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THE EFFECT OF BIOMETRIC INDICATORS OF MUNG BEAN VARIETIES AND LINES GROWN IN SOUTHERN REGIONS ON YIELD

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Annotatsiya. Ushbu masolada Janubiy mintaqalar iqlim sharoitida yetishtirilgan mosh nav va tizmalarining biometrik ko‘rsatkichlari o‘simlik bo‘yi, dukkak uzunligi, bitta o‘simlikdagi dukkaklar soni kabi ko‘rsatkichlarshsh mahsuldorlik va hosildorlik ko‘rsatkichlariga ta’siri tavsiya etilgan va bayon etilgan.

Kalit so‘zlar: mosh, qaytariq, nav, tizma, o‘simlik bo‘yi, dukkak uzunligi, bitta o‘simlikdagi dukkaklar soni.

Аннотация. В статье проанализировано и описано влияние таких биометрических показателей, как высота растений, длина стручков и количество стручков на растении, на показатели продуктивности и урожайности сортов и линий маша, выращиваемых в климатических условиях Южных регионов.

Ключевые слова: маш, сорт, ряд, скрещивание, высота растений, длина стручка, количество стручков на растении.

Abstract. The article analyzes and describes the influence of such biometric indicators as plant height, pod length and number ofpods per plant on the productivity and yield of mung bean varieties and lines grown in the climatic conditions of the Southern regions.

Keywords: Mung bean, crossing, variety, row, plant height, pod length, number of pods per plant

Introduction. In recent years, the development of heat-resistant mung bean varieties has become one of the main objectives of breeding programs. The duration of the plant’s growing period is determined by the genetic variability of the variety and also depends on the growing conditions.

The duration of the plant’s growing period is considered one of the most important characteristics of a variety. This trait depends on the genetic constitution of
the mung bean plant; at the same time, it is also influenced by the conditions under which it is grown, namely soil-climatic and meteorological conditions, cultivation practices, and sowing time.

According to the research of A.R. Tawaha and colleagues, when analyzing the adaptability of legume crops to agroecological conditions in Europe and the response of species to climate change, it was found that adaptation is primarily based on physiological plasticity, root system structure, and biomass distribution [2].

According to the research results of S. Juman and colleagues, it was determined that when the air temperature reaches 45°C during the flowering stage of mung bean, it has a negative effect on yield quantity [3].

J. Cobb and colleagues, in order to determine the heat tolerance of two mung bean varieties, studied plants under day/night air temperature regimes of 35/25°C, 43/30°C, and 45/32°C. They found that increased air temperature during the growing season had a significant effect on pod formation and yield, particularly during the flowering stage [4].

Aschemann-Witzel and colleagues, in order to determine the yield performance of mung bean varieties and accessions, conducted experiments under six different temperature regimes: 15–22°C, 18–26°C, 22–32°C, 28–38°C, 27–37°C, and 15–22°C. Based on the results of these trials, they emphasized that the most favorable temperature range for mung bean cultivation is 22–32°C [5].

Materials and Methods. The research was conducted in 2025 at the central experimental field of the Southern Agriculture Research Institute.

(Table 1).

Yield Performance of Mung Bean Varieties and Lines (Qarshi, 2025)

Sel.№	Varieties and Lines	Plant Height sm	Pod Length, sm	Number of Pods per Plant	Number of Seeds per Pod	1000-Seed Weight, g	Yield, c/ha	Protein Content, %
1	Qahrabo (st)	52,7	9	49	10	58,3	16	28,1
2	KR21-MUNGPYT-IR-01	45,7	6,7	44	8	68	15,6	26,6
3	KR21-MUNGPYT-IR-02	35,7	7	38	8	55,2	14,9	29,7
4	KR21-MUNGPYT-IR-03	61,3	9	37	10	56,2	8,9	28,7
5	KR21-MUNGPYT-IR-04	58,7	7,7	35	9	45,3	9,7	26,3
6	KR21-MUNGPYT-IR-05	70,3	8,7	46	10	50	16,7	27,3
7	KR21-MUNGPYT-IR-06	48,7	8	41	9	51,3	9,4	31,3
8	KR21-MUNGPYT-IR-07	60,7	7	36	8	47,6	9,8	26,6
9	KR21-MUNGPYT-IR-08	55	6,3	34	9	56,6	8,2	26,5
10	KR21-MUNGPYT-IR-09	65	7	33	8	47,6	6,7	29
11	KR21-MUNGPYT-IR-10	67	8,3	36	9	50,8	6,7	30,2
12	KR21-MUNGPYT-IR-11	44	8	54	10	54,7	17,9	28,9
13	KR21-MUNGPYT-IR-12	34,3	9,7	41	11	58,3	12,4	32,3

14	KR21-MUNGPYT-IR-13	59	9	53	10	59,1	17	30,4
15	KR21-MUNGPYT-IR-14	37,7	8,7	49	10	52,7	18,2	26,1
16	KR21-MUNGPYT-IR-15	59	8,7	50	10	52,4	17,1	32
17	KR21-MUNGPYT-IR-16	64,3	8,3	33	9	51,7	6,6	27,3
18	KR21-MUNGPYT-IR-17	51	7,3	34	8	42	9,4	28,4
19	KR21-MUNGPYT-IR-18	52,7	7,7	39	9	44,4	15	27,3
20	KR21-MUNGPYT-IR-19	70	8,3	36	9	57	18,2	27,7
21	KR21-MUNGPYT-IR-20	57,7	8	52	7	65	18,4	28,9
22	KR21-MUNGPYT-IR-21	58,3	8	58	10	45,5	18,5	28,7
23	KR21-MUNGPYT-IR-22	67,3	9,3	57	10	63,2	17,7	29
24	KR21-MUNGPYT-IR-23	48,3	5,3	35	6	51,6	11,7	27,1
25	KR21-MUNGPYT-IR-24	38,3	8,7	60	11	46,4	17,8	27,7
26	KR21-MUNGPYT-IR-25	62,7	8,7	53	9	50,3	17,5	30,4
27	KR21-MUNGPYT-IR-26	41,7	9	45	10	56,7	15,6	32
28	KR21-MUNGPYT-IR-27	42	8,3	60	9	46,7	18	30,3
29	KR21-MUNGPYT-IR-28	64,3	8,7	54	9	55,4	17,9	30,5
30	KR21-MUNGPYT-IR-29	56,7	9,3	35	10	70,7	13,9	26,5
31	KR21-MUNGPYT-IR-30	67	9,3	33	10	54	11,6	25,5
32	KR21-MUNGPYT-IR-31	57	8,7	55	10	55,3	17,3	27,3
33	KR21-MUNGPYT-IR-32	63	9,3	56	10	52,7	17,8	27,4
34	KR21-MUNGPYT-IR-33	48,3	8	55	10	46,2	18,1	29,4

35	KR21-MUNGPYT-IR-34	63,3	8,7	53	11	51,2	17,6	28,4
36	KR21-MUNGPYT-IR-35	55,7	9	52	9	59,3	18,5	32,1
37	KR21-MUNGPYT-IR-36	72,7	10	47	10	51,4	17,9	27,4
38	KR21-MUNGPYT-IR-37	60,3	8	61	10	58,9	18,5	30,9
39	KR21-MUNGPYT-IR-38	44,7	8,3	50	10	52,4	18,2	27,3
40	KR21-MUNGPYT-IR-39	61,7	10	52	10	52	18,1	29,4
41	KR21-MUNGPYT-IR-40	65,3	7,7	37	8	50,6	12,9	26
42	KR21-MUNGPYT-IR-41	56,3	7,3	34	7	56,2	7,3	31,4
43	KR21-MUNGPYT-IR-42	61	8	48	9	50,7	17,8	29,3
44	KR21-MUNGPYT-IR-43	49,3	5	43	7	45,5	15,8	26,3
45	KR21-MUNGPYT-IR-44	50,7	9,3	37	9	50,7	13,5	25,4
46	KR21-MUNGPYT-IR-45	58,7	9,3	41	11	68,2	13,4	28
47	KR21-MUNGPYT-IR-46	59,3	8,7	59	10	55,3	18,2	27,5
48	KR21-MUNGPYT-IR-47	65	9,3	47	10	52,7	16,9	28
49	KR21-MUNGPYT-IR-48	54,8	9	50	9	61,6	17	29,6
50	KR21-MUNGPYT-IR-49	59,3	9	33	11	42,7	11,1	28,1
	Min	**34,3**	**5**	**33**	**6**	**42**	**6,6**	**25,4**
	Mean	**56,1**	**8,3**	**45**	**9**	**53,5**	**14,8**	**28**
	Max	**72,7**	**10**	**61**	**11**	**70,7**	**18,5**	**32**
	LSD0,05					**2,63**	**0,05**	**0,3**
	LSD0,05%					**4,906**	**0,307**	**0,941**
	CV%					**3**	**0,2**	**0,6**

The experimental design, phenological observations, records, and analyses were carried out in accordance with the methodology of the All-Union Institute of Plant Industry (VIR, 1984).

Biometric analyses were performed based on the guidelines of the State Center for Variety Testing of Agricultural Crops (1985, 1989).

Mathematical and statistical analyses of the experimental results were carried out using the methodology of B.A. Dospekhov (1985). In 2025, the experiment was conducted in the “Central” experimental field of the breeding nursery at the Southern Agriculture Research Institute, located in Qarshi District, Qashqadaryo Region. A total of 50 varieties and lines were sown in three replications on plots of 5 m² each for study.

Results and Discussion. During the study, the influence of biometric traits of 50 mung bean varieties and lines, cultivated in the breeding nursery, on productivity and yield performance was analyzed. According to the analysis, plant height across replications ranged from an average of 34.3 cm to 70.3 cm. The standard variety, “Qaxrabo,” had a plant height of 52.7 cm. Among the lines, 14 had plant heights between 34.3 and 51 cm, which is considered low. Meanwhile, 11 lines exhibited plant heights higher than the standard variety, ranging from 54.8 to 70.3 cm.

In the experiment, the pod length of the varieties and lines ranged from 5 to 10 cm, and the number of seeds per pod varied from 6 to 11. In the standard variety “Qaxrabo,” pod length was 9 cm, and each pod contained 10 seeds. Among the lines, 3 had pod lengths longer than the standard variety, 35 were shorter, and 11 matched the standard variety. Regarding the number of seeds per pod, 5 lines exceeded the standard variety, 24 were lower, and the remaining 20 lines had the same number of seeds per pod as “Qaxrabo.”

When analyzing the number of pods per plant among the varieties and lines, it was found to range from 33 to 61 pods. In the standard variety “Qaxrabo,” each plant had 49 pods. Among the lines, 28 had fewer pods than the standard variety, 20 had more, and 1 line matched the standard variety.

Out of the 50 studied varieties and lines, 5 lines were identified in which the number of pods per plant, 1000-seed weight, and overall yield exceeded those of the standard variety.

When analyzing the 1000-seed weight of mung bean varieties and lines under laboratory conditions, it was found that the standard variety “Qaxrabo” had a 1000-seed weight of 58.3 g and a yield of 16 c/ha.

Conclusion. The lines that outperformed the standard variety were identified as follows:

- KR21-MUNGPYT-IR-13: 1000-seed weight 59.1 g, yield 17 c/ha
- KR21-MUNGPYT-IR-20: 1000-seed weight 65 g, yield 18.4 c/ha
- KR21-MUNGPYT-IR-22: 1000-seed weight 63.2 g, yield 17.7 c/ha
- KR21-MUNGPYT-IR-35: 1000-seed weight 59.3 g, yield 18.5 c/ha
- KR21-MUNGPYT-IR-48: 1000-seed weight 61.6 g, yield 17 c/ha
- KR21-MUNGPYT-IR-37: 1000-seed weight 58.9 g, yield 18.5 c/ha

These lines demonstrated higher 1000-seed weight and yield compared to the standard variety.

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