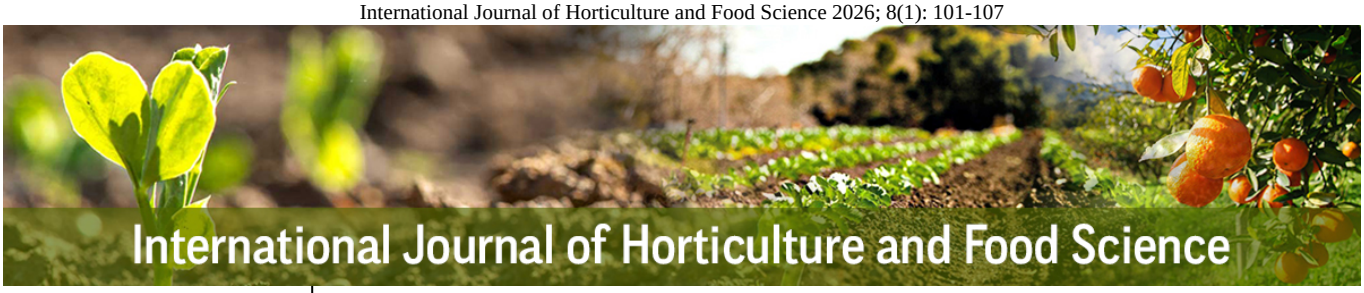

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Studies on performance of Onion (*Allium cepa* L.) Genotypes for Growth, Yield, Quality and Pest Incidence during Rabi 2024-25

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Abstract
Onion (*Allium cepa* L.) is a vital vegetable crop in India, with significant economic importance. This study evaluated 50 onion genotypes for growth, yield, bulb quality and pest incidence during the *rabi* season of 2024-25 at Dharwad, Karnataka. Analysis of variance (ANOVA) revealed significant genotypic differences for all traits. High-performing genotypes including NHRDF Red-2 (50.89 t/ha bulb yield), NHRDF Red-4 (47.72 t/ha) and Bhima Raj (46.42 t/ha). Genotypes like Telagi-L exhibited thin neck thickness (0.52 cm), while DOGR-1771 showed high dry matter content (18.42 g). Low pest incidence was observed in NHRDF Red-4 (0% purple blotch) and Arakera local (0.51 thrips/plant). These findings identify superior genotypes for cultivation and hybridization in similar agro-climatic zones.

Keywords: Onion genotypes, Rabi, Biotic stresses, Dharwad and Yield attributes

Introduction
Onion (*Allium cepa* L.), a biennial herb in the *Alliaceae* family with 2n = 16 chromosomes, originates from Central Asia and ranks fourth among global vegetables (Best, 2000; McCollum, 1976). Known as Pyaz in Hindi and Ullagaddi in Kannada, it is used in salads, cooking, and dehydration. Its nutritional profile includes 86.6 g moisture, 1.2 g protein, and vitamins like C (119 g) per 100 g edible portion. Medicinal benefits include anti-carcinogenic and anti-thrombotic effects from flavonoids and sulfur compounds. In India, onion covers 1.537 million ha, producing 24.212 million tonnes at 16.10 t/ha, with Karnataka contributing 0.255 million ha and 2.049 million tonnes at 14.17 t/ha (Anonymous, 2024). Export earnings reach ₹3,513.22 crore from 2.60 million tonnes. Productivity lags behind the USA (55.95 t/ha) due to limited hybrids. Onion requires 12-13 hour day lengths for Rabi varieties and temperatures of 15.5-25 °C for bulbing (Thamburaj and Singh, 2019) [14]. Genotypic performance varies by region, necessitating evaluations for stability (Malik *et al*., 2024; Gupta *et al*., 2024) [10, 8]. Genetic research is limited by the crop's biology (Chattoo and Angrej, 2015) [5]. This study assesses 50 genotypes for performance in Rabi 2024-25 at Dharwad.

Materials and Methods
The trial was at Main Agricultural Research Station, Dharwad (Zone VIII, red sandy loam soil). Meteorological data for 2024-25 showed average max/min temperatures of 31.17°C/18.89°C and rainfall 976.10 mm (Appendix II). Fifty genotypes from sources like IIHR, DOGR, NHRDF (Table 1) were used. Seeds sown in October 2024, seedlings transplanted in November to raised beds (1.2 m × 1.0 m) with 15 cm × 10 cm spacing, randomized complete block design, two replications. FYM (25 t/ha) and NPK (125:50:125 kg/ha) applied, with drip irrigation and pest control. Traits like plant height, leaves per plant, leaf area, LAI, maturity days, bolting (%), bulb diameters, shape index, neck thickness, rings per bulb, dry matter, TSS, bulb weight, yield per plot, yield per ha, purple blotch (%), thrips (no./plant). ANOVA as per Fisher and Yates (1963) data analyzed for means, S.Em ±, CD (5%).

Results and Discussion
ANOVA at Dharwad for Rabi 2024-25 showed significant genotypic differences (*) for all

traits (Table 2). High genotypic mean squares for leaf area (4753.66), bulb polar diameter (44.48), and yield per ha (34.87) indicate substantial variation. Genotypes varied widely in growth traits (Table 2). Bhima Raj recorded the highest plant height (54.75 cm), while Bhima Light Red had the lowest (38.00 cm). Arka Kalyan and Bhima Safed had the maximum leaves/plant (10.50 and 10.00). DOGR-1769 and N-53 showed the largest leaf area (498.21 cm² and 497.42 cm²) and LAI (3.32). Days to maturity ranged from 87.50 (DOGR-1774) to 100.00 (Balichakra-W, Bhima Kiran, AFLR). Bolting was lowest (0%) in several genotypes like NHRDF Red and GJWO-3. These variations reflect photo-thermo sensitivity (Thamburaj and Singh, 2019) [14]. High leaf area genotypes like DOGR-1769 align with findings of Verma *et al*. (2022) [15], indicating better photosynthetic efficiency. Bulb traits showed significant diversity (Table 3). Telagi-W had the largest polar diameter (52.86 cm), while Bhima Shweta the smallest (34.96 cm). W-504 exhibited the widest equatorial diameter (63.27 cm). Shape index was highest in Balichakra-R and AFDR (1.04). Telagi-L had the thinnest neck (0.52 cm), ideal for storage. W-448 had the most rings/bulb (11.00). DOGR-1771 showed high dry matter (18.42 g), and GJWO-3 the highest TSS (15.59 °Brix). Thin neck and high TSS enhance storage life (Gupta *et al*., 2024) [8]. High dry matter in DOGR-1771 supports dehydration suitability (Saha *et al*., 2024) [13]. Yield varied from 30.94 t/ha (W-405) to 50.89 t/ha (NHRDF Red-2) (Table 4). High yielders included NHRDF Red-4 (47.72 t/ha), Bhima Raj (46.42 t/ha), and Balichakra-R (44.94 t/ha). Bulb weight was highest in DOGR-1760 (88.45 g). Superior yield in NHRDF lines corroborates Choudhary *et al*. (2022) and Dikshit *et al*. (2020) [6, 7], attributed to better bulb size and low bolting. Purple blotch incidence was lowest (0%) in NHRDF Red-4 and NHRDF Red-2, while thrips was minimal in Arakera local (0.51/plant) and W-355 (0.91/plant) (Table 5). High incidence occurred in DOGR-1768 (10.93 thrips) and W-125-GP (12.29 thrips). Low incidence genotypes like NHRDF Red-4 offer resistance potential (Chauhan *et al*., 2023; Karavina and Murembwa, 2025) [4, 9].

Table 1: Genotypes used for the experiment with their source of collection

Sl. No.	Genotypes	Source of Collection	Bulb Colour
1	Arka Bheem	IIHR, Bangalore	Red
2	Balichakra-W	Yadgir, (KA)	Light red
3	Bagdal Local	Bidar, (KA)	Light red
4	Arka Kalyan	IIHR, Bangalore	Red
5	Balichakra-R	Yadgir, (KA)	Light red
6	NHRDF Red	NHRDF, Nashik(MH)	Dark red
7	Telagi -L	Vijayapur (KA)	Light red
8	Telagi -W	Vijayapur (KA)	White
9	Bellary Red	Bellary (KA)	Red
10	GWO-1	AAU,Gujurat	White
11	GJRO-11	AAU,Gujurat	Red
12	GJWO-3	AAU,Gujurat	White
13	Bhima Red	ICAR-DOGR, Rajgurunagar (MH)	Red
14	DOGR-1770	ICAR-DOGR, Rajgurunagar (MH)	Red
15	DOGR-1760	ICAR-DOGR, Rajgurunagar (MH)	Light red
16	DOGR-1761	ICAR-DOGR, Rajgurunagar (MH)	Dark red
17	DOGR-1771	ICAR-DOGR, Rajgurunagar (MH)	Dark red
18	DOGR-1773	ICAR-DOGR, Rajgurunagar (MH)	Light red
19	DOGR-1774	ICAR-DOGR, Rajgurunagar (MH)	Red
20	Bhima Super	ICAR-DOGR, Rajgurunagar (MH)	Light red
21	Bhima Raj	ICAR-DOGR, Rajgurunagar (MH)	Dark red
22	Bhima Shakti	ICAR-DOGR, Rajgurunagar (MH)	Light red
23	Bhima Light Red	ICAR-DOGR, Rajgurunagar (MH)	Light red
24	DOGR-1772	ICAR-DOGR, Rajgurunagar (MH)	Dark red
25	DOGR-1769	ICAR-DOGR, Rajgurunagar (MH)	Light red
26	DOGR-1768	ICAR-DOGR, Rajgurunagar (MH)	Dark red
27	Bhima Dark Red	ICAR-DOGR, Rajgurunagar (MH)	Dark red
28	Bhima Kiran	ICAR-DOGR, Rajgurunagar (MH)	Light red
29	W-364 GP	ICAR-DOGR, Rajgurunagar (MH)	White
30	BhimaShweta	ICAR-DOGR, Rajgurunagar (MH)	White
31	W-405	ICAR-DOGR, Rajgurunagar (MH)	White
32	Bhima Shubra	ICAR-DOGR, Rajgurunagar (MH)	White
33	Bhima Safed	ICAR-DOGR, Rajgurunagar (MH)	White
34	W-310-GP	ICAR-DOGR, Rajgurunagar (MH)	White
35	W-344	ICAR-DOGR, Rajgurunagar (MH)	White
36	W-355	ICAR-DOGR, Rajgurunagar (MH)	White
37	W-361	ICAR-DOGR, Rajgurunagar (MH)	White
38	W-504	ICAR-DOGR, Rajgurunagar (MH)	White
39	W-448	ICAR-DOGR, Rajgurunagar (MH)	White
40	W-125-GP	ICAR-DOGR, Rajgurunagar (MH)	White
41	W-210-GP	ICAR-DOGR, Rajgurunagar (MH)	White
42	W-203-GP	ICAR-DOGR, Rajgurunagar (MH)	White
43	W-408	ICAR-DOGR, Rajgurunagar (MH)	White
44	NHRDF Furasangi	NHRDF, Nashik(MH)	Light red
45	AFLR	NHRDF, Nashik(MH)	Light red
46	NHRDF Red-4	NHRDF, Nashik(MH)	Light red
47	NHRDF Red-2	NHRDF, Nashik(MH)	Light red
48	AFDR	NHRDF, Nashik(MH)	Dark red
49	Arakera local	Raichur (KA)	Light red
50	N-53	Dept. of Agriculture (MH)	Light red

Table 2: Analysis of variance for yield and yield attributing traits of onion genotypes at Dharwad during *rabi*-2024-25

Sl. No.	Source of variation/ parameters	Means			S.Em±	CD (5%)
		Replication	Genotypes	Error		
	Degrees of freedom	1	49	49		
1.	Plant height (cm)	44.72	33.87*	20.70	3.22	9.14
2.	Number of leaves per plant	0.16	1.00*	0.61	0.55	1.57
3.	Leaf area (cm^2)	68.70	4753.66*	2183.34	33.04	93.90
4.	Leaf area index	0.00	0.21*	0.10	0.22	0.63
5.	Days to maturity(days)	42.25	18.58*	10.62	2.30	6.55
6.	Pre-mature bolting (%)	0.09	2.43*	0.07	0.19	0.53
7.	Bulb polar diameter (cm)	18.39	44.48*	26.84	3.66	10.41
8.	Bulb equatorial diameter (cm)	47.18	25.65*	15.30	2.77	7.86
9.	Bulb shape index	0.02	0.02*	0.01	0.07	0.20
10.	Bulb neck thickness (cm)	0.02	0.03*	0.02	0.09	0.26
11.	Number of rings per bulb	0.49	1.39*	0.71	0.60	1.70
12.	Bulb dry matter content (g)	4.17	3.00*	1.83	0.96	2.72
13.	Total soluble solid (^{0}B)	0.71	3.13*	1.72	0.93	2.64
14.	Average weight of bulb (g)	18.14	106.49*	61.52	5.55	15.76
15.	Bulb yield per plot (kg)	0.00	0.35*	0.16	0.28	0.80
16.	Bulb yield per hectare (t)	0.42	34.87*	15.65	2.80	7.95
17.	Purple blotch incidence	0.01	2.05*	0.52	0.51	1.45
18	Thrips incidence	0.06	15.44*	0.39	0.44	1.25

* Significant at 5 % level of significance

Table 3: Mean performance onion genotypes for the growth parameters during *rabi*-2024-25 at Dharwad

Sl. No.	Genotypes	Plant Height (cm)	No. of Leaves/Plant	Leaf Area (cm)	Leaf Area Index	Days to maturity	Bolting (%)
1	Arka Bheem	49.62	9.00	406.08	2.71	97.50	3.50
2	Balichakra-W	52.40	8.00	455.77	3.04	100.00	1.00
3	Bagdal Local	51.90	8.50	446.76	2.98	92.50	2.00
4	Arka Kalyan	41.45	10.50	459.56	3.06	90.00	4.50
5	Balichakra-R	42.90	9.00	465.29	3.10	95.00	1.00
6	NHRDF Red	46.90	8.00	331.34	2.21	97.50	0.00
7	Telagi -L	44.10	8.00	496.67	3.31	95.00	1.00
8	Telagi -W	39.15	8.00	441.29	2.94	95.00	1.00
9	Bellary Red	51.10	8.50	471.46	3.14	95.00	1.00
10	GWO-1	48.90	9.00	392.48	2.62	97.50	0.00
11	GJRO-11	50.45	9.00	375.79	2.51	97.50	1.00
12	GJWO-3	51.40	7.50	443.00	2.95	90.00	0.00
13	Bhima Red	43.55	8.50	387.98	2.59	92.50	2.50
14	DOGR-1770	51.25	8.00	380.44	2.54	92.50	1.50
15	DOGR-1760	49.30	9.00	357.46	2.38	90.00	4.00
16	DOGR-1761	52.90	8.00	375.81	2.51	92.50	0.00
17	DOGR-1771	49.95	8.00	354.32	2.36	95.00	1.00
18	DOGR-1773	52.70	7.00	421.59	2.81	92.50	0.50
19	DOGR-1774	44.65	9.00	385.26	2.57	87.50	2.50
20	Bhima Super	48.50	7.50	438.25	2.92	90.00	2.00
21	Bhima Raj	54.75	8.00	468.20	3.12	92.50	2.50
22	Bhima Shakti	49.55	9.00	473.53	3.16	92.50	0.00
23	Bhima Light Red	38.00	9.00	458.43	3.06	97.50	0.00
24	DOGR-1772	42.80	8.00	470.96	3.14	95.00	0.00
25	DOGR-1769	48.15	9.00	498.21	3.32	97.50	0.00
26	DOGR-1768	47.60	8.00	428.72	2.86	92.50	2.00
27	Bhima Dark Red	46.90	9.00	382.77	2.55	90.00	1.00
28	Bhima Kiran	53.05	8.00	483.18	3.22	100.00	0.00
29	W-364 GP	43.60	8.00	430.35	2.87	95.00	1.00
30	Bhima Shweta	50.25	9.00	411.18	2.74	92.50	0.00
31	W-405	42.60	8.00	387.62	2.58	97.50	1.00
32	Bhima Shubra	47.25	8.00	390.94	2.61	92.50	1.00
33	Bhima Safed	53.35	10.00	390.42	2.60	97.50	2.00
34	W-310-GP	49.20	8.00	393.45	2.62	92.50	0.00
35	W-344	43.15	8.00	388.29	2.59	97.50	0.00
36	W-355	52.75	8.00	346.58	2.31	97.50	0.00
37	W-361	45.30	7.00	383.98	2.56	95.00	0.00
38	W-504	46.95	8.00	352.85	2.35	97.50	0.00
39	W-448	47.15	8.00	518.22	3.45	97.50	1.00
40	W-125-GP	44.40	8.00	441.66	2.94	97.50	0.00
41	W-210-GP	44.05	9.00	404.49	2.70	97.50	0.00
42	W-203-GP	49.35	9.00	411.15	2.74	97.50	0.00

43	W-408	43.80	7.50	328.07	2.19	92.50	1.00
44	NHRDF Furasangi	47.40	7.50	434.37	2.90	97.50	1.00
45	AFLR	45.80	7.00	484.74	3.23	100.00	1.00
46	NHRDF Red-4	48.90	8.00	329.26	2.20	92.50	1.00
47	NHRDF Red-2	48.40	9.00	400.87	2.67	95.00	2.00
48	AFDR	39.60	8.00	421.93	2.81	92.50	1.00
49	Arakera local	39.95	8.00	461.52	3.08	97.50	2.00
50	N-53	46.00	8.00	497.42	3.32	97.50	2.00
	S.Em±	3.22	0.55	33.04	0.22	2.30	0.19
	CD (5%)	9.14	1.57	93.90	0.63	6.55	0.53
	CV	9.63	9.40	11.15	11.15	3.44	25.12

Table 4: Mean performance onion genotypes for the bulb parameters during rabi-2023-24 and 2024-25 at dharwad

Sl. No.	Genotypes	Bulb polar diameter	Bulb equatorial diameter	Bulb shape index	Bulb neck thickness	Bulb dry matter	TSS	Rings per bulb
1	Arka Bheem	42.64	49.15	0.87	0.93	13.39	13.75	8.50
2	Balichakra-W	39.94	48.04	0.83	1.04	15.83	15.34	7.50
3	Bagdal Local	44.94	53.02	0.85	0.82	15.37	13.34	8.50
4	Arka Kalyan	50.32	52.46	0.96	0.77	18.18	13.76	9.50
5	Balichakra-R	50.36	49.02	1.04	0.77	16.46	12.39	8.50
6	NHRDF Red	45.87	49.62	0.93	0.76	16.73	15.43	9.50
7	Telagi -L	49.86	50.57	0.98	0.52	15.49	12.81	7.50
8	Telagi -W	52.86	53.72	0.98	0.87	14.77	12.07	9.50
9	Bellary Red	44.41	46.27	0.95	0.79	15.47	13.13	8.50
10	GWO-1	40.09	52.52	0.76	0.73	16.19	12.97	9.50
11	GJRO-11	43.36	52.88	0.82	0.83	15.83	14.85	7.50
12	GJWO-3	44.96	54.14	0.83	0.94	15.37	15.59	10.00
13	Bhima Red	37.62	54.63	0.68	0.91	14.72	11.87	7.50
14	DOGR-1770	44.78	55.15	0.81	0.69	14.13	10.29	8.50
15	DOGR-1760	44.64	56.05	0.80	0.90	12.73	11.19	7.50
16	DOGR-1761	49.66	54.16	0.92	0.93	16.14	10.97	8.50
17	DOGR-1771	47.35	57.38	0.83	0.75	18.42	13.60	7.50
18	DOGR-1773	50.76	55.20	0.92	1.00	13.41	12.76	8.50
19	DOGR-1774	42.43	50.25	0.85	0.83	14.47	12.24	8.50
20	Bhima Super	48.13	53.88	0.89	0.98	14.11	13.54	7.50
21	Bhima Raj	51.28	54.01	0.95	1.07	15.28	10.87	7.50
22	Bhima Shakti	50.08	54.18	0.92	1.00	17.19	13.26	7.50
23	Bhima Light Red	49.55	52.85	0.94	0.88	14.74	12.65	9.50
24	DOGR-1772	50.63	55.81	0.91	0.95	13.46	13.76	7.50
25	DOGR-1769	49.09	50.17	0.99	0.91	15.33	11.13	9.50
26	DOGR-1768	42.82	45.74	0.94	0.81	14.61	11.03	10.00
27	Bhima Dark Red	37.43	50.32	0.75	0.83	15.97	12.98	9.50
28	Bhima Kiran	42.45	48.66	0.88	0.93	14.82	12.03	7.50
29	W-364 GP	37.17	55.36	0.67	0.90	14.78	12.39	9.50
30	Bhima Shweta	34.96	50.42	0.71	0.84	14.20	14.39	10.00
31	W-405	38.49	47.13	0.82	0.93	15.86	11.65	9.50
32	Bhima Shubra	44.14	46.01	0.96	0.71	15.17	14.31	9.50
33	Bhima Safed	37.54	47.04	0.81	0.84	15.14	13.76	7.50
34	W-310-GP	39.56	55.39	0.71	1.02	16.59	12.29	8.50
35	W-344	43.31	53.42	0.81	0.76	15.35	11.79	9.50
36	W-355	41.62	54.13	0.77	1.15	16.27	12.34	9.50
37	W-361	41.48	58.35	0.71	1.07	15.36	14.07	9.50
38	W-504	46.17	63.27	0.73	1.08	14.76	14.33	9.50
39	W-448	47.93	56.36	0.85	0.84	16.28	12.76	11.00
40	W-125-GP	42.84	57.51	0.75	0.75	15.46	13.65	7.00
41	W-210-GP	45.27	56.67	0.80	0.86	15.67	13.54	9.50
42	W-203-GP	40.86	50.47	0.81	0.69	18.81	13.02	8.50
43	W-408	39.06	51.92	0.75	0.94	15.61	12.36	9.50
44	NHRDF Furasangi	49.73	51.31	0.97	0.76	16.05	13.81	8.50
45	AFLR	51.02	50.46	1.02	0.72	14.39	13.13	9.50
46	NHRDF Red-4	42.34	50.26	0.84	0.88	15.33	12.55	10.00
47	NHRDF Red-2	41.25	48.89	0.85	0.92	13.86	11.92	10.00
48	AFDR	48.33	55.60	1.04	0.78	13.97	11.34	9.50
49	Arakera local	38.39	49.80	0.77	0.70	15.17	11.71	7.50
50	N-53	51.50	52.12	0.91	0.84	15.00	14.66	8.50
	S.Em±	3.66	2.77	0.07	0.09	0.96	0.93	0.60
	CD (5%)	10.41	7.86	0.20	0.26	2.72	2.64	1.70
	CV	11.61	7.46	11.35	15.01	8.80	10.18	10.32

Table 5: Mean performance onion genotypes for the yield parameters During *rabi*- 2024-25

Sl. No.	Genotypes	Average weight of bulb	Bulb yield per plot (kg)	Bulb yield (t/ ha)
1	Arka Bheem	63.43	3.34	33.37
2	Balichakra-W	57.65	3.28	32.77
3	Bagdal Local	55.18	3.75	37.54
4	Arka Kalyan	61.90	4.33	43.32
5	Balichakra-R	57.38	4.49	44.94
6	NHRDF Red	69.13	3.75	37.49
7	Telagi -L	75.35	3.93	39.33
8	Telagi -W	65.90	3.20	31.96
9	Bellary Red	60.38	4.17	41.70
10	GWO-1	66.85	4.14	41.36
11	GJRO-11	56.88	4.00	39.95
12	GJWO-3	64.20	3.37	33.71
13	Bhima Red	61.28	4.18	41.79
14	DOGR-1770	69.68	3.94	39.38
15	DOGR-1760	88.45	4.38	43.79
16	DOGR-1761	69.33	4.14	41.39
17	DOGR-1771	54.30	3.76	37.59
18	DOGR-1773	61.20	3.74	37.36
19	DOGR-1774	66.85	4.01	40.13
20	Bhima Super	76.90	4.01	40.15
21	Bhima Raj	69.33	4.64	46.42
22	Bhima Shakti	74.58	4.12	41.25
23	Bhima Light Red	57.18	4.01	40.07
24	DOGR-1772	60.43	4.18	41.83
25	DOGR-1769	65.45	4.10	41.00
26	DOGR-1768	78.10	3.34	33.38
27	Bhima Dark Red	68.98	3.51	35.13
28	Bhima Kiran	65.25	3.98	39.81
29	W-364 GP	71.18	4.03	40.29
30	Bhima Shweta	54.60	3.88	38.78
31	W-405	58.80	3.09	30.94
32	Bhima Shubra	67.05	3.52	35.20
33	Bhima Safed	54.95	3.89	38.94
34	W-310-GP	66.00	3.47	34.73
35	W-344	62.28	4.12	41.17
36	W-355	77.83	4.10	41.03
37	W-361	68.73	3.77	37.74
38	W-504	53.20	3.37	33.69
39	W-448	58.75	4.01	40.06
40	W-125-GP	69.70	3.58	35.81
41	W-210-GP	59.18	3.41	34.12
42	W-203-GP	61.95	3.76	37.60
43	W-408	65.85	3.97	39.70
44	NHRDF Furasangi	72.35	4.45	44.49
45	AFLR	64.85	4.45	44.51
46	NHRDF Red-4	73.28	4.77	47.72
47	NHRDF Red-2	66.50	5.09	50.89
48	AFDR	61.23	3.89	38.93
49	Arakera local	64.63	3.66	36.64
50	N-53	57.70	3.57	35.68
	S.Em±	5.55	0.28	2.80
	CD (5%)	15.76	0.80	7.95
	CV	12.06	10.11	10.11

Table 6: Mean performance onion genotypes for the incidence of purple blotch and thrips infestations during *rabi*- 2024-25

Sl. No.	Genotypes	Bulb colour	Purple blotch (%)	Thrips
1	Arka Bheem	Red	3.50	4.45
2	Balichakra-W	Light red	2.00	5.98
3	Bagdal Local	Light red	2.50	5.02
4	Arka Kalyan	Red	3.50	2.29
5	Balichakra-R	Light red	1.50	3.88
6	NHRDF Red	Dark red	2.00	4.67
7	Telagi -L	Light red	1.50	3.65
8	Telagi -W	White	3.00	5.57
9	Bellary Red	Red	2.00	1.59
10	GWO-1	White	3.50	4.34
11	GJRO-11	Red	4.00	5.85
12	GJWO-3	White	3.50	4.30
13	Bhima Red	Red	3.50	5.19
14	DOGR-1770	Red	3.00	4.61
15	DOGR-1760	Light red	3.00	4.16
16	DOGR-1761	Dark red	3.50	3.75

17	DOGR-1771	Dark red	2.50	3.93
18	DOGR-1773	Light red	2.50	1.63
19	DOGR-1774	Red	3.00	7.99
20	Bhima Super	Light red	4.00	2.08
21	Bhima Raj	Dark red	3.50	2.07
22	Bhima Shakti	Light red	2.00	4.30
23	Bhima Light Red	Light red	1.00	1.97
24	DOGR-1772	Dark red	2.50	1.91
25	DOGR-1769	Light red	1.00	8.35
26	DOGR-1768	Dark red	2.00	10.93
27	Bhima Dark Red	Dark red	1.00	6.40
28	Bhima Kiran	Light red	2.50	7.99
29	W-364 GP	White	3.50	6.26
30	Bhima Shweta	White	3.00	3.99
31	W-405	White	3.50	11.78
32	Bhima Shubra	White	2.00	1.73
33	Bhima Safed	White	3.00	7.35
34	W-310-GP	White	2.50	3.09
35	W-344	White	2.50	3.32
36	W-355	White	3.00	0.91
37	W-361	White	2.50	2.01
38	W-504	White	2.50	8.94
39	W-448	White	3.00	6.32
40	W-125-GP	White	2.50	12.29
41	W-210-GP	White	3.00	8.41
42	W-203-GP	White	3.50	8.09
43	W-408	White	2.00	5.26
44	NHRDF Furasangi	Light red	1.00	1.21
45	AFLR	Light red	1.00	7.66
46	NHRDF Red-4	Light red	0.00	3.35
47	NHRDF Red-2	Light red	0.00	4.25
48	AFDR	Dark red	2.00	5.15
49	Arakera local	Light red	0.50	0.51
50	N-53	Light red	1.00	6.48
	S.Em±		0.51	0.44
	CD (5%)		1.45	1.25
	CV		29.93	12.61

Conclusion

Genotypes like Bagdal Local, Bhima Safed, NHRDF Red-2 and Arakera local excel in growth and stress tolerance. Recommended for Rabi in Karnataka, with potential yields from literature (e.g., 40-45 t/ha for Bhima Shakti). Further multi-location trials needed.

This study identifies NHRDF Red-2, NHRDF Red-4, Bhima Raj, and Balichakra-R as top performers for yield and quality during rabi 2024-25 at Dharwad. Genotypes with low bolting, thin necks, and pest tolerance (e.g., Telagi-L, Arakera local) are recommended for breeding. Future work should focus on multi-location trials for stability.

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