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ASSESSMENT OF GROWTH AND YIELD PERFORMANCE OF WINGED BEAN (*Psophocarpus tetragonolobus* L.) GENOTYPES UNDER KONKAN AGRO-CLIMATIC CONDITIONS

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ABSTRACT

Evaluation of twenty genotypes of winged bean (*Psophocarpus tetragonolobus* L.) were done for yield parameters under Konkan agro-climatic conditions of Maharashtra. The present investigation was conducted at the Nursery no. 4, under Department of Vegetable Science, Faculty of Horticulture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (MS). The experiment was conducted in Randomized Block Design with two replications and duration spanning from July 2022-23 to 2023-24. The results revealed considerable variability exists among the genotypes of winged bean. Significant differences were also found among the genotypes analysed for twenty quantitative characters. The results of pooled data of the experiment revealed that the mean values for minimum days required to 50% flowering (71.52 days), days to first harvest (94.04 days), highest pod length (22.83 cm), number of pods per vine (83.12), number of seeds per pod (14.61), highest seed yield per vine (183.77 g), 100 seed weight (49.10 g), seed yield per hectare (2.042 kg), respectively. The genotype DPL-WB-13 was found promising for pod yield per plant than other genotypes. These three genotypes i.e. DPL-WB-13, DPL-WB-17 and DPL-WB-18 exhibited better yield attributing characters in comparison to others.

Key words : Winged bean Genotypes, Pod yield and Seed yield.

Introduction

The winged bean (*Psophocarpus tetragonolobus* L.) is a versatile yet underutilized leguminous crop belonging to the Fabaceae family, predominantly cultivated in tropical regions. The plant has a diploid chromosome number $2n = 2x = 18$ or 22 . In India, it is commonly cultivated by local communities in regions including Mizoram, Manipur, Tripura, Kerala, Karnataka, Goa and Maharashtra. Alternatively, it is also termed as God-sent vegetable, Asparagus pea, Four-angled bean, Goa bean and Princess pea (Amoo *et al.*, 2006). It is also referred to as the “SOYBEAN OF TROPICS” and “GREEN

GOLD” (Sarode and Dodake, 2019). Additionally, it has earned nicknames like “supermarket on a stalk” and “one species supermarket” because of its nutritionally rich green pods, tuberous roots, leaves and both immature and mature seeds. It is a self-pollinated, dicotyledonous, climbing, tuberous vegetable crop. Winged bean is increasingly recognized as a crop with significant potential for enhancing nutritional security in the coming decades. Notably, the beans contain essential key minerals like iron, copper, manganese, calcium, phosphorus and magnesium. Moreover, the tender, immature pods are a very low-calorie vegetable, with 100 grams containing

just 49 calories (Singh *et al.*, 2022). Its ease in cultivation, extended growing season, positive nutritional response, high yield and rich genetic diversity make the winged bean highly attractive to vegetable growers. It is also characterized by rapid germination, quick establishment, tolerance to high rainfall and frost, high yield per unit area in short duration and exceptional nutritional value. Its wide variability in morphological characteristics, as well as in flowering and fruiting habit, caters to different consumer preferences based on locality. This existing biodiversity offers significant potential for selecting promising winged bean genotypes that can enhance production and productivity. Under such circumstances, a comparative evaluation is necessary to identify promising winged bean genotypes that are best suited to the Konkan region, thereby enhancing production and productivity. Additionally, a nutritional study will help to determine, if it offers superior nutraceutical value. This study aims to elucidate the existing variability in winged bean, as little work has been done on its genetic improvement. Every part of the winged bean is rich in protein, vitamins, and minerals (Chandel *et al.*, 1978; Mahto and Dua, 2009).

Materials and Methods

The present experiment was conducted at Department of Vegetable Science, College of Horticulture, Dapoli, Dist. Ratnagiri (M.S.), India; during the *Kharif-Rabi* seasons of 2022-23 and 2023-24, respectively. The site was selected based on its suitability for the cultivation of winged bean. The selected soil was well-drained, fertile, with uniform depth and fertility. The soil pH was 5.5 and the electrical conductivity (EC) was below 1 mS cm⁻¹. The field experiment was laid out using a Randomized

Block Design (RBD) with twenty genotypic treatments, each replicated twice. Seeds of each genotype were sown in rows with a spacing of 1.2 m between rows and 75 cm between plants. Several important traits *viz.* days to 50% flowering, days to first harvest, pod length, number of pods per vine, number of seeds per pod, seed yield per vine, 100 seed weight and seed yield per hectare were studied. Data were collected from five competitive plants within each replication of the genotype under study. Analysis of variance was carried out as per the procedure given by Panse and Sukhatme (1995).

Results and Discussion

Days to 50 % flowering

Days to fifty per cent flowering is also considered as one of the most important characters deciding precociousness and synchronizing potential of the genotype. It is usually governed by the genetic makeup of the plant as well as the prevailing environmental conditions under which the crop is being grown. During present investigation the number of days required for flowering of fifty per cent plants in plot after sowing were counted during two successive seasons (i.e., 2022-23 and 2023-24).

The days required for 50% flowering in different genotypes of winged bean under study ranged between 70.03 to 92.54 days with their population mean of 82.33 days. During the year 2022-23, the minimum days required for 50% flowering (70.03 days) was recorded in genotype DPL-WB-4 which was significantly superior over other genotypes whereas, the maximum days required for 50% flowering was seen in genotype DPL-WB- 17 (92.54 days).

During the year 2023-24, the minimum days required

Table 1 : Sources of genotypes.

S. no.	Accession No./ Genotypes	Source	S. no.	Accession No./ Genotypes	Source
1.	DPL- WB -1	Dahod, Gujrat	11.	DPL- WB -11	Wai, Satara
2.	DPL- WB -2	Amarpar, Gujrat	12.	DPL- WB -12	Hiyanglam, Manipur
3.	DPL WB -3	Jamgaon, Chhattisgarh	13.	DPL- WB -13	Rahimatpur, Satara
4.	DPL- WB -4	Ratanpur, Chhattisgarh	14.	DPL- WB -14	Gorivade, Gaganbavda, Kolhapur
5.	DPL- WB -5	Ozarde, Satara	15.	DPL- WB -15	Panhala, Kolhapur
6.	DPL- WB -6	Hivare, Mohol, Solapur	16.	DPL- WB -16	Karad, Satara
7.	DPL- WB -7	Machi, Manipur	17.	DPL- WB -17	Bhatmarali, Satara
8.	DPL- WB -8	Dahiwadi, Satara	18.	DPL- WB -18	Lilong, Manipur
9.	DPL- WB -9	Kurul, Mohol, Solapur	19.	DPL- WB -19	Munambam, Kerala
10.	DPL- WB -10	Pavas, Ratnagiri	20.	DPL- WB -20(Revathi)- Check	Kerala Agriculture University, Kerala

for 50% flowering (73.02 days) was recorded in genotype DPL-WB-4, which was significantly superior over other genotypes whereas, the maximum days required for 50% flowering was observed in genotype DPL-WB-17 (93.67 days).

The perusal of data revealed that the difference in various genotypes with respect to days to 50% flowering was significant. The minimum days required for 50% flowering (71.52 days) was recorded in genotype DPL-WB-4, which was significantly superior over other genotypes whereas, the maximum days required for 50% flowering was registered in genotype DPL-WB- 17 (93.10 days). These longer flowering times indicate a delayed reproductive phase, which may be beneficial in regions where extended growing seasons are common or in environments that require more time for crop development to reach optimal yield. These results confirmed with findings reported by Mohamadali *et al.* (2005), Prasanth *et al.* (2015), Kant and Nandan (2018), Raiger and Jajoriya (2019), Sarode and Dodake (2019), Kumbhar (2021), Bhadmus *et al.* (2023), Hansda *et al.* (2023), Patel *et al.* (2023) and Thapa *et al.* 2024) in winged bean.

Days to first harvest

Days to first harvesting is an important yield attributing character which enable the early harvest of the crop. This character is usually governed by genotypic constituent of the variety but can be altered to some extent due to the environmental conditions in which the crop is being grown. During present investigation, days to first harvesting were counted from the date of sowing till the first harvest of tender, immature pod for year 2023-23 and 2023-24.

During the year 2022-23 the minimum days required for first harvest (92.71 days) was recorded in genotype DPL-WB-4 followed by DPL-WB-7, DPL-WB-8, DPL-WB-9 and DPL-WB-11 whereas, the maximum days required to first harvest was found in genotype DPL-WB- 17 (116.37 days). During the year 2023-24 the minimum days required for first harvest (95.41 days) was recorded in genotype DPL-WB-4, which was significantly superior over other genotypes whereas, the maximum days required for first harvest was registered in genotype DPL-WB- 17 (115.73 days). The pooled data revealed that the difference in various genotypes with respect to days to first harvest was significant. The minimum days required for first harvest (94.04 days) was recorded in genotype DPL-WB-4 which was significantly superior over other genotypes whereas, the maximum days required for first harvest was observed in genotype DPL-WB- 17 (116.05 days). Genetically early genotypes in

beans are having poor yielding ability of green/immature pods. Similar results were observed by Prasanth *et al.* (2015), Kumbhar (2021) and Thapa *et al.* (2024).

Pod length (cm)

Pod length is considered as important parameter deciding quality and marketability of the winged bean. Pod having more pod length are preferred for vegetable purpose. Pod length was measured during both the season (2022-23 and 2023-24) during present investigation (Table 2).

During the year 2022-23, the highest pod length (23.08 cm) was registered in genotype DPL-WB-17, which was at par with genotype DPL-WB-2 (22.81 cm), DPL-WB-8 (21.5 cm), DPL-WB- 11 (22.00 cm), DPL-WB-13 (22.71 cm), DPL-WB- 15 (22.70 cm) and DPL-WB-16 (22.10 cm) whereas, the lowest pod length was registered in genotype DPL-WB-1(15.80 cm). During the year 2023-24, the highest pod length (22.91 cm) was registered in genotype DPL-WB-17, which was at par with genotype DPL-WB-8 (22.55 cm), DPL-WB-13 (22.73 cm), DPL-WB-15 (22.80 cm), DPL-WB-16 (22.10 cm) and DPL-WB-20 (22.55 cm). Whereas, the lowest pod length was recorded in genotype DPL-WB-1(15.25 cm). The pooled data regarding pod length are presented in Table 2. The data revealed significant difference in various genotypes with respect to pod length. The highest pod length (22.83 cm) was found in genotype DPL-WB-17 which was at par with genotype DPL-WB-2 (22.24 cm), DPL-WB-8 (21.5 cm), DPL-WB- 11 (22.05 cm), DPL-WB- 13 (22.81 cm), DPL-WB- 15 (22.75 cm) DPL-WB-16 (22.10 cm) and DPL-WB-20 (21.98 cm) whereas, the lowest pod length was registered in genotype DPL-WB-1 (15.53 cm). It might be due to the fact that, genetic nature, environmental factor as well as it would depend on growth, reproductive phases and protein synthesis in the climber crop like winged bean and thus enhancing pod length. Similar results were observed by Mohammadali *et al.* 2005), Prasanth *et al.* (2015), Kant and Nandan (2018), Sarode and Dodake (2019), Kumbhar 2021), Isthifaiyyah *et al.* (2021), Hansda *et al* 2023), Patel *et al.* 2023) and Thapa *et al.* 2024 in winged bean.

Number of pods per plant

Winged bean has capacity to produce continuous flowers once enter in reproductive phase. The pods are produced in a quick succession until completion of the life cycle of the plant. The number of pods produced on a single plant is an important factor deciding production potential of the plant. The number of pods harvested from each observational plant was recorded during two successive years (2022-23 and 2023-24) as well as in

pooled during investigation. The data regarding same are presented in Table 3.

During the year 2022-23, the highest number of pods (83.02) was observed in genotype DPL-WB-13 which was at par with genotype DPL-WB-17 (79.70) and DPL-WB-18 (76.26) whereas, the lowest number of pods was registered in genotype DPL-WB-2 (41.04). During the year 2023-24, the highest number of pods (83.21) was seen in genotype DPL-WB-13 which was at par with genotype DPL-WB-17 (79.82) and DPL-WB-18 (79.62) whereas, the lowest number of pods was recorded in genotype DPL-WB-2 (50.69). The pooled data revealed that the difference in various genotypes with respect to number of pods was significant. The highest number of pods (83.12) was recorded in genotype DPL-WB-13 which was at par with genotype DPL-WB-17 (79.03) and DPL-WB-18 (77.94) whereas, the lowest number of pods was found in genotype DPL-WB-2 (45.87). The number of pods per plant is dependent on number of flowers produced per plant and per cent fruit set which in turn are dependent on the genetic makeup as well as the crop management practices. The number of pods in present investigation manifested huge variation indicating the ample scope for selection of elite genotypes for this character. Similar results were reported by Prasanth *et al.* (2015), Sarode and Dodake (2019) Kumbhar (2021), Isthifaiyyah *et al.* (2021), Bhadmus *et al.* (2023), Hansda *et al.* (2023), Patel *et al.* (2023) and Thapa *et al.* (2024) in winged bean.

Number of seeds per pod

The data presented in Table 3 revealed that there was significant difference among the different genotypes for number of seeds per pod during both the year (i.e., 2022-23 and 2023-24) as well as in pooled data.

During the year 2022-23, the highest number of seeds per pod (14.40) was recorded in genotype DPL-WB-9 which was at par with genotype DPL-WB-2 (12.90) and DPL-WB-7 (13.00) whereas, the lowest number of seeds per pod was observed in genotype DPL-WB-4 (10.00). During the year 2023-24 the highest number of seeds per pod (14.81) was recorded in genotype DPL-WB-9 which was significantly superior over other genotypes in present investigation whereas, the lowest number of seeds per pod was found in genotype DPL-WB-4 (9.69). The data revealed that the difference in various genotypes with respect to number of seeds per pod was significant. Pooled data showed that, the highest number of seeds per pod (14.61) was recorded in genotype DPL-WB-9 which was significantly superior over other genotypes in present investigation whereas, the lowest number of seeds

per pod as registered in genotype DPL-WB-4 (9.85). Similar results were observed by Kant and Nandan (2018), Sarode and Dodake (2019), Kumbhar (2021), Soni *et al.* (2022), Bhadmus *et al.* (2023), Hansda *et al.* (2023), Patel *et al.* (2023) and Thapa *et al.* (2024) in winged bean.

Seed yield per vine (g)

The yield per unit area is significantly influenced by the yield per plant. It is the important character in breeder's perspective when applying selection criteria in crop improvement. Yield is a very complex character and a variety of other characters contribute to its expression.

During the year 2022-23, the seed yield per vine ranged from 56.83 to 187.79 g with a general mean of 135.28 g. The highest seed yield per vine (187.79 g) was recorded in genotype DPL-WB-17, which was at par with genotype DPL-WB-1 (168.99 g), DPL-WB-9 (175.08 g) and DPL-WB-16 (169.65 g) whereas, the lowest seed yield per vine was observed in genotype DPL-WB-4 (56.83 g). During 2023-24, the seed yield per vine was in the range of 66.84 to 179.75 g with mean 140.62 g. The highest seed yield per vine (179.75 g) was found in genotype DPL-WB-17 which was at par with genotype DPL-WB-9 (176.85 g), DPL-WB-13 (175.15 g) and DPL-WB-16 (178.11 g) whereas, the lowest seed yield per vine was recorded in genotype DPL-WB-4 (66.84 g).

The pooled data revealed the difference in various genotypes with respect to seed yield per vine was significant. The seed yield per vine was in the range of 61.84 to 183.77 g with mean 137.95 g. From the data, the highest seed yield per vine (183.77 g) was recorded in genotype DPL-WB-17 which was at par with genotype DPL-WB-9 (175.97 g) and DPL-WB-16 (173.88 g) whereas, the lowest seed yield per vine was registered in genotype DPL-WB-4 (61.84 g). This variation might be a result of the genotypes varying genetic make-up and their capacity to adapt to environments outside of their immediate environment. The similar variation pattern in winged bean genotype for seed yield per plant was also noticed by Kant and Nandan (2018), Sarode and Dodake (2019), Kumbhar (2021), Soni *et al.* (2022), Bhadmus *et al.* (2023), Hansda *et al.* (2023) and Thapa *et al.* (2024) in winged bean.

100 seed weight (g)

The seeds of each genotype were extracted from physiologically mature fruits after sufficient drying. The weight of 100 seeds was measured on electronic balance during two successive years (2022-23 and 2023-24) as

Table 2 : Yield and yield attributing traits in various winged bean genotypes.

Genotypes	Days to 50% flowering			Days to first harvest			Pod length (cm)			Number of pods		
	2022-23	2023-24	Pooled	2022-23	2023-24	Pooled	2022-23	2023-24	Pooled	2022-23	2023-24	Pooled
DPL -WB -1	87.57	89.22	88.39	104.62	108.98	106.80	15.80	15.25	15.53	79.70	74.90	77.30
DPL -WB -2	82.95	84.92	83.93	107.46	111.12	109.29	22.81	21.66	22.24	41.04	50.69	45.87
DPL -WB -3	80.06	78.00	79.03	104.50	103.19	103.85	18.65	18.61	18.63	57.43	63.64	60.54
DPL -WB -4	70.03	73.02	71.52	92.71	95.39	94.05	18.31	18.42	18.37	55.91	59.63	57.77
DPL -WB -5	77.08	78.10	77.59	101.67	104.26	102.96	19.15	18.65	18.90	65.03	61.70	63.37
DPL -WB -6	81.27	83.05	82.16	100.95	102.55	101.75	20.12	20.07	20.10	62.52	63.03	62.78
DPL -WB -7	81.96	85.99	83.98	98.41	99.22	98.81	20.79	20.89	20.84	72.36	72.32	72.34
DPL -WB -8	81.94	84.94	83.44	99.61	102.56	101.09	21.55	22.55	22.05	66.66	62.82	64.74
DPL -WB -9	80.25	83.84	82.04	99.08	103.60	101.34	17.46	17.76	17.61	67.44	71.13	69.29
DPL -WB -10	85.17	86.77	85.97	102.86	104.06	103.21	17.88	18.00	17.94	73.29	74.84	74.07
DPL -WB -11	77.75	79.95	78.85	99.06	102.80	100.93	22.00	21.70	21.85	62.37	66.46	64.42
DPL -WB -12	82.02	85.17	83.59	103.60	107.23	105.42	20.20	20.30	20.25	61.16	68.83	65.00
DPL -WB -13	82.65	86.94	84.79	105.95	108.49	107.22	22.71	22.73	22.81	83.02	83.21	83.12
DPL -WB -14	79.42	77.29	78.35	105.28	103.12	104.40	20.73	20.78	20.76	70.91	76.89	73.90
DPL -WB -15	87.19	86.37	86.78	109.57	107.47	108.52	22.70	22.80	22.75	75.19	68.10	71.65
DPL -WB -16	88.02	87.44	87.73	112.25	113.08	112.67	22.10	22.10	22.10	71.91	73.78	72.85
DPL -WB -17	92.54	93.67	93.10	116.37	115.73	116.05	23.08	22.91	22.83	78.23	79.82	79.03
DPL -WB -18	82.08	84.21	83.14	104.69	107.49	106.09	20.93	21.93	21.43	76.26	79.62	77.94
DPL -WB -19	81.82	83.90	82.86	102.83	104.94	103.63	21.17	21.62	21.40	62.56	64.68	63.62
DPL-WB-20 (Revathi)- Check	84.91	83.36	84.13	101.13	99.95	100.54	21.23	22.55	21.98	69.41	70.79	70.10
Range	70.03- 92.54	73.02- 93.67	71.52- 93.10	92.71- 116.37	95.39- 115.73	94.05- 116.05	15.80- 23.08	15.25- 22.91	15.53- 22.83	41.04- 83.02	50.69- 83.21	45.87- 83.12
Mean	82.33	83.81	83.07	103.60	105.26	104.43	20.47	20.57	20.52	67.62	69.34	68.48
Result	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG
S.Em±	0.78	1.05	0.98	1.04	1.15	1.09	0.62	0.20	0.30	2.37	1.95	2.10
CD@5%	2.24	3.03	2.82	3.01	3.33	3.14	1.78	0.59	0.86	6.84	5.64	6.08

well as in pooled during investigation. The data regarding same are presented in Table 3.

During the year 2022-23, the greatest 100 seed weight (49.35 g) was recorded in genotype DPL-WB-14 which was at par with genotypes DPL-WB-6, DPL-WB-12, DPL-WB-15, DPL-WB-16, DPL-WB-17 and DPL-WB-18 whereas, the lowest 100 seed weight was observed in genotype DPL-WB-7 (31.10 g). During the year 2023-24, the highest 100 seed weight (48.85 g) was observed in genotype DPL-WB-14, which was at par with genotypes DPL-WB-16 whereas, the lowest 100 seed weight was recorded in genotype DPL-WB-2 (30.39 g).

The perusal of data revealed that the difference in various genotypes with respect to 100 seed weight was significant. The greatest 100 seed weight (49.10 g) was recorded in genotype DPL-WB-14 which was at par with genotypes DPL-WB-16 whereas, the lowest 100 seed weight was registered in genotype DPL-WB-2 (30.82 g). 100 seed weight decides the weight of individual seed which might be contributing to the seed germination and vigour of the plant which ultimately decides the further growth and development. Similar results were observed by Raiger and Jajoriya (2019), Sarode and Dodake (2019), Kumbhar (2021,) Soni *et al.* (2022), Bhadmus *et al.*

Table 3 : Seed yield attributing traits in various winged bean genotypes.

Genotypes	Number of seeds per pod			Seed yield per vine (g)			100 seed weight (g)			Seed yield / ha (kg)		
	2022-23	2023-24	Pooled	2022-23	2023-24	Pooled	2022-23	2023-24	Pooled	2022-23	2023-24	Pooled
DPL -WB -1	12.60	13.60	13.10	168.99	167.50	168.25	34.40	35.24	34.82	1.878	1.861	1.869
DPL -WB -2	12.90	12.85	12.88	122.79	120.54	121.66	31.25	30.39	30.82	1.364	1.339	1.352
DPL- WB -3	12.00	12.40	12.20	125.50	126.07	125.79	34.20	34.70	34.45	1.394	1.401	1.398
DPL- WB -4	10.00	9.69	9.85	56.83	66.84	61.84	34.00	34.12	34.06	0.631	0.743	0.687
DPL -WB -5	11.85	12.26	12.06	92.94	100.67	96.80	40.30	41.80	41.05	1.033	1.119	1.076
DPL -WB -6	12.60	11.60	12.10	82.60	109.20	95.90	41.65	42.19	41.92	0.918	1.213	1.066
DPL -WB -7	13.00	12.83	12.91	135.29	129.00	132.14	31.10	31.92	31.51	1.503	1.433	1.468
DPL -WB -8	12.50	13.09	12.80	163.61	158.99	161.30	39.20	40.17	39.69	1.818	1.767	1.792
DPL -WB -9	14.40	14.81	14.61	175.08	176.85	175.97	32.55	32.60	32.57	1.945	1.965	1.955
DPL -WB -10	12.60	12.25	12.43	149.75	144.70	147.23	38.70	39.24	38.97	1.664	1.608	1.636
DPL -WB -11	11.75	11.76	11.76	91.46	110.21	100.83	38.40	38.59	38.49	1.016	1.225	1.120
DPL -WB -12	10.70	10.55	10.62	142.02	143.32	142.67	43.10	44.24	43.67	1.578	1.592	1.585
DPL -WB -13	12.10	12.38	12.24	162.57	175.15	168.86	39.55	40.55	40.05	1.806	1.946	1.876
DPL -WB -14	10.10	11.39	10.75	148.77	154.75	151.76	49.35	48.85	49.10	1.653	1.719	1.686
DPL -WB -15	11.90	11.78	11.84	154.44	163.44	158.94	42.75	42.25	42.50	1.716	1.816	1.766
DPL -WB -16	10.70	11.16	10.93	169.65	178.11	173.88	48.40	47.79	48.09	1.885	1.979	1.932
DPL -WB -17	12.80	13.12	12.96	187.79	179.75	183.77	46.35	44.44	45.39	2.087	1.997	2.042
DPL -WB -18	12.55	12.36	12.46	123.07	136.99	130.03	41.40	42.90	42.15	1.554	1.528	1.541
DPL -WB -19	12.00	12.35	12.18	112.54	132.79	122.66	38.25	39.75	39.00	1.250	1.475	1.363
DPL-WB-20 (Revathi)- Check	12.70	12.62	12.66	139.85	137.49	138.67	32.80	33.80	33.30	1.367	1.522	1.445
Range	10.00- 14.40	9.69- 14.81	9.85- 14.61	56.83- 187.79	66.84- 179.75	61.84- 183.77	31.10- 49.35	30.39- 48.85	30.82- 49.10	0.631- 2.087	0.743- 1.997	0.687- 2.042
Mean	12.09	12.24	12.16	135.28	140.62	137.95	38.89	39.27	39.08	1.503	1.562	1.532
Result	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG	SIG
S.Em±	0.54	0.32	0.25	7.82	3.08	4.82	2.95	1.06	0.45	0.09	0.03	0.05
CD@5%	1.57	0.93	0.73	22.60	8.90	13.94	8.53	3.06	1.30	0.25	0.10	0.15

(2023), Hansda *et al.* (2023), Patel *et al.* (2023) and Thapa *et al.* (2024) in winged bean.

Seed yield per hectare (kg)

The critical observation of the data presented in Table 3 revealed that there was significant difference among the different winged bean genotypes under study during both the year (i.e., 2022-23 and 2023-24) as well as in pooled data.

During the year 2022-23, the seed yield per hectare was in the range of 0.631 to 2.087 kg with mean 1.503 kg. The highest seed yield per hectare (2.087 kg) was

recorded in genotype DPL-WB-17, which was at par with genotype DPL-WB-1 (1.878 kg), DPL-WB-9 (1.945 kg) and DPL-WB-16 (1.885 kg) whereas, the lowest seed yield per hectare was registered in genotype DPL-WB-4 (0.631 kg). During the year 2023-24, the seed yield per hectare was in the range of 0.743 to 1.997 kg with mean 1.562 kg. The highest seed yield per hectare (1.997 kg) was recorded in genotype DPL-WB-17, which was at par with genotype DPL-WB-9 (1.965 kg) and DPL-WB-13 (1.946 kg) and DPL-WB-16 (1.979 kg) whereas, the lowest seed yield per hectare was seen in genotype DPL-WB-4 (0.743 kg). The pooled data regarding seed

yield per hectare are presented in Table 3. The perusal of data revealed that the difference in various genotypes with respect to seed yield per hectare was significant. The seed yield per hectare was in the range of 0.687 to 2.042 kg with mean 1.532 kg. From the data, it is concluded that, the highest seed yield per hectare (2.042 kg) was found in genotype DPL-WB-17 which was at par with genotype DPL-WB-9 (1.955 kg) and DPL-WB-16 (1.932 kg) whereas, the lowest seed yield per hectare was recorded in genotype DPL-WB-4 (0.687 kg). This variation might be a result of the genotypes varying genetic make-up and their capacity to adapt to environments outside of their immediate environment. The similar variation pattern in winged bean genotype for seed yield per hectare was also reported by Sarode and Dodake (2019).

Conclusion

From the investigation, it can be concluded that, the genotype DPL-WB-4 recorded earlier days to 50 % flowering (71.52 days) and days to first harvest (94.05 days) compare to rest of the genotypes whereas, genotype DPL-WB- 17 recorded highest pod length (22.83 cm), highest seed yield per vine (183.77 g) and seed yield per hectare (2.042 kg).

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