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Mean performance of onion (*Allium cepa* L.) genotypes for growth, yield and quality parameter

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Abstract
The present study was conducted at the Department of Vegetable Sciences, K.R.C. College of Horticulture, Arabhavi, during *rabi* 2024-25 to evaluate fifty-four onion (*Allium cepa* L.) genotypes for growth, yield and quality traits in a randomized block design with two replications. Significant genetic variability was observed for all traits. NHRDF Red-4 recorded the tallest plants, Bhima Red had the highest number of leaves and Bhima Shakti showed the greatest plant weight and yield (26.64 t/ha). Balichakra Local exhibited maximum dry matter (16.53%), Bailhongal Local had the highest TSS (16.01 °Brix) and DOGR-1772 showed maximum pyruvic acid (5.90 µmoles/g). Overall, Bhima Shakti, NHRDF Red-4, Bailhongal Local, DOGR-1772 and Balichakra Local were identified as superior genotypes for use in future breeding programs.

Keywords: Onion, replication, growth, yield and quality

Introduction
Onion (*Allium cepa* L.) is a significant bulb crop from the Alliaceae family, extensively cultivated and consumed worldwide in many forms. The bulb, which grows underground, the edible portion and can be harvested at either immature or mature stages, serving as a vegetable or condiment. Cultivated onions are herbaceous annuals when grown for bulbs and biennials for seed production. Their distinctive flavor arises from sulfur-containing compounds, mainly allyl propyl disulphide, which impart a characteristic pungency and aroma. In India, red onions with strong pungency are preferred, while milder yellow and white varieties are favored in Europe and Japan. Apart from culinary uses, onions possess medicinal qualities and are integral to various traditional medicine systems including Homeopathy, Unani and Ayurveda. Onion bulbs and leaves are a good source of minerals such as calcium, phosphorus and potassium. Developing improved onion varieties with consistent performance remains a challenge for breeders, partly due to the crop's sensitivity to light and temperature during bulb formation and the variability seen under different climate conditions. Onion cultivars differ widely in bulb size, skin color, pungency and maturation times. Generally, larger bulbs are sweeter and less pungent compared to smaller ones. Red-colored onions tend to be more pungent and have superior storage capabilities, whereas yellow types garner less market demand. Various varieties and genotypes exist, each differing in shape, size and color and export preferences are influenced by consumer demand for specific bulb characteristics.

Materials and Methods
The present investigation was conducted at Department of Vegetable Sciences, Kittur Rani Channamma College of Horticulture, Arabhavi during *rabi* season 2024-25. 'Fifty-four genotypes were collected from different various institution and different areas and evaluated by using randomized block design consisting two replications. Five plants were selected randomly from each replication and data were recorded for the characters *viz.*, plant height (cm), number of leaves per plant, leaf length (cm), neck diameter (cm), fresh weight of plant (g), dry weight of plant (g), dry matter content of plant (%), polar diameter of bulb (cm), equatorial diameter of bulb (cm), bulb shape index, average bulb weight (g), total yield (kg/plot), total yield (t/ha),

harvest index (%), number of rings per bulb, TSS (° Brix), pyruvic acid (µmoles/g) were calculated. Dry matter content was calculated by as formula given below

$$\text{Per cent dry matter} = \frac{\text{Dry weight of plant (g)}}{\text{Fresh weight of plant (g)}} \times 100$$

Harvest index

$$\text{Harvest index (\%)} = \frac{\text{Bulb weight (g)}}{\text{Weight of whole plant (g)}} \times 100$$

Bulb shape index

$$\text{Bulb shape index} = \frac{\text{Polar diameter of bulb (cm)}}{\text{Equatorial diameter of bulb (cm)}} \times 100$$

Quality parameters

TSS (° Brix)

The total soluble solids (TSS) content of the pulp was determined using a hand refractometer and expressed in degrees Brix (°Brix).

Pyruvic acid (µmoles/g)

Pungency of onion was estimated as per procedure given by Anthon and Barrett (2003). For 1 ml of onion juice sample, 1.5 ml of 5% trichloroacetic acid and 18 ml of distilled water was added. Prepared mixture of 1 ml was taken into test tube and then 1 ml each of 2, 4-di-nitriphenyl hydrazine and distilled water was added and sample was incubated at 37º C for 10 minutes. Later, 5 ml of 0.6 N of NaOH was added into the sample and absorbance was measured in spectrophotometer at 420 nm using blank (without sample) and its content was expressed in micro moles per gram.

Results and Discussion

Mean performance is a vital parameter for finding and discarding undesirable types during selection process. Findings of the present study indicated significant variability among onion genotypes for growth, yield and quality traits. The analysis of variance showed genotypic differences were significant for all traits evaluated, demonstrating substantial variation among the tested genotypes.

Plant height (cm)

The highest plant height was observed in NHRDF Red-4 (64.85 cm) and significant differences were observed among other genotypes. Whereas, minimum plant height was observed in W-203-GP (43.67 cm). Similar findings for plant height were noticed by Umamaheswarappa *et al*. (2015) [24] Singh *et al*. (2020) [18] and Ajjappalavara *et al*. (2022) [1].

Number of leaves

Number of leaves per plant was found highest for Bhima Red (12.83) and varied differences were observed among genotypes. While, minimum number of leaves noted for W-364-GP. Such variations for number of leaves per plant was also observed by Ratan *et al*. (2017) [15], Pandey *et al*. (2020) [12], Meghana (2021) [11] and Jana *et al*. (2023) [8] in onion.

Leaf length (cm)

Variations in leaf length was observed among the genotypes. NHRDF Red-4 was recorded maximum leaf length and lowest leaf length was observed in genotype W-203-GP. These results were in accordance with the findings of Manjunathagowda *et al*. (2019) [10], Amarananjundeswara *et al*. (2020) [2] and Rani *et al*. (2024) [14].

Neck diameter (cm)

Neck diameter was recorded minimum in Bangalore Rose onion (0.78 cm) and maximum neck diameter was recorded in DOGR-1774. Significant variations were observed among the genotypes. These results are comparable to the findings of Sarkar *et al*. (2015) [17], Meghana *et al*. (2021) [11] and Yadav *et al*. (2024) [25].

Fresh weight of plant (g)

Significant differences in fresh plant weight at harvest were observed among the genotypes. The fresh weight ranged from 69.47 to 108.90 g per plant, with an average of 90.30 g per plant. The genotype Bhima Shakti recorded the highest fresh weight (108.90 g/plant). In contrast, the lowest fresh weight (69.47 g/plant) was noted in Gadag Local. These results were also supported by the outcomes of Rayar (2014) [16], Ratan *et al*. (2017) [15], Edith *et al*. (2018) [4] and Jana *et al*. (2023) [8].

Dry weight of plant (g)

A significant variation in plant dry weight was observed among the genotypes, ranging from 9.28 to 14.32 g per plant, with an overall mean of 11.90 g per plant. The highest dry weight (14.32 g/plant) was recorded in the genotype Bhima Shubra and lowest was recorded in the genotype Bhima Raj. These results were also supported by the outcomes of Rayar (2014) [16], Ratan *et al*. (2017) [15], Edith *et al*. (2018) [4] and Jana *et al*. (2023) [8].

Dry matter content of plant (%)

The percentage of dry matter content in plants exhibited significant variation across the genotypes studied. Values ranged from 8.98 to 16.53 per cent, with an overall mean of 13.31 per cent. The highest dry matter content was observed in the genotype Balichakra Local (16.53%). In conversely, lowest dry matter percentage (8.98%) was recorded in Bhima Raj. These results were also supported by the outcomes of Rayar (2014) [16], Ratan *et al*. (2017) [15], Edith *et al*. (2018) [4] and Jana *et al*. (2023) [8].

Polar diameter of bulb (cm)

Significant differences were observed among the genotypes for polar diameter of the bulb. The average polar diameter ranged from 3.84 to 6.11 cm, with a mean value of 5.38 cm. The genotype Arka Bheem recorded the highest polar diameter (6.11 cm), whereas, lowest polar diameter was recorded in the genotype W-364-GP. A related finding regarding bulb diameter variation was also observed by Lakshmipathi (2016) [9], and Yadav *et al*. (2024) [25].

Equatorial diameter of bulb (cm)

The equatorial diameter of bulb was ranged from 4.57 to 7.58 cm with a general mean of 6.18 cm. the highest equatorial diameter was observed in Bhima Kiran, whereas, lowest was observed in Gadag Local. A related finding regarding bulb diameter variation was also observed by Tripathy *et al*. (2016) [22] and Priyadarshani (2018) [13].

Bulb shape index

Bulb shape index showed statistically significant differences across the genotypes, with values ranging between 0.77 and 1.06 with an average of 0.88. The genotype Arka Bheem exhibited

the highest bulb shape index (1.06) and lowest bulb shape index was recorded in W-344 (0.77). Similar finding regarding bulb diameter variation was also observed by Lakshmipathi (2016) [9], Tripathy *et al*. (2016) [22], Priyadarshani (2018) [13] and Yadav *et al*. (2024) [25].

Table 1: Mean performance of onion genotypes for growth, yield and quality parameters

Treatment/ genotypes	Plant height (cm)	No. of leaves	Leaf length (cm)	Neck diameter (cm)	Days to maturity	Fresh weight of plant (g)	Dry weight of plant (g)	Dry matter content (%)	Polar diameter of bulb (cm)	Equatorial diameter of bulb (cm)	Bulb shape index	Average diameter of bulb (g)	Number of rings per bulb	Total yield (t/ha)	TSS (°Brix)	Pyruvic acid (µmoles/g)
Agri Found Dark Red	47.18	10.62	44.81	0.87	110	86.26	12.81	14.92	5.68	6.60	0.87	66.44	7.60	18.15	12.73	3.45
Agri Found Light Red	55.24	11.54	51.86	1.16	114	98.13	13.97	14.22	5.65	6.65	0.85	74.01	7.90	21.81	12.01	4.98
Akola Safed	58.90	11.30	53.84	1.47	100	91.16	12.68	13.90	5.60	6.50	0.86	65.01	7.25	21.48	11.45	3.95
Arka Bheem	51.23	9.70	48.39	0.81	113	87.95	14.25	16.20	6.11	5.76	1.06	59.29	6.60	19.08	15.02	4.84
Arka Kalyan	59.78	11.65	54.25	1.20	111	88.86	13.26	15.06	5.31	6.34	0.84	66.01	7.30	21.58	14.57	5.15
Athani Local	52.80	11.20	52.36	1.25	95	80.02	11.78	14.71	5.19	5.72	0.91	63.50	7.55	19.61	12.55	4.78
Bailhongal Local	54.11	11.20	50.87	0.83	109	84.51	11.94	14.18	5.50	5.68	0.97	62.50	7.50	20.31	16.01	4.02
Balichakra Local	49.16	10.55	46.39	0.98	106	85.14	14.08	16.53	5.41	6.55	0.83	58.49	7.05	18.58	15.85	4.91
Ballary Red	48.86	10.41	46.26	1.13	114	73.67	10.79	14.70	5.29	5.65	0.94	58.67	7.45	19.25	13.07	5.13
Bangalore Rose Onion	57.01	10.56	54.31	0.78	95	79.61	10.75	13.51	4.55	4.99	0.91	64.44	6.60	18.08	14.74	5.07
Bhima Dark Red	53.57	10.86	54.40	1.20	114	103.31	11.81	11.42	5.60	7.00	0.80	76.15	8.10	23.41	11.54	4.49
Bhima Kiran	54.06	10.59	51.81	0.88	116	95.95	14.00	14.61	5.55	7.18	0.78	75.75	8.00	23.31	12.80	4.76
Bhima Light Red	55.26	10.80	51.68	1.01	114	101.86	11.96	11.74	5.56	6.82	0.82	67.86	7.35	21.28	11.45	4.71
Bhima Raj	56.68	11.48	53.02	1.00	115	103.32	9.28	8.98	5.98	6.95	0.86	74.50	7.90	22.74	11.02	4.86
Bhima Red	63.11	12.83	58.16	0.89	109	102.50	12.70	12.42	6.08	6.75	0.90	65.99	7.00	21.78	12.89	4.60
Bhima Safed	62.02	11.84	56.50	0.93	105	101.98	10.91	10.69	5.75	6.45	0.89	76.15	7.45	21.15	12.98	3.72
Bhima Shakti	62.81	11.55	58.31	1.24	112	108.90	10.24	9.40	6.01	6.49	0.92	79.45	8.60	26.64	14.33	4.87
Bhima Shubra	57.36	11.60	54.36	1.19	98	97.61	14.32	14.72	5.59	6.54	0.86	69.65	7.40	20.61	13.04	4.10
Bhima Shweta	58.31	11.23	55.38	1.10	109	94.06	13.74	14.60	5.61	6.72	0.84	63.45	8.00	20.28	12.36	3.55
Bhima Super	59.86	11.61	56.00	1.18	114	95.01	12.40	13.10	6.06	6.59	0.92	75.86	8.40	22.21	12.85	4.41
Bhoomi Red	55.74	12.02	51.31	1.06	97	84.66	12.81	15.13	5.61	6.43	0.88	55.50	7.30	17.15	10.93	4.71
DOGR-1768	52.47	10.80	49.67	1.12	107	101.38	13.35	13.22	5.70	6.51	0.88	61.80	7.80	21.41	12.12	4.75
DOGR-1770	53.98	10.75	49.26	1.04	106	92.82	14.10	15.19	5.48	6.60	0.84	60.44	7.85	21.98	14.35	4.99
DOGR-1771	54.28	9.80	49.82	1.30	111	107.52	12.86	12.22	4.37	5.35	0.82	67.39	7.20	20.61	12.85	4.53
DOGR-1772	53.80	9.60	50.69	0.85	98	101.61	13.09	12.87	5.71	6.45	0.89	67.01	7.25	21.71	13.05	5.90
DOGR-1773	63.48	12.07	57.41	1.18	104	105.52	11.12	10.34	5.60	6.84	0.82	78.50	8.30	25.77	11.85	4.60
DOGR-1774	55.92	10.75	53.27	1.73	110	96.56	13.14	13.64	5.44	6.19	0.88	68.36	7.40	21.74	12.36	4.72
Gadag Local	45.93	12.27	42.25	1.09	95	69.47	10.11	14.57	4.48	4.57	0.98	49.45	6.58	14.99	13.89	4.82
Gavran Fursungi	53.84	11.41	50.01	1.02	103	75.68	10.88	14.42	5.52	6.45	0.86	54.03	7.40	16.72	13.05	4.74
GJRO-11	54.96	12.75	51.29	1.31	110	88.44	11.68	13.23	5.00	6.40	0.78	63.05	7.90	19.58	12.80	4.24
GJWO-3	53.25	11.65	50.04	0.95	97	81.97	9.80	11.95	5.54	6.50	0.86	61.36	7.40	18.98	12.24	4.31
GWO-1	52.22	11.78	49.58	1.21	104	84.47	9.50	11.25	5.17	6.38	0.81	60.60	7.08	19.41	11.58	4.05
Mole Local	55.77	10.36	51.17	0.92	101	72.88	10.36	14.24	4.40	4.85	0.90	53.45	7.20	14.99	13.12	4.98
NHRDF L-28	57.32	10.48	53.37	1.23	114	99.62	14.15	14.20	5.57	6.53	0.85	64.41	7.40	19.08	12.93	4.89
NHRDF Red	56.41	11.14	53.58	1.31	118	90.55	12.91	14.31	6.02	6.75	0.89	71.05	7.50	21.84	13.13	5.55
NHRDF Red-2	55.12	10.75	53.01	1.10	112	104.91	11.05	9.49	5.61	6.67	0.84	69.38	7.50	23.18	11.25	5.10
NHRDF Red-3	61.35	11.50	56.37	1.18	114	98.51	12.84	13.24	5.67	6.50	0.87	72.86	7.45	21.68	14.25	5.10
NHRDF Red-4	64.85	12.28	60.55	1.18	115	94.54	10.94	11.57	5.94	6.35	0.94	77.51	8.50	24.24	12.36	5.42
Nippani Local-1	51.27	10.50	47.27	0.92	116	77.00	12.27	15.93	5.17	5.71	0.91	59.45	7.65	18.71	13.77	4.99
Nippani Local-2	52.71	10.78	48.51	0.91	117	80.48	10.38	12.88	5.09	5.99	0.85	51.13	7.15	18.28	11.25	5.22
Panchaganga Export Special	57.60	12.03	53.16	0.92	102	76.59	11.41	14.94	5.62	6.42	0.88	63.58	7.70	17.72	13.99	4.84
Panchaganga Safed no 16	54.85	11.97	51.12	0.91	105	72.16	10.37	14.37	5.25	6.26	0.84	56.12	6.70	14.42	12.25	3.71
Panchaganga	52.65	11.50	48.26	1.05	96	78.35	10.75	13.77	5.54	6.23	0.89	56.09	7.65	15.65	13.25	4.62

Special																
Puna Fursungi	48.98	9.90	47.86	1.19	108	100.47	10.86	10.81	5.52	5.46	1.01	64.99	7.40	18.22	11.22	5.31
RO- 59	58.37	10.91	55.10	1.39	106	79.01	10.83	13.77	4.80	5.11	0.94	65.00	7.03	15.02	12.25	4.56
Sankaratti Local	46.52	10.23	45.11	0.98	104	69.80	10.10	14.46	5.19	5.46	0.95	45.62	6.63	14.85	13.54	4.76
Telagi Local	50.61	10.25	47.33	1.03	100	96.81	10.70	11.07	5.67	6.18	0.92	59.98	7.00	21.51	13.03	4.66
W-203-GP	43.67	9.50	40.36	0.92	104	82.85	12.34	14.89	5.61	6.52	0.86	57.76	7.20	18.71	14.13	3.76
W-344	52.28	9.05	49.75	0.94	95	80.53	11.75	14.58	4.95	6.41	0.77	57.74	7.80	20.31	15.10	3.45
W-355	60.20	10.30	56.57	1.23	105	97.92	11.86	12.12	4.91	5.63	0.88	60.31	7.50	16.78	12.54	3.26
W-361	54.07	9.90	51.68	1.11	112	92.02	10.32	11.21	4.40	5.55	0.79	44.85	6.88	12.09	11.88	3.60
W-364-GP	52.70	9.00	50.18	1.08	98	97.25	11.76	12.08	3.84	4.61	0.84	64.64	7.10	20.38	13.12	4.42
W-408	59.11	11.90	56.95	0.98	110	101.60	13.91	13.70	5.47	6.54	0.84	60.99	7.38	15.35	13.55	4.10
W-504	44.23	9.00	41.55	1.05	95	82.73	11.13	13.50	4.49	5.30	0.85	54.86	7.30	14.52	14.58	4.03
Mean	54.77	10.96	51.41	1.08	106.70	90.30	11.90	13.31	5.38	6.18	0.88	63.75	7.45	19.60	12.98	4.57
S.Em. ±	2.36	0.54	2.32	0.10	0.94	3.47	0.54	1.20	0.31	0.33	0.07	3.08	0.26	1.09	0.50	0.22
CD @ 5%	6.70	1.52	6.58	0.28	7.98	9.86	1.52	2.41	0.87	0.88	0.19	8.73	0.75	3.10	1.43	0.63
CV	6.09	6.90	6.38	12.86	6.50	7.68	8.26	9.04	8.04	7.13	11.00	9.57	6.47	9.87	5.32	6.86

Average weight of bulb (g)

Significant differences in average bulb weight were observed among the genotypes. The values ranged from 44.85 to 79.45 g, with an overall mean of 63.75 g. Bhima Shakti exhibited the heaviest bulbs (79.45 g) followed by DOGR-1773(78.50 g) and NHRDF Red-4 (77.51 g), whereas, lowest weight of bulb was observed in the genotype W-361 (44.85 g). These results were aligned with the findings of Trivedi and Dhumal (2010) [23] and Hulagannavar *et al*. (2023) [7] in onion.

Number of rings per bulb

Number of rings per bulb differed significantly among the genotypes with values ranging from 6.58 to 8.60, with an average of 7.45. The genotype Bhima Shakti (8.60) recorded the highest number of rings closely followed by NHRDF Red-4 (8.50), Bhima Super (8.40), DOGR-1773 (8.30) and Bhima Dark Red (8.10), which were statistically similar. On the other hand, the lowest ring count (6.58) was found in the genotype Gadag Local. These results were comparable to the findings of Devi *et al.* (2014), Sarkar *et al*. (2015) [17], Meghana *et al*. (2021) [11] and Yadav *et al.* (2024) [25].

Days to maturity

Among the genotypes evaluated for days to maturity of onion. Athani Local, Bangalore Rose onion, Gadag Local, W-344 and W-504 genotypes took minimum days to maturity (95 days each). While, the genotype NHRDF Red took maximum days to maturity (118 days). These results were also supported by the outcomes of Rayar (2014) [16], Ratan *et al*. (2017) [15], Edith *et al*. (2018) [4] and Jana *et al*. (2023) [8].

Harvest index (%)

The harvest index showed significant differences across the genotypes, with values ranging from 48.74 to 83.01 per cent with a mean of 70.86 per cent. Panchaganga Export Special recorded the highest harvest index (83.01%), which was statistically comparable to RO-59 (82.27%), NHRDF Red-4 (81.99%) and Bangalore Rose onion (80.94%). In contrast, the lowest harvest index was noted in W-361(48.74%). These results were also in conformity with the findings of Priyadarshini (2018), Bobade (2020) [3], Solanki *et al.* (2020) [19] and Manjunath (2022) [10].

Total yield per hectare (t/ha)

The genotypes exhibited significant variation in total bulb yield per hectare. The yield ranged from 12.09 to 26.64 t/ha, with a mean of 19.60 t/ha. Bhima Shakti recorded the highest yield (26.64 t/ha) followed by DOGR-1773 (25.77 t/ha), NHRDF Red-4 (24.24 t/ha) and Bhima Dark Red (23.41 t/ha). On the other end, the lowest yield was noted in W-361 (12.09 t/ha). Similar yield variations were also reported by Umamaheswarappa *et al.* (2015) [24], Suhas (2016) [20], Ganiger *et al*. (2018) [5], Solanki *et al*. (2020) [19], Manjunath (2022) [10] and Tiwari *et al.* (2022) [21].

Total Soluble Solids (° Brix)

Total soluble solids (TSS) content in onion bulbs varied significantly among the genotypes, with values ranging from 10.93 to 16.01 °Brix with an average of 12.98 °Brix. The highest TSS was observed in Bailhongal Local (16.01 °Brix) followed closely by Balichakra Local (15.85 °Brix), W-344 (15.10 °Brix) and Arka Bheem (15.02 °Brix). In contrast, the lowest TSS content was recorded in genotype Bhoomi Red (10.93 °Brix). These outcomes of results were also in consistent with the works of Hosamani *et al*. (2010), [6] Sarkar *et al*. (2015) [17], Lakshmipathi *et al*. (2017) [9], Singh *et al.* (2020) [18], Jana *et al*. (2023) [8] and Yadav *et al*. (2024) [25].

Pyruvic Acid content (µmoles/g)

Significant differences were observed among the genotypes for pyruvic acid content in onion bulbs, with values ranging from 3.26 to 5.90 µmoles/g and an overall mean of 4.57 µmoles/g (Table 7). The highest pyruvic acid content was recorded in the genotype DOGR-1772 (5.90 µmoles/g) followed by NHRDF Red (5.55 µmoles/g), NHRDF Red-4 (5.42 µmoles/g), Puna Fursungi (5.31 µmoles/g) and Arka Kalyan (5.15 µmoles/g). In contrast, the lowest value was noted in W-355 (3.26 µmoles/g). These outcomes of results were aligned with the works of Hosamani *et al*. (2010) [6], Lakshmipathi *et al*. (2017) [9], Jana *et al*. (2023) [8] and Yadav *et al*. (2024) [25].

Among the fifty-four onion genotypes evaluated, Bhima Shakti, NHRDF Red-4, Bailhongal Local, DOGR-1772 and Balichakra Local emerged as top performers. Bhima Shakti excelled in bulb weight, number of rings and total yield with superior storage performance. NHRDF Red-4 recorded the tallest plants and longest leaves, indicating strong vegetative growth. Bailhongal Local showed the highest total soluble solids, while DOGR-1772 had the greatest pyruvic acid content. Balichakra Local performed well for dry matter content, reflecting good bulb quality and density.

References

1. Ajjappalavara PS, Shivakumar G, Ravikumar B, Vinaykumar MM, Shantappa T, Jayanthi BV, *et al.*

Assessment of new different colored onion F1 hybrids for yield and quality parameters. J Farm Sci. 2022;35(2):255-258.
2. Amarananjundeswara H, Priyadarshini G, Doddabasappa B, Vasudeva KR, Anjanappa M, Prasad PS, *et al*. Evaluation of white onion (*Allium cepa* L.) genotypes for growth, yield and yield attributing characters. J Pharmacogn Phytochem. 2020;9(5):477-480.
3. Bobade SV. Studies on morphological and physio-chemical properties of Alibag white onion [PhD thesis]. Dapoli (India): Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth; 2020.
4. Edith DMJ, Dimitry MY, Richard NM, Armand AB, Leopold TN, Nicolas NY. Effect of drying treatment on nutritional, functional and sensory properties of three varieties of onion powders. J Food Meas Charact. 2018;12(4):2905-2915.
5. Ganiger VM, Shruti PG, Goudappanavar B, Bhuvaneshwari G. Performance study of onion (*Allium cepa* L.) varieties for quantitative traits in Northern dry zone of Karnataka. Int J Chem Stud. 2018;6(2):2620-2622.
6. Hosamani RM, Patil BC, Ajjappalavara PS. Genetic variability and character association studies in onion (*Allium cepa* L.). Karnataka J Agric Sci. 2010;23(2):302-305.
7. Hulagannavar P, Patil B, Gunnaiah R, Cholin S. Estimates of variability, heritability and genetic advance for yield and its quality traits in onion (*Allium cepa* L.) genotypes. Int J Environ Clim Change. 2023;13(10):1758-1770.
8. Jana K, Thapa U, Kundu S, Hansda NN, Ray K, Tamang D. Evaluation of different genotypes of late kharif onion (*Allium cepa* L.) under the Gangetic plains of West Bengal, India. Int J Plant Soil Sci. 2023;35(22):295-305.
9. Lakshmipathi N. Studies on collection and evaluation of onion landraces (*Allium cepa* L.). Bagalkot (India): Univ. Hort. Sci.; 2016.
10. Manjunath U. Evaluation of rabi onion (*Allium cepa* L.) genotypes in Northern Karnataka. Dharwad (India): Univ. Agric. Sci.; 2022.
11. Meghana. Assessment of onion (*Allium cepa* L.) varieties for growth and yield attributes under Central dry zone of Karnataka. Pharma Innov J. 2021;10(12):1712-1715.
12. Pandey NK, Chauhan AK, Sharma B. Evaluation of onion (*Allium cepa* L.) varieties for its suitability in Bundelkhand region. J Krishi Vigyan. 2020;9(1):73-76.
13. Priyadarshani. Evaluation of white onion (*Allium cepa* L.) genotypes for bulb yield, quality and processing [MSc thesis]. Bagalkot (India): Univ. Hort. Sci.; 2018.
14. Rani KS, Shree S, Singh VK, Kumar A, Rajak J. Studies on genetic variability and heritability in bulb onion (*Allium cepa* L.) in the South-Eastern plains of Bihar, India. Eco Env Cons. 2024;30:109-113.
15. Ratan DR, Gowda RV, Pandey H. Evaluation of different onion genotypes for yield and quality parameters in kharif season under Bengaluru condition, India. Int J Curr Microbiol Appl Sci. 2017;6(11):2393-2398.
16. Rayar SM. Effect of pre-treatments and varieties on dehydration of red onion. Bagalkot (India): Univ. Hort. Sci.; 2014.
17. Sarkar RK, Kharga BD, Pandit TK, Thapa AD, Moktan MW. Evaluation of onion (*Allium cepa* L.) varieties for growth, yield and quality traits under hill agro-climatic conditions of West Bengal. Environ Ecol. 2015;33(2):956-959.
18. Singh RK, Singh SK, Tailor AK. The performance studies on storage of white onion for good keeping quality onion varieties under ordinary condition: keeping quality of white onion. J Agri Search. 2020;7(2):86-92.
19. Solanki B, Maity TK, Maji A. Evaluation of onion genotypes for growth, yield and quality traits under Gangetic-alluvial plains of West Bengal. Int J Chem Stud. 2020;8(4):2157-2162.
20. Suhas YH. Studies on performance of varieties, F1 hybrids and synthetics of onion in Eastern dry zone of Karnataka. Bagalkot (India): Univ. Hort. Sci.; 2016.
21. Tiwari JK, Kumar A, Singh S. Evaluation of different rabi onion varieties under Bihar conditions: performance of rabi onion varieties. J Agri Search. 2022;9(3):222-225.
22. Tripathy P, Sahoo BB, Patel D, Dash DK. Efficacy of sulphur on growth, yield and bulb quality in onion (*Allium cepa* L.). J Spices Aromat Crops. 2016;4(1):60-64.
23. Trivedi AP, Dhumal KN. Variability and correlation studies on bulb yield, morphological and storage characters in onion (*Allium cepa* L.). J Pure Appl Sci. 2010;18(1):1-4.
24. Umamaheswarappa P, Chandrappa D, Chandravamshi P. Performance of onion (*Allium cepa* L.) varieties for growth and yield parameters under Central dry zone of Karnataka. J Pharmacogn Phytochem. 2015;5(3):344-346.
25. Yadav A, Singh RK, Luthra S, Kumar RCP, Kumar V, Rajbhar R, *et al*. Evaluation of onion (*Allium cepa* L.) genotypes for yield and its attributes traits under Bundelkhand region of Uttar Pradesh, India. J Adv Biol Biotechnol. 2024;27(5):32-40.