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Main results of safflower breeding in rainfed conditions

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Abstract: This article presents the results of safflower selection in rainfed conditions. During the study of the collection and breeding nursery, new lines of safflower were selected for economically valuable properties.

Keywords: Variety, rainfed, culture, safflower, seed production, progeny, line, standard, yield, oil content.

Introduction: In recent years, in order to meet the needs of the population of the republic with local food products, the area for cotton and grains has been reduced, and on the liberated lands, areas have been allocated for planting fruits, vegetables, fodder and oilseeds. An important direction today is to conduct scientific research on the creation of new breeding varieties of oilseeds, the creation of highly productive varieties that have large amounts of oil in the seeds, high quality products, are resistant to various abiotic and biotic factors, adapted to various soil and climatic conditions of our republic [1].

Yu.A. Aripov (1967) noted that one of the main directions is the selection of initial sources and the use of breeding processes in the creation of high-yielding varieties of oilseeds that are resistant to abiotic and biotic factors in rainfed conditions. Safflower is one of the ancient types of oilseeds, capable of growing even in harsh conditions, differing from other oilseeds in its resistance to cold and drought [2].

In studies conducted by Sh.H. Aripov (2017), attention to the amount of oil obtained from them when creating new varieties of safflower determines the direction of their industrial use and increases their value, and also ensures the genetic homogeneity of the varieties [3].

Purpose of the study: The purpose of the study is to create new varieties of safflower that are resistant to diseases and pests, and have a high oil content in the seeds, for sowing in rainfed conditions.

METHODS

The study was carried out on rainfed conditions at the Research Institute of Rainfed Agriculture, all analyzes and calculations were carried out on the basis of introduced methods.

The study of world collections and breeding materials was carried out according to the methodology of VIR (1976) Moscow. Phenological observations, assessments and analyzes for various indicators in field and laboratory conditions were carried out on the basis of methodological recommendations of the State Commission for Varietal Testing of Oilseeds. Issue three (1983). Statistical analysis of the digital results obtained in the experiments was performed according to the method of B.A. Dospehova (1985) [4].

RESULTS AND DISCUSSION

Sowing experiments were carried out in the first and second half of March (March 16-21) at optimal times. During the period from germination to full ripening, branching, budding, flowering, resistance to rust and pests and the timing of full ripening, safloraphenological observations were carried out according to the methods.

Sowing of variety samples in collection and selection nurseries was carried out on an area of 1 m2 according to the number of seeds, by hand planting from 1 row to 2 meters in length, a standard variety was sown after

10 rows.

In the year under study, weather conditions in March were somewhat unfavorable compared to previous years (-39.9 mm of precipitation during the growing season), while the amount of precipitation in this month (87.2 mm) compared to the long-term average (65.0 mm), +22.2 mm more, but in April more (53.6 mm) than the annual norm (21.6 mm), less than the average air temperature, low temperatures were noted. During the growing season, the total amount of annual precipitation was 322.1 mm, and it was observed that the precipitation varied according to the development of crop elements (the number of branches, the number of baskets, the number of seeds in the basket).

Table 1.
Economically valuable characteristics of safflower in the collection nursery
(Gallaaral , 2024y)

№	Sample number, origin	Growing season, day	In one plant				Productivity c/ha	Weight of 1000 grains, g
			Plant height, cm	Height main branches, cm	Number of baskets, pcs.	Seed basket pcs		
1	**Jizzak-1 st.**	118	85,2	21,4	9	17	7,1	32,4
2	Nc76744 (Aljir)	114	70,9	27,0	12	21	7,9	32,8
3	Nc76749 (Avstraliya)	118	80,5	25,8	10	26	8,9	33,6
4	Nc76751 (Kazakistan)	114	75,1	31,0	14	32	8,2	31,8
5	K-76749 (Avstriya)	112	78,4	29,3	12	28	7,9	32,3
6	K-76754 (Polsha))	114	70,5	23,0	15	34	8,5	35,1
7	K-76750 (Marokko)	116	75,5	21,4	12	28	6,7	33,2
8	K-30811 (Azerbayjan)	112	72,4	23,5	11	31	6,8	32,5
9	K-78485 (Fransiya)	107	69,1	27,6	15	36	8,7	34,8
10	K-33057 (Portugaliya)	110	71,2	26,5	13	38	7,8	33,5
11	**Jizzak-1 st.**	116	78,6	21,3	10	25	6,9	32,8
12	K-30723 (Uzbekiston)	108	78,8	29,4	12	34	7,3	31,5
13	K-30757 Meksika	106	71,8	23,9	10	33	7,0	34,2
14	K-78589 (Yegipet)	112	75,0	26,6	9	29	6,9	35,3
15	K-7826 (Avstraliya)	113	72,3	22,2	11	36	7,5	31,6
16	K-30818 (Polsha)	114	82,1	27,0	9	33	8,8	34,6
17	K-30740 (Marokko)	112	68,4	25,8	13	41	8,4	33,1
18	K-30757 (Pakiston)	108	70,5	24,1	12	34	7,7	36,6
19	K-30809 (Chexoslovakiya)	109	79,3	26,8	12	32	7,3	33,5
20	K-30773 (Efiopiya)	114	77,3	27,0	14	39	7,8	32,1
21	**Jizzak-1 st.**	118	71,4	21,4	12	31	7,2	32,6
22	K-30737 (Vengriya)	110	72,3	26,1	11	35	7,2	34,4
23	K-30744 (Avstraliya)	116	73,6	21,4	15	33	8,0	34,6
24	K-30692 (Afganistan)	116	69,5	26,7	12	32	7,3	35,7
25	K-30681 (Kazakistan)	114	77,6	26,0	13	39	8,1	34,3
26	K-30631(Tursiya)	116	73,4	22,3	16	34	8,2	35,8
27	K-30615 (Afganistan)	112	75,6	25,5	13	37	8,9	34,4

Based on the results of research in the collection nursery, samples K-30757 (Pakistan), K-78589 (Egypt),

K-30692 (Afghanistan), K-30744 (Australia), K-30737 (Hungary), K. -30818 (Poland) were selected in comparison with standard varieties Zhizzak-1 "0.8-1.8 c/ha higher (7.0 c/ha) by weight of 1000 seed grains 2.5-3.0 g higher. Also, the productivity of the main plant (number of branches, number of baskets, number of grains in baskets, height of the main stem), samples Nc-76749 (Australia), Nc-76751 (Kazakhstan), K-76754 (Poland), K-78485 (France), K-30818 (Poland), K-30740 (Morocco), stood out. K-30744 (Australia), K-30681 (Kazakhstan), K-30631 (Turkey), K-30615 (Afghanistan), K-30681 (Kazakhstan), K-30615 (Azerbaijan).

Safflower breeding nursery: In the reporting year, 138 safflower samples were studied in the breeding nursery. In the experiments carried out, the beginning of plant germination (10%), complete germination (75%), the beginning of budding, the beginning of flowering (10%), full flowering (75%), seed ripening (10%), the physiological development of seeds (development time 75%) was determined in the field.

In the experiments, it was noticed that the number of harvest baskets of varietal samples varies depending on the quality of the agrotechnical measures used. Among the 138 studied varietal samples in the safflower breeding nursery, it was found that the number of baskets on the plant was low in 29 (5-9), average in 52 (11-13) and high in 57 (14).

Table 2.

The main economically valuable characteristics of safflower in a breeding nursery. (Gallaaral, 2024 y)

№	Sample varieties name	Plant height (cm)	Number of branches per plant (pcs.)	Number of baskets per plant (pcs.)	Productivity c/ha
1	**Jizzak-1**	71,4	6	18	7,1
2	СП/5	75,6	7	17	8,6
3	СП/8	70,4	6	19	7,4
4	СП/14	73,6	8	21	8,0
5	СП/21	81,5	6	27	8,9
6	СП/35	72,4	7	17	7,8
7	СП/39	74,6	8	15	7,1
8	СП/41	86,3	9	13	6,9
9	СП/47	78,6	7	28	8,5
10	СП/56	68,9	6	20	7,5
11	**Jizzak-1**	70,2	7	16	7,4
12	СП/63	82,6	8	29	9,0
13	СП/78	75,9	7	16	6,7
14	СП/89	70,1	6	23	7,6
15	СП/91	78,9	5	24	8,3
16	СП/97	74,6	7	27	8,6
17	СП/111	86,7	9	19	7,5
18	СП/115	80,2	5	15	7,0
19	СП/118	82,5	7	18	8,7
20	СП/120	75,8	9	31	9,2
21	**Jizzak-1**	72,4	8	19	6,5
22	СП/131	75.8	7	28	9,1
23	СП/136	73,5	6	19	8,3

When studying the height of the plant samples, varieties stood out as SP-111-86.7 cm, SP/25-81.5 cm, SP/41-86.3 cm, SP/63-82.3 cm, compared to the standard varieties Zhizzak-1 (above 8-12 cm). In terms of the number of baskets and yield, varieties SP-97, SP-91, SP-21, SP-118, SP-131, SP-47, SP-120 and

SP136 (4-6 pieces) stood out; it has been proven that it is more formed and the yield is higher by 1.5-1.8 c.

CONCLUSIONS

In the collection nursery of safflower, based on phenological observations and morphological characteristics, including stem, leaf shape, shape of fruit heads, cover with thorns, color of golden leaves. Based on the research results, primary sources on various areas of selection were extracted from them. As a result of a comprehensive study of the samples, 18 samples were selected by the number of baskets, 12 samples by the productivity of one plant, 11 samples by seed size, and 19 samples were selected. Considering that the number of seed heads, the number of seeds and the size of the seeds are one of the main and important factors affecting yield, the number of seed heads varies depending on the varieties and quality of agricultural products. It was proven that the number of heads per plant was low in 29 samples (5-9), medium in 52 samples (11-13) and high in 57 samples (14).

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