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STUDY OF THE GROWTH PERIOD OF LENTIL VARIETIES AND LINES AND SELECTION OF PRODUCTIVE GENOTYPES

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Abstract: The lentil plant is grown for food purposes, it is superior to all leguminous crops due to its quick-dissolving protein content, high palatability, and ease of digestion. Grains and flour are used in the preparation of various cuisines. Lentils are also used as fodder crops. For feed, its grain, straw, waste - pulp is used. Lentils, like other leguminous crops, enrich the soil with nitrogen and are considered a good successor crop. Lentils contain 21.3-36.0 percent protein, 0.7-1.4 percent fat, 2.5-3.6 percent ash, 43.8-53.9 percent starch, 2.7-4.5 percent cell is available.

Key words: Lentil, genotype, variety, line, growing season, maturity.

Lentils enrich the soil with nitrogen, After lentils, the field remains clean. Even for planting lentils, the field must be free of weeds. Planting winter lentils after autumn grain crops - potatoes, corn, sugar beet - gives good results. It is not recommended to plant in areas where leguminous plants are planted, because diseases and pests multiply. Planting after sunflower and in desert areas also does not give good results [4, 6, 12, 14].

Low soil moisture during planting often has a negative effect on seed germination and results in uneven seedling emergence, which in turn affects seedling thickness and reduces yield [3, 5, 8, 10, 13].

Lentils, planted as a cool-season crop and delayed in planting, will become stunted if temperatures are high. Lentils need low temperatures during growth and warm temperatures when mature. The best temperature for its optimal growth is 18-30 ℃ [2, 7, 9].

During the flowering period of lentil, high air temperature at 25 ℃ will cause impaired pollen germination, increase of abnormal pollen tubes and pollen breakage. A dramatic effect on lentil pod development and seed filling has been shown[15].

The ability of lentils to fix nitrogen improves the nutrient status of the soil, which in turn ensures the stability of production. Lentils are traditionally grown in semi-arid areas and often experience drought during the growing season due to limited and erratic rainfall, leading to acute water scarcity and increased drought [1, 11].

20 cultivars and ridges of lentil were planted in 200 seeds in 3 rows on 10 m2 area in the irrigated experimental field area of Guzor Department of Southern Agricultural Research Institute. Field planting of varieties and ridges was done by hand on 25.02.2022 (Table 1).

Table 1

Field fertility of lentil cultivars and ridges in a competitive cultivar trial nursery, Guzor-2022.

№	Name of variety	Planting date	Germination, date	Field germination, %		
				Planting seeds	Germination seeds	Germination, %
1	**Darmon (check)**	25.feb	05.march	200	184	92
2	**Sarbon (check)**	25.feb	06.march	200	180	90
3	KR20-LIEN-E-07	25.feb	06.march	200	191	95
4	KR20-LIEN-E-08	25.feb	06.march	200	188	94
5	KR20-LIEN-E-10	25.feb	07.march	200	190	95
6	KR20-LIEN-E-11	25.feb	07.march	200	181	91
7	KR20-LIEN-E-13	25.feb	06.march	200	188	94
8	KR20-LIEN-E-18	25.feb	07.march	200	188	94
9	KR20-LIEN-E-25	25.feb	07.march	200	182	91
10	KR20-LIEN-L-01	25.feb	07.march	200	190	95
11	KR20-LIEN-L-04	25.feb	06.march	200	185	93
12	KR20-LIEN-L-06	25.feb	05.march	200	189	94
13	KR20-LIEN-L-09	25.feb	06.march	200	184	92
14	KR20-LIEN-L-10	25.feb	06.march	200	184	92
15	KR20-LIEN-L-14	25.feb	07.march	200	186	93
16	KR20-LIEN-L-16	25.feb	06.march	200	189	95
17	KR20-LIEN-L-18	25.feb	06.march	200	187	93
18	KR20-LIEN-L-22	25.feb	07.march	200	184	92
19	KR20-LIEN-L-23	25.feb	07.march	200	189	95
20	KR20-LIEN-L-25	25.feb	06.march	200	186	93
Minimum		**25.02.22**	**05.03.22**	**200**	**180**	**90**

Mean	**25.02.22**	**06.03.22**	**200**	**186**	**93**
Maximum	**25.02.22**	**07.03.22**	**200**	**191**	**95**
LSD					**2,37**
LSD %					**2,55**
CV %					**1,6**

The main goal of the research is to select new varieties and lines of lentil varieties and samples with high photosynthetic productivity, resistant to Fusarium disease, adapted to mechanization.

It was observed that the germination phase of varieties and samples fell on March 5-7 at the competitive variety testing nursery. It was found that the number of sprouted plants was 180-191 (90-95%).

According to the conducted phenological observations, it was found that the branching phase of lentil varieties and ridges was on April 5-7, the budding phase was on April 19-21, flowering was on April 27-29, pod formation was on May 9-11, and the full ripening phase was on May 24-28 (Table 2). It was observed that the vegetation period lasted for 78-83 days in lentil varieties and ridges. It was observed that 10 ridges ripened early in the varieties and ridges compared to the standard varieties.

Table 2

The growth period of lentil varieties and ridges in the competitive variety trial nursery, Guzor-2022.

№	Name of variety	Branching date	Buding date	Flowering date	Poding date	Maturity date	Vegetation period
1	**Darmon (check)**	06.apr	20.apr	29.apr	11.may	27.may	83
2	**Sarbon (check)**	05.apr	20.apr	28.apr	10.may	27.may	82
3	KR20-LIEN-E-07	06.apr	21.apr	28.apr	10.may	26.may	82
4	KR20-LIEN-E-08	06.apr	20.apr	27.apr	09.may	27.may	82
5	KR20-LIEN-E-10	06.apr	19.apr	28.apr	10.may	25.may	79
6	KR20-LIEN-E-11	06.apr	21.apr	28.apr	10.may	28.may	82
7	KR20-LIEN-E-13	05.apr	21.apr	28.apr	10.may	27.may	82
8	KR20-LIEN-E-18	06.apr	21.apr	27.apr	09.may	24.may	78
9	KR20-LIEN-E-25	06.apr	20.apr	27.apr	10.may	26.may	80
10	KR20-LIEN-L-01	06.apr	21.apr	27.apr	10.may	27.may	82
11	KR20-LIEN-L-04	06.apr	21.apr	29.apr	09.may	27.may	81

12	KR20-LIEN-L-06	06.apr	21.apr	28.apr	10.may	27.may	83
13	KR20-LIEN-L-09	06.apr	20.apr	28.apr	10.may	27.may	82
14	KR20-LIEN-L-10	07.apr	19.apr	27.apr	09.may	26.may	81
15	KR20-LIEN-L-14	05.apr	20.apr	28.apr	10.may	25.may	79
16	KR20-LIEN-L-16	06.apr	21.apr	28.apr	10.may	28.may	83
17	KR20-LIEN-L-18	05.apr	20.apr	28.apr	10.may	26.may	81
18	KR20-LIEN-L-22	07.apr	20.apr	27.apr	09.may	26.may	81
19	KR20-LIEN-L-23	06.apr	20.apr	27.apr	10.may	25.may	80
20	KR20-LIEN-L-25	05.apr	20.apr	27.apr	10.may	27.may	81
Minimum		**05.04.22**	**19.04.22**	**27.04.22**	**09.05.22**	**24.05.22**	**78**
Mean		**06.04.22**	**20.04.22**	**28.04.22**	**10.05.22**	**26.05.22**	**81**
Maximum		**07.04.22**	**21.04.22**	**29.04.22**	**11.05.22**	**28.05.22**	**83**
LSD							**2,53**
LSD %							**3,11**
CV %							**1,9**

Biometric measurements of lentil varieties and samples were carried out and monitored. The height of the lentil plant according to the returns of varieties and rows was 29-55 cm, and the location of the lower pods relative to the soil surface was 12.2-21.3 cm (Table 3). 6 ridges with higher plant height and lower pod location compared to the model cultivars were selected.

Table 3

Biometric indicators of lentil varieties and lines in the competitive variety trial nursery, Guzor-2022.

№	Name of variety	Plant height, cm				The location of the lower pods (relative to the soil surface), cm			
		Rep-1	Rep-2	Rep-3	Mean	Rep-1	Rep-2	Rep-3	Mean
1	**Darmon (check)**	35	34	34,5	**35**	16,3	17,3	16,9	**16,8**
2	**Sarbon (check)**	40	42	43	**42**	12,6	13,2	12,9	**12,9**
3	KR20-LIEN-E-07	54	54,5	55	**55**	14,2	15,3	13,8	**14,4**
4	KR20-LIEN-E-08	38	36,5	37	**37**	18,6	19,4	19,1	**19,0**
5	KR20-LIEN-E-10	45	46	45	**45**	20,3	18,2	19,6	**19,4**

6	KR20-LIEN-E-11	28,5	29	30	**29**	14,3	15,2	14,8	**14,8**
7	KR20-LIEN-E-13	38	39	38,5	**39**	15,2	15,3	15,1	**15,2**
8	KR20-LIEN-E-18	30	31,5	30,5	**31**	18,6	19,2	18,9	**18,9**
9	KR20-LIEN-E-25	56	54	55,5	**55**	20,8	21,2	20,6	**20,9**
10	KR20-LIEN-L-01	42	43	43	**43**	12,6	12,8	12,3	**12,6**
11	KR20-LIEN-L-04	53	54	54,5	**54**	13,6	14,2	14,1	**14,0**
12	KR20-LIEN-L-06	29,5	30	29	**30**	15,3	16,2	16,4	**16,0**
13	KR20-LIEN-L-09	35	36,5	35,5	**36**	15,6	16,2	15,8	**15,9**
14	KR20-LIEN-L-10	37	38	38,5	**38**	11,6	12,5	12,4	**12,2**
15	KR20-LIEN-L-14	42,5	44	43,5	**43**	19,6	18,8	19,2	**19,2**
16	KR20-LIEN-L-16	45,5	44	46	**45**	14,3	14,7	14,6	**14,5**
17	KR20-LIEN-L-18	50	52	51,5	**51**	18,9	19,2	18,8	**19,0**
18	KR20-LIEN-L-22	32,5	34	34,5	**34**	15,3	15,1	15,6	**15,3**
19	KR20-LIEN-L-23	47	49	47,5	**48**	18,3	19,2	19,6	**19,0**
20	KR20-LIEN-L-25	53	55	54	**54**	20,8	21,3	21,7	**21,3**
Minimum					**29**				**12,2**
Mean					**42**				**16,6**
Maximum					**55**				**21,3**
LSD					**1,22**				
LSD %					**2,91**				
CV %					**1,8**				

The total number of pods per plant was found to be 86 to 134 on average according to returns (Table 4). It was found that the total number of grains in one plant was from 106 to 162. 3 ridges with higher number of pods and grains per plant compared to the model cultivars were identified.

According to the results of the research carried out in laboratory conditions, the weight of 1000 grains of lentil varieties and ranges was determined to be from 60 to 83 grams. 7 ridges with higher 1000-grain weight compared to standard varieties were identified.

Table 4

Pods per plant, number of grains and weight of 1000 grains of lentil cultivars and ridges in the competitive cultivar trial nursery, Guzor-2022.

№	Name of variety	The number of pods per plant,	The number of	TKW, g

		pcs				grains in one plant, pcs	
		1 grain	2 grain	3 grain	Total		
1	**Darmon (check)**	73	31		104	135	77
2	**Sarbon (check)**	91	30		121	151	72
3	KR20-LIEN-E-07	71	21		92	113	68
4	KR20-LIEN-E-08	72	33		105	138	79
5	KR20-LIEN-E-10	90	26		115	141	83
6	KR20-LIEN-E-11	84	18		103	121	68
7	KR20-LIEN-E-13	62	23	2	86	111	76
8	KR20-LIEN-E-18	104	29		133	162	80
9	KR20-LIEN-E-25	109	25	1	134	159	83
10	KR20-LIEN-L-01	58	33		91	124	70
11	KR20-LIEN-L-04	67	29		96	125	76
12	KR20-LIEN-L-06	78	14		92	106	60
13	KR20-LIEN-L-09	66	30	2	97	129	70
14	KR20-LIEN-L-10	92	20		112	132	75
15	KR20-LIEN-L-14	90	24		114	138	80
16	KR20-LIEN-L-16	87	22		109	132	74
17	KR20-LIEN-L-18	71	19		90	108	61
18	KR20-LIEN-L-22	64	23	2	88	112	75
19	KR20-LIEN-L-23	101	24	3	126	152	83
20	KR20-LIEN-L-25	70	24		94	118	78
Minimum		**58**	**14**	**1**	**86**	**106**	**60**
Mean		**80**	**25**	**2**	**105**	**130**	**74**
Maximum		**109**	**33**	**3**	**134**	**162**	**83**
LSD						**6,39**	**1,78**
LSD %						**5,25**	**2,40**
CV %						**3,2**	**1,5**

In conclusion, it should be noted that from the 20 varieties and rows of lentil studied in the nursery of competitive variety trials in irrigated fields, 2-5 days earlier compared to standard varieties, adapted to mechanization, plant height 43-55 cm, weight of 1000 grains 79-83 g, yield 20.5 6 ridges with high photosynthetic productivity of -24.4 c/ha, protein content of 25.4-26.9% were selected. Early-early, fruitful, adapted to mechanization, high photosynthetic productivity, "Baraka" (KR20-LIEN-E-25) variety, which has higher parameters than standard varieties, was selected in the competitive variety testing nursery, and it was recommended to submit it to the Agricultural Crops Varieties Testing Center.

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