. From a review of the literature it follows that, despite a number of advantages of oilseeds, this crop has not been sufficiently studied in agrotechnical terms.

In a competitive variety trial, oil flax varieties were selected over three years of study based on yield: Lalmikor (8.4 c/ha), 2021/1 (8.0 c/ha), 2020/3 (8.0 c/ha), Bakhorikor (7.7 c/ha), 2021/3 (7.7 c/ha), the standard has 6.9 c/ha (Bakhmal-2) (Table 3.)

Table 3. **Main indicators of competitive variety testing of flax varieties oilseed on rainfed soil (Gallyaaral, 2021-2023)**

№	Variety name	Number of branches from one plant pcs.				Number of boxes per plant pcs.				Number of seeds in one box pcs.			
		2021	2022	2023	x	2021	2022	2023	x	2021	2022	2023	x
1	**Bakhmal-2 st**	4	6	7	6	18	28	25	24	7	8	7	7
2	Baharikor	5	6	8	6	21	30	29	27	8	8	7	8
3	Lalmikor	5	6	9	7	23	32	31	29	7	9	8	8
4	КП-2020/7	4	7	8	6	20	27	30	26	8	8	7	8
5	2021/1	6	6	10	7	25	29	35	30	8	9	9	9
6	2021/2	5	7	9	7	17	25	28	23	7	8	7	7
7	2021/3	4	6	7	6	19	27	31	26	7	8	7	7
8	2020/1	5	6	8	6	21	31	28	27	7	8	8	8
9	2020/2	5	7	7	6	20	28	33	27	8	7	8	8
10	2020/3	6		10	8	25	32	28	28	8	8	9	8

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Elementary characteristics, the number of bolls per plant and the number of bolls, are the most important indicators of seed productivity of oilseed flax. According to the table, it can be seen that the largest number of seeds in a boll of oilseed flax varied between 7-9 pieces, with an average value of 8 pieces in the experiment. The Bakhmal-2 standard had one seed per box. (Table 3).

Table 4. **Economically valuable traits of oil flax varieties in competitive variety testing on rainfed land (Gallyaaral, 2021-2023)**

№	Variety name	Productivity, c/ha				Weight of 1000 grains, G				Oil content, %			
		2021	2022	2023	x	2021	2022	2023	x	2021	2022	2023	x
1	**Bakhmal-2 st**	6,4	7,6	6,8	6,9	3,7	5,0	5,7	4,8	34,8	36,7	-	35,7
2	Baharikor	7,1	8,1	7,9	7,7	4,1	5,6	6,0	5,2	36,5	42,6	-	39,5
3	Lalmikor	7,8	8,9	8,5	8,4	4,4	5,8	5,9	5,4	36,8	42,1	-	39,4
4	КП-2020/7	6,8	7,9	7,2	7,3	4,2	5,4	5,6	5,1	34,4	37,7	-	36,0
5	2021/1	7,2	8,6	8,3	8,0	4,5	5,6	5,8	5,3	35,8	38,1	-	36,9
6	2021/2	6,8	7,2	7,0	7,0	4,1	5,1	5,6	4,9	34,9	39,2	-	37,0
7	2021/3	7,4	8,0	7,8	7,7	4,2	5,9	6,0	5,4	36,2	37,9	-	38,0
8	2020/1	6,7	7,8	8,2	7,6	4,4	5,2	5,9	5,2	33.3	36,4	-	34,8
9	2020/2	7,1	7,0	8,0	7,4	4,1	5,3	5,6	5,0	36,2	38,0	-	37,1
10	2020/3	7,5	8,4	8,2	8,0	4,6	5,3	5,9	5.3	35,8	37,7	-	36,7

According to the table, for oil flax the weight of 1000 grains averaged 5.2 g for varieties, (Bakhorikor, 2020/1) 5.4 g, (Lalmikor, 2021/3), for the standard 4.8 g (Bakhmal-2); oil content - from 34.8% (2020/1) to 39.5% (Bakhorikor, Lalmikor), the standard has 35.7% (Bakhmal-2).

Conclusions

Based on the results of a three-year study, a variety with high economically valuable characteristics of the variety and variety samples of safflower Zhizzakh-1, Moidor, 2018/8, 2021/1, and 2021/2 were identified and the oil flax varieties Lalmikor, Bakhorikor, 2021/2, 2021/2, were identified with the greatest breeding value. 2020/3, 2021/3, which in terms of yield and oil content, depending on weather conditions, exceeded the standard in rain-fed conditions for these indicators.

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