



Plant Archives

Journal homepage: <http://www.plantarchives.org>

DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2026.v26.supplement-2.011>

IDENTIFICATION OF RESISTANCE SOURCES FOR PURPLE BLOTCH OF ONION (*Alternaria porri*) IN FIELD CONDITIONS

Tejaskumar M. K.^{1*}, Jayalakshmi S.K.², Yenjerappa S.T.³, Ajithkumar K.⁴, Basavaraj S. Kalmath.⁵ and Hemalatha K. J.⁶

¹Department of Plant Pathology, College of Agriculture, University of Agricultural Sciences, Raichur-584104, Karnataka, India

²College of Agriculture, Kalaburagi, University of Agricultural Sciences, Raichur-584104, Karnataka, India

³College of Agriculture, Gangavathi, University of Agricultural Sciences, Raichur-584104, Karnataka, India

⁴AICRP on Linseed, Main Agricultural Research Station, University of Agricultural Sciences, Raichur-584104, Karnataka, India

⁵Department of Entomology, College of Agriculture, University of Agricultural Sciences, Raichur-584104, Karnataka, India

⁶Department of Horticulture, College of Agriculture, University of Agricultural Sciences, Raichur-584104, Karnataka, India

*Corresponding author E-mail: tejaskumar.mkkrs@gmail.com

(Date of Receiving : 26-03-2026; Date of Revision : 17-05-2026; Date of Acceptance : 01-06-2026)

ABSTRACT

The present investigation was carried out during *Kharif* 2024 and *rabi* 2024-25 to identify resistant sources against *Alternaria porri* causing purple blotch of onion under field conditions. A total of 50 onion genotypes/cultivars were evaluated for their reaction to the disease and categorized based on Percent Disease Index (PDI), Area Under Disease Progress Curve (AUDPC) and apparent infection rate (*r*) values. The field screening revealed significant variability among genotypes for resistance to purple blotch. Genotypes Arka Bheem, Arka Kalyan, DOGR-1760, DOGR-1761, Bhima Super, Bhima Dark Red, Bhima Safed, Bhima Shubra and AFLR exhibited strong resistance (PDI: 5–10%) with delayed symptom onset, limited lesion expansion and low AUDPC and *r* values, indicating stable and durable resistance. Moderately resistant genotypes such as Balichakra-T, Bagdal Local, DOGR-1771, DOGR-1773, Bhima Raj and Bhima Kiran showed restricted lesion development while moderately susceptible and susceptible entries recorded higher disease progression. Susceptible genotypes including W-405, W-406, W-344, W-361 and W-504 exhibited early infection, rapid lesion expansion and maximum AUDPC values, confirming their vulnerability. The differential response among genotypes highlights the presence of substantial genetic variability for resistance to *A. porri*. The identified resistant lines can serve as valuable donors in onion breeding programs aimed at developing cultivars with durable field resistance to purple blotch.

Keywords: Onion, purple blotch, resistant sources, *Alternaria porri*, Area Under Disease Progress Curve, apparent infection rate.

Introduction

Onion (*Allium cepa* L.) commonly referred to as the “Queen of the Kitchen,” is one of the most widely cultivated and economically significant vegetable crops worldwide. It is ranked among the five most important fresh market vegetables globally belonging to the family *Alliaceae* (Cramer, 2000). The major onion

producing states in India include Maharashtra, Madhya Pradesh, Karnataka, Rajasthan and Gujarat which together contribute more than 80 per cent of the national output. India not only fulfills its domestic demand but also serves as a leading exporter of fresh onions to countries such as Bangladesh, Sri Lanka, Malaysia and the UAE. However fluctuations in

domestic production due to climatic variability and disease outbreaks periodically affect both domestic prices and export stability (Jadhav *et al.*, 2022 & Wakchaure *et al.*, 2023).

The organosulphur compound allyl propyl disulphide ($C_6H_{12}S_2$) responsible for the characteristic pungency of onion exhibits anticarcinogenic properties and contributes to the prevention of lifestyle related diseases (Kim *et al.*, 2022). Moreover, onion displays antibacterial, antifungal, antihelminthic, antiinflammatory, antiseptic and antispasmodic activities earning it recognition in Ayurvedic and Homeopathic systems of medicine as a potent therapeutic agent (Dar *et al.*, 2020). The Directorate of Onion and Garlic Research (DOGR), Pune, has been instrumental in developing high yielding, disease resistant and region specific onion varieties. Since its inception, several improved varieties and hybrids have been released including Arka Kalyan, Arka Niketan, Arka Bheem, Bhima Super, Bhima Red, Bhima Shakti, Bhima Kiran, Bhima Dark Red, Bhima Raj, Bhima Shweta and Bhima Light Red among others. These varieties have been bred for attributes such as bolting resistance, shelflife, disease tolerance and regional adaptability thereby enhancing the national onion productivity and export potential (Muthaiah *et al.*, 2021).

With the above background and the preamble the present investigation has been undertaken with the identification of resistance sources for purple blotch of onion (*Alternaria porri*) in field conditions

Material and Methods

The screening experiment was conducted under field condition at Main Agricultural Research Station (Horticulture unit), University of Agricultural Sciences, Raichur to find out the sources of resistance to purple blotch of onion. A total of 50 onion cultivars or genotypes, advanced breeding lines and local landraces were collected from different institutes and regions of India to represent the wide genetic base for the present investigation.

The improved varieties such as Arka Bheem and Arka Kalyan (resistant check) were obtained from the Indian Institute of Horticultural Research (IIHR), Bengaluru. Local cultivars such as Balichakra-T, Balichakra Local, Bagdal Local, Parmankallur, Telagi-R, Telagi-W and Bellary Red were included to represent regionally adapted farmer selections. From Gujarat Agricultural Universities, lines like GWO-1,

GJRO-11 and GJWO-3 were collected. A series of advanced breeding lines (DOGR-1760, DOGR-1761, DOGR-1768, DOGR-1769, DOGR-1771, DOGR-1772, DOGR-1773 and DOGR-1774) along with released Bhima group varieties (Bhima Red, Bhima Super, Bhima Raj, Bhima Shakti, Bhima Light Red, Bhima Dark Red, Bhima Kiran, Bhima Shweta (susceptible check), Bhima Shubra and Bhima Safed) which were procured from the Directorate of Onion and Garlic Research (DOGR), Pune. In addition, several white onion lines (W-125-GP, W-203-GP, W-210-GP, W-310-GP, W-344, W-355, W-361, W-364 GP, W-405, W-406, W-408, W-448 and W-504) were included from DOGR and associated programs. From the National Horticultural Research and Development Foundation (NHRDF), Nashik, varieties such as NHRDF Furasangi, NHRDF Red-3, NHRDF Red-4 and NHRDF-L-28 were collected along with advanced selections like AFLR (Advanced Furasangi Light Red) and AFDR (Advanced Furasangi Dark Red). The widely cultivated check variety N-53 was also included in the study.

Nursery and seedbed prepared to sow the seeds of 50 cultivars or genotypes were sown to raise seedlings. The appropriate amount of manure and fertilizers was applied to the nursery bed. The 50 cultivars or genotypes were collected and were transplanted in field condition in randomized complete block design with two replications. Fertilizers were applied as a basal dose and top dressing as per package of practice. Transplanting of 50 cultivars or genotypes to the main field was done 45 days after sowing, the crop was artificially inoculated (7 days after transplanting) with *Alternaria porri* (10^6 spores ml^{-1}) by foliar spraying of a conidial suspension which was standardized using haemocytometer to ensure uniform disease establishment. Jaggery at 0.2 per cent was added to the conidial or cell suspension as a wetting agent. Observations on disease severity was recorded at seven days interval by using 0 to 5 scale (Mayee and Datar, 1986), Muthaiah *et al.* (2021) and Chauhan *et al.* (2024).

Disease severity was recorded from each treatment block of each cultivar or genotype with observations taken at seven day intervals from the onset of symptoms until physiological maturity of the crop. The cultivars or genotypes were grouped into different categories of resistance and susceptibility on the basis of method given by Pathak *et al.* 1986.

Disease severity rating scale for purple blotch

Scale	Description	Disease severity (%)	Host reaction
0	No disease symptoms	<5	Immune
1	A few spots towards tip covering 10 per cent leaf area	5-10	Resistant
2	Several dark purplish brown patches covering up to 20 per cent leaf area	11-20	Moderately resistant
3	Several patches with pale outer zone covering up to 40 per cent leaf area	21-40	Moderately susceptible
4	Leaf streaks covering up to 75 per cent leaf area or breaking of the leaves from centre	41-60	Susceptible
5	Complete drying of the leaves or breaking of leaves from centre	>60	Highly susceptible

The per cent disease index was calculated by using the formula given by Wheeler (1969).

$$\text{Per cent disease index} = \frac{\text{Sum of all individual disease ratings} \times 100}{\text{No. of leaves observed} \times \text{Maximum disease grade}}$$

Experiment details:

Crop	Onion
Genotypes/ varieties	50
Replication	2
Spacing	15 × 10 cm
Plot size	0.5 × 1 m (6 rows)
Location	Horticulture unit, MARS, U.A.S, Raichur
Design	RCBD
Planting method	Transplanting
Irrigation method	Drip

Treatment details:

S. No.	Genotypes/ cultivars
IIHR, Bengaluru, Improved varieties	
1	Arka bheem
2	Arka kalyan
Local cultivars, Karnataka	
3	Balichakra-t
4	Bagdal Local
5	Balichakra Local
6	Parmankallur
7	Telagi-R
8	Telagi-W
9	Ballari red
Gujarat Agriculture University, Gujarat genotypes	
10	GWO-1
11	GJRO-11
12	GJWO-3
Directorate of Onion and Garlic Research, Pune, Genotypes	
13	DOGR-1771
14	DOGR-1760
15	DOGR-1761
16	DOGR-1773
17	DOGR-1774
18	DOGR-1772
19	DOGR-1769
20	DOGR-1768
Directorate of Onion and Garlic Research, Pune, Bhima varieties	
21	Bhima shweta
22	Bhima super

23	Bhima raj
24	Bhima shakti
25	Bhima light red
26	Bhima dark red
27	Bhima kiran
28	Bhima red
29	Bhima safed
30	Bhima shubra
Directorate of Onion and Garlic Research, Pune, White onion genotypes	
31	W-364 GP
32	W-405
33	W-406
34	W-310-GP
35	W-344
36	W-355
37	W-361
38	W-504
39	W-448
40	W-125-GP
41	W-210-GP
42	W-203-GP
43	W-408
National Horticultural Research and Development Foundation, Nashik, Varieties	
44	NHRDF Furasangi
45	NHRDF Red-4
46	NHRDF Red-3
47	NHRDF-L- 28
National Horticultural Research and Development Foundation, Nashik, Advanced varieties	
48	AFLR
49	AFDR
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check	
50	N-53

Results and Discussion

Field evaluation of 50 onion genotypes/ cultivars against purple blotch during *Kharif* 2024 revealed significant variation in disease incidence and progression across different genotypes. Disease

progress was recorded at weekly intervals from 35th to 45th standard meteorological weeks (SMWs) and the final disease intensity was used to categorize the genotypes into resistant (R), moderately resistant (MR), moderately susceptible (MS), susceptible (S) and highly susceptible (HS) reaction groups (Table 1 and 2).

The field response of onion genotypes against purple blotch and the evaluated entries were classified into five distinct categories based on their host reaction expressed in terms of Percent Disease Index (PDI). These categories included resistant (R), moderately resistant (MR), moderately susceptible (MS), susceptible (S) and highly susceptible (HS). The classification was based on disease intensity observed during the field trials conducted in the *Kharif* 2024.

Genotypes that recorded PDI of 5-10 per cent were classified as resistant (R). This group included Arka Bheem, Arka Kalyan, DOGR-1760, DOGR-1761, Bhima Super, Bhima Dark Red, Bhima Safed, Bhima Shubra and AFLR. These entries showed minimum disease intensity with delayed disease onset and limited lesion expansion indicating strong genetic resistance against *Alternaria porri*. The resistance observed in these genotypes is consistent with their minimum AUDPC and *r* values (Tables 3 and 4) suggesting that they can effectively restrict both the onset and spread of purple blotch under field condition.

The moderately resistant (MR) genotypes with PDI ranging from 11 to 20 per cent included genotypes such as Balichakra-t, Bagdal Local, Balichakra Local, DOGR-1771, DOGR-1773, DOGR-1774, Bhima Raj, Bhima Light Red, DOGR-1772, DOGR-1769, DOGR-1768, Bhima Kiran and AFDR. While these genotypes exhibited some degree of disease expression, lesion size and spread were moderate. Their *r* values were also relatively minimum to moderate reflecting controlled disease progression. These genotypes may not be as ideal as resistant entries but they still represent stable cultivars that can perform under minimum to moderate disease pressure.

Entries falling within the moderately susceptible (MS) category with PDI values between 21 and 40 per cent showed intermediate disease intensity. This group included Parmakallur, Telagi-R, Telagi-W, Bellary Red, GWO-1, GJRO-11, GJWO-3, Bhima Red, Bhima Shakti, Bhima Shweta, NHRDF Furasangi, NHRDF Red-4, NHRDF Red-3, NHRDF-L 28 and N-53. While not completely overwhelmed by the pathogen, these genotypes showed progressive lesion development indicating incomplete or partial resistance. Disease progression in these entries was more rapid than in R

or MR genotypes as evidenced by relatively maximum *r* values.

The susceptible (S) group included genotypes with PDI values between 41-60 per cent comprising W-364 GP, W-310 GP, W-125 GP, W-210 GP and W-203 GP. These entries showed clear disease symptoms early in the crop cycle and experienced sustained disease progression and also reflected by maximum AUDPC scores and moderately high *r* values. They exhibited poor field resistance and are considered less suitable for cultivation in regions with maximum purple blotch intensity unless disease management is tightly controlled.

Finally, genotypes with PDI > 60 per cent were categorized as highly susceptible (HS). These included W-405, W-406, W-408, W-344, W-355, W-361, W-504 and W-448. These genotypes showed early disease onset, rapid lesion expansion and maximum disease intensity throughout the crop cycle. Their classification into the HS category is supported by maximum values of AUDPC (W-405 of 2992.50) Such rapid and intense disease expression reflects their inherent susceptibility making them unsuitable for commercial cultivation.

The present study highlights the differential response of onion genotypes to purple blotch under field condition during *Kharif* 2024. The observed variability in disease severity among the 50 genotypes indicates the presence of genetic diversity for resistance to *Alternaria porri*. The identification of resistant genotypes such as Arka bheem, Arka kalyan, DOGR-1760, DOGR-1761, Bhima super, Bhima dark red, Bhima safed, Bhima shubra and AFLR is particularly promising as these lines showed delayed onset of symptoms and significantly lower progression rates. This finding corroborates earlier reports where traditional and region specific onion cultivars demonstrated higher levels of resistance due to inherent physiological and biochemical defense mechanisms (Chethana *et al.*, 2011) and (Kushal *et al.*, 2015). On the contrary, highly susceptible genotypes such as W-405, W-406 and W-364 GP showed rapid disease severity confirming their vulnerability to purple blotch (Muthaiah *et al.*, 2021).

A total of 50 onion genotypes were evaluated for their reaction to purple blotch under field conditions during *rabi* 2024–25. Based on the per cent disease index (PDI) genotypes were grouped into resistant (R), moderately resistant (MR), moderately susceptible (MS) and susceptible (S) categories (Table 5 and 6).

Among the tested entries, Arka Bheem, Arka Kalyan, DOGR-1760, DOGR-1761, Bhima Super, Bhima Dark Red, Bhima Safed, Bhima Shubra and

AFLR expressed a resistant reaction with PDI of 5-10 per cent indicating their stable resistance to purple blotch. A second group of genotypes including Balichakra-T, Bagdal Local, Balichakra Local, DOGR-1771, DOGR-1773, DOGR-1774, Bhima Raj, Bhima Light Red, DOGR-1772, DOGR-1769, DOGR-1768, Bhima Kiran and AFDR were classified as moderately resistant with PDI ranging between 11–20 per cent.

Genotypes such as Parmankallur, Telagi-R, Telagi-W, Bellary Red, GWO-1, GJRO-11, GJWO-3, Bhima Red, Bhima Shakti, Bhima Shweta, NHRDF Furasangi, NHRDF Red-4, NHRDF Red-3, NHRDF-L-28 and N-53 fell into the moderately susceptible category (21–40% PDI).

The temporal progression of purple blotch severity was quantified using AUDPC values (Table 7). Considerable variation was observed among the evaluated onion genotypes. The resistant group, including Arka Bheem, Arka Kalyan, DOGR-1760, DOGR-1761, Bhima Super, Bhima Safed, Bhima Shubra and AFLR recorded the minimum AUDPC values indicating stable resistance to purple blotch under field condition.

In contrast, susceptible genotypes such as W-405, W-406, W-310 GP, W-344, W-355, W-361, W-504, W-448, W-125 GP, W-210 GP, W-203 GP and W-408 exhibited maximum AUDPC values clearly indicating their vulnerability under epiphytotic condition. The epidemic development of purple blotch under field condition was quantified by calculating the apparent infection rate (*r* value) (Table 8). A clear variability in disease progression was recorded among the evaluated genotypes.

Resistant genotypes such as Arka Bheem, Arka Kalyan, DOGR-1760, DOGR-1761, Bhima Super, Bhima Safed and Bhima Shubra showed the minimum *r* values reflecting a slower disease build up and maximum levels of resistance.

By contrast, susceptible genotypes including W-405, W-406, W-310 GP, W-344, W-355, W-361, W-504, W-448, W-125 GP, W-210 GP, W-203 GP and W-408 recorded the maximum *r* values confirming their inability to restrict the rapid development of purple blotch under conducive field condition.

The differential AUDPC values among onion genotypes highlight the variability in disease progression and host pathogen interactions. Resistant genotypes like Arka Bheem and Bhima Super maintained consistently lower AUDPC confirming their potential as promising sources of durable resistance. These findings align with earlier studies by Pavan *et al.* (2020) and Kumar *et al.* (2021) reported

that resistant cultivars often restrict lesion expansion and reduce pathogen sporulation, thereby lowering cumulative disease pressure.

Conversely, the identification of susceptible genotypes such as W-364 GP and W-448 highlights the genetic vulnerability in certain popular cultivars. Similar findings were reported by Gupta *et al.* (2017) where commonly grown open-pollinated varieties displayed maximum PDI under field condition. The significant differences in *r* values among onion genotypes emphasize the contrasting abilities of resistant and susceptible cultivars to slow down disease progress. Resistant genotypes such as Bhima Safed and Arka Bheem with minimum *r*-values, demonstrated strong potential to hinder pathogen colonization and epidemic build up aligning with their minimum AUDPC values recorded earlier. This supports the concept that resistant cultivars suppress both the onset and progression of purple blotch (Plate 1).

In contrast, the higher *r* values of susceptible genotypes (W-405, W-406) indicate a conducive host-pathogen interaction favouring rapid disease progression. Similar susceptibility of popular onion cultivars to purple blotch epidemics was reported by Gupta *et al.* (2017) and Kumar *et al.* (2021), reinforcing the need to discourage their large-scale cultivation in endemic regions.

Conclusion

The field screening during *Kharif* 2024 and *rabi* 2024–25 revealed considerable genetic variability among onion genotypes for resistance to purple blotch. Resistant genotypes (PDI: 5–10%) such as Arka Bheem, Arka Kalyan, DOGR-1760, DOGR-1761, Bhima Super, Bhima Dark Red, Bhima Safed, Bhima Shubra and AFLR consistently showed delayed symptom onset, limited lesion expansion and minimum disease progression. These entries recorded the lowest AUDPC and *r* values indicating their potential as stable sources of resistance. The resistance was effective across both seasons reflecting their genetic stability and adaptability to varied environmental conditions.

Moderately resistant genotypes (PDI: 11–20%), including Balichakra-T, Bagdal Local, DOGR-1771, DOGR-1773, Bhima Raj, Bhima Kiran and others, exhibited moderate disease symptoms with limited lesion spread. These lines can serve as backup material for breeding programs or be recommended for regions with lower disease pressure.

Moderately susceptible genotypes (PDI: 21–40%) such as Parmakallur, Telagi-R, Bellary Red, Bhima Red, NHRDF Red-3, N-53, *etc.*, displayed intermediate

disease reactions and faster lesion development compared to R and MR entries. Their higher *r* values reflect incomplete resistance and warrant further screening under managed environments.

The susceptible (S) and highly susceptible (HS) genotypes with PDI > 40 per cent were particularly vulnerable. Genotypes like W-405, W-406, W-344, W-

361 and W-504 showed early disease onset and rapid progression, with maximum AUDPC and *r* values making them unsuitable for cultivation in disease-prone areas. Their susceptibility underlines the need to exclude them from commercial recommendations and breeding programs unless resistance traits are introgressed.

Table 1 Performance of onion genotypes against purple blotch in the field during *Kharif* 2024.

SI NO.	Genotypes/ cultivars	Disease progress at weekly interval (%)											PDI	Disease reaction
		(35 th)*	(36 th)	(37 th)	(38 th)	(39 th)	(40 th)	(41 st)	(42 nd)	(43 rd)	(44 th)	(45 th)		
		28/08	04/09	11/09	18/09	25/09	02/10	09/10	16/10	23/10	30/10	06/11		
IIHR, Bengaluru, Improved varieties														
1	Arka bheem	0.0	0.0	0.0	0.0	0.0	2.5	2.5	5.0	7.5	7.5	10.0	10.0	R
2	Arka kalyan	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	5.0	7.5	7.5	7.5	R
Local cultivars, Karnataka														
3	Balichakra-t	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	10.0	15.0	15.0	MR
4	Bagdal Local	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	12.5	15.0	15.0	MR
5	Balichakra Local	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	12.5	12.5	15.0	15.0	MR
6	Parmankallur	0.0	0.0	5.0	10.0	15.0	17.5	22.5	25.0	27.5	32.5	37.5	37.5	MS
7	Telagi-R	0.0	0.0	0.0	0.0	5.0	12.5	20.0	25.0	27.5	32.5	35.0	35.0	MS
8	Telagi-W	0.0	0.0	5.0	10.0	12.5	17.5	20.0	25.0	27.5	32.5	35.0	35.0	MS
9	Ballari red	0.0	0.0	5.0	10.0	15.0	17.5	22.5	25.0	27.5	32.5	37.5	37.5	MS
Gujarat Agriculture University, Gujarat genotypes														
10	GWO-1	0.0	0.0	0.0	5.0	10.0	15.0	17.5	20.0	25.0	32.5	35.0	35.0	MS
11	GJRO-11	0.0	0.0	0.0	5.0	10.0	17.5	20.0	25.0	27.5	32.5	35.0	35.0	MS
12	GJWO-3	0.0	0.0	0.0	2.5	10.0	17.5	20.0	27.5	30.0	35.0	35.0	35.0	MS
Directorate of Onion and Garlic Research, Pune, Genotypes														
13	DOGR-1771	0.0	0.0	0.0	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	17.5	MR
14	DOGR-1760	0.0	0.0	0.0	0.0	0.0	2.5	5.0	5.0	7.5	7.5	10.0	10.0	R
15	DOGR-1761	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	7.5	10.0	10.0	R
16	DOGR-1773	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	12.5	15.0	15.0	MR
17	DOGR-1774	0.0	0.0	0.0	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	17.5	MR
18	DOGR-1772	0.0	0.0	0.0	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	17.5	MR
19	DOGR-1769	0.0	0.0	0.0	2.5	5.0	5.0	7.5	7.5	10.0	12.5	15.0	15.0	MR
20	DOGR-1768	0.0	0.0	0.0	2.5	5.0	7.5	10.0	10.0	12.5	15.0	17.5	17.5	MR
Directorate of Onion and Garlic Research, Pune, Bhima varieties														
21	Bhima shweta	0.0	0.0	5.0	10.0	12.5	15.0	22.5	25.0	27.5	32.5	37.5	37.5	MS
22	Bhima super	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	R
23	Bhima raj	0.0	0.0	0.0	2.5	5.0	7.5	10.0	10.0	12.5	15.0	17.5	17.5	MR
24	Bhima shakti	0.0	0.0	2.5	5.0	10.0	12.5	15.0	17.5	20.0	22.5	25.0	25.0	MS
25	Bhima light red	0.0	0.0	0.0	0.0	2.5	5.0	10.0	12.5	15.0	17.5	20.0	20.0	MR
26	Bhima dark red	0.0	0.0	0.0	0.0	0.0	2.5	5.0	5.0	7.5	7.5	10.0	10.0	R
27	Bhima kiran	0.0	0.0	0.0	2.5	5.0	5.0	7.5	7.5	10.0	12.5	15.0	15.0	MR
28	Bhima red	0.0	0.0	0.0	0.0	0.0	0.0	10.0	15.0	20.0	25.0	25.0	25.0	MS
29	Bhima safed	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	5.0	7.5	10.0	10.0	R
30	Bhima shubra	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	5.0	7.5	10.0	10.0	R
Directorate of Onion and Garlic Research, Pune, White onion genotypes														
31	W-364 GP	0.0	0.0	2.5	5.0	10.0	12.5	15.0	20.0	35.0	47.5	50.0	50.0	S
32	W-405	5.0	12.5	20.0	27.5	35.0	47.5	55.0	60.0	65.0	67.5	70.0	70.0	HS
33	W-406	0.0	2.5	5.0	12.5	25.0	32.5	40.0	45.0	47.5	55.0	62.5	62.5	HS
34	W-310-GP	0.0	0.0	5.0	12.5	17.5	25.0	32.5	37.5	40.0	47.5	50.0	50.0	S
35	W-344	0.0	0.0	5.0	15.0	32.5	42.5	45.0	47.5	50.0	57.5	62.5	62.5	HS
36	W-355	0.0	0.0	5.0	17.5	30.0	42.5	45.0	47.5	52.5	57.5	65.0	65.0	HS
37	W-361	0.0	0.0	5.0	20.0	35.0	40.0	42.5	45.0	50.0	57.5	65.0	65.0	HS
38	W-504	0.0	0.0	7.5	17.5	32.5	42.5	47.5	50.0	52.5	60.0	67.5	67.5	HS

39	W-448	0.0	0.0	7.5	17.5	32.5	42.5	45.0	47.5	50.0	60.0	65.0	65.0	HS
40	W-125-GP	0.0	0.0	0.0	5.0	15.0	22.5	27.5	32.5	37.5	45.0	47.5	47.5	S
41	W-210-GP	0.0	0.0	0.0	0.0	5.0	10.0	17.5	25.0	40.0	42.5	50.0	50.0	S
42	W-203-GP	0.0	0.0	0.0	5.0	15.0	25.0	35.0	37.5	45.0	47.5	55.0	55.0	S
43	W-408	0.0	0.0	5.0	17.5	32.5	42.5	45.0	47.5	50.0	60.0	65.0	65.0	HS
National Horticultural Research and Development Foundation, Nashik, Varieties														
44	NHRDF Furasangi	0.0	0.0	0.0	0.0	5.0	10.0	12.5	15.0	17.5	22.5	25.0	25.0	MS
45	NHRDF Red-4	0.0	0.0	0.0	0.0	5.0	7.5	10.0	15.0	22.5	25.0	25.0	25.0	MS
46	NHRDF Red-3	0.0	0.0	0.0	0.0	0.0	5.0	12.5	15.0	20.0	25.0	27.5	27.5	MS
47	NHRDF-L- 28	0.0	0.0	5.0	12.5	15.0	20.0	25.0	27.5	30.0	32.5	35.0	35.0	MS
National Horticultural Research and Development Foundation, Nashik, Advanced varieties														
48	AFLR	0.0	0.0	0.0	0.0	0.0	2.5	5.0	5.0	5.0	7.5	10.0	10.0	R
49	AFDR	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	12.5	15.0	15.0	MR
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check														
50	N-53	0.0	0.0	5.0	10.0	15.0	17.5	25.0	27.5	30.0	32.5	37.5	37.5	MS

* Figures in parentheses are standard meteorological weeks

Table 2. Categorization of onion genotypes based on host reaction to purple blotch under *Kharif* 2024

Sl. NO.	Disease reaction	PDI	Genotypes/ cultivars
1	R	5-10	Arka bheem, Arka kalyan, DOGR-1760, DOGR-1761, Bhima super, Bhima dark red, Bhima safed, Bhima shubra, AFLR
2	MR	11-20	Balichakra-t, Bagdal Local, Balichakra Local, DOGR-1771, DOGR-1773, DOGR-1774, Bhima raj, Bhima light red, DOGR-1772, DOGR-1769, DOGR-1768, Bhima kiran, AFDR
3	MS	21-40	Parmankallur, Telagi-R, Telagi-W, Ballari red, GWO-1, GJRO-11, GJWO-3, Bhima red, Bhima shakti, Bhima Shweta, NHRDF Furasangi, NHRDF Red-4, NHRDF Red-3, NHRDF-L- 28, N-53
4	S	41-60	W-364 GP, W-310-GP, W-125-GP, W-210-GP, W-203-GP
5	HS	>60	W-405, W-406, W-408, W-344, W-355, W-361, W-504, W-448

Table 3 : Area under disease progress curve for different onion genotypes in field during *Kharif* 2024

S. No.	Genotypes/ cultivars	28/08	04/09	11/09	18/09	25/09	02/10	09/10	16/10	23/10	30/10	06/11	AUDPC value
Indian Institute of Horticultural Research, Bengaluru, Improved varieties													
1	Arka bheem	0.00	0.00	0.00	0.00	0.00	8.75	17.50	26.25	43.75	52.50	61.25	210.00
2	Arka kalyan	0.00	0.00	0.00	0.00	0.00	0.00	8.75	17.50	26.25	43.75	52.50	148.75
Local cultivars, Karnataka													
3	Balichakra-t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	52.50	87.50	175.00
4	Bagdal Local	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	61.25	96.25	192.50
5	Balichakra Local	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	78.75	87.50	96.25	455.00
6	Parmankallur	0.00	0.00	17.50	52.50	87.50	113.75	140.00	166.25	183.75	210.00	245.00	1216.25
7	Telagi-R	0.00	0.00	0.00	0.00	17.50	61.25	113.75	157.50	183.75	210.00	236.25	980.00
8	Telagi-W	0.00	0.00	17.50	52.50	78.75	105.00	131.25	157.50	183.75	210.00	236.25	1172.50
9	Ballari red	0.00	0.00	17.50	52.50	87.50	113.75	140.00	166.25	183.75	210.00	245.00	1216.25
Gujarat Agriculture University, Gujarat, Genotypes													
10	GWO-1	0.00	0.00	0.00	17.50	52.50	87.50	113.75	131.25	157.50	201.25	236.25	997.50
11	GJRO-11	0.00	0.00	0.00	17.50	52.50	96.25	131.25	157.50	183.75	210.00	236.25	1085.00
12	GJWO-3	0.00	0.00	0.00	8.75	43.75	96.25	131.25	166.25	201.25	227.50	245.00	1120.00
Directorate of Onion and Garlic Research, Pune, Genotypes													
13	DOGR-1771	0.00	0.00	0.00	0.00	8.75	26.25	43.75	61.25	78.75	96.25	113.75	428.75
14	DOGR-1760	0.00	0.00	0.00	0.00	0.00	8.75	26.25	35.00	43.75	52.50	61.25	227.50
15	DOGR-1761	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	43.75	61.25	140.00
16	DOGR-1773	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	70.00	78.75	96.25	437.50
17	DOGR-1774	0.00	0.00	0.00	0.00	8.75	26.25	43.75	61.25	78.75	96.25	113.75	428.75
18	DOGR-1772	0.00	0.00	0.00	0.00	8.75	26.25	43.75	61.25	78.75	96.25	113.75	428.75
19	DOGR-1769	0.00	0.00	0.00	8.75	26.25	35.00	43.75	52.50	61.25	78.75	96.25	402.50
20	DOGR-1768	0.00	0.00	0.00	8.75	26.25	43.75	61.25	70.00	78.75	96.25	113.75	498.75

Directorate of Onion and Garlic Research, Pune, Bhima varieties													
21	Bhima shweta	0.00	0.00	17.50	52.50	78.75	96.25	131.25	166.25	183.75	210.00	245.00	1181.25
22	Bhima super	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	192.50
23	Bhima raj	0.00	0.00	0.00	8.75	26.25	43.75	61.25	70.00	78.75	96.25	113.75	498.75
24	Bhima shakti	0.00	0.00	8.75	26.25	52.50	78.75	96.25	113.75	131.25	148.75	166.25	822.50
25	Bhima light red	0.00	0.00	0.00	0.00	8.75	26.25	52.50	78.75	96.25	113.75	131.25	507.50
26	Bhima dark red	0.00	0.00	0.00	0.00	0.00	8.75	26.25	35.00	43.75	52.50	61.25	227.50
27	Bhima kiran	0.00	0.00	0.00	8.75	26.25	35.00	43.75	52.50	61.25	78.75	96.25	402.50
28	Bhima red	0.00	0.00	0.00	0.00	0.00	0.00	35.00	87.50	122.50	157.50	175.00	577.50
29	Bhima safed	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	35.00	43.75	61.25	175.00
30	Bhima shubra	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	35.00	43.75	61.25	175.00
Directorate of Onion and Garlic Research, Pune, White onion genotypes													
31	W-364 GP	0.00	0.00	8.75	26.25	52.50	78.75	96.25	122.50	192.50	288.75	341.25	1207.50
32	W-405	0.00	61.25	113.75	166.25	218.75	288.75	358.75	402.50	437.50	463.75	481.25	2992.50
33	W-406	0.00	8.75	26.25	61.25	131.25	201.25	253.75	297.50	323.75	358.75	411.25	2073.75
34	W-310-GP	0.00	0.00	17.50	61.25	105.00	148.75	201.25	245.00	271.25	306.25	341.25	1697.50
35	W-344	0.00	0.00	17.50	70.00	166.25	262.50	306.25	323.75	341.25	376.25	420.00	2283.75
36	W-355	0.00	0.00	17.50	78.75	166.25	253.75	306.25	323.75	350.00	385.00	428.75	2310.00
37	W-361	0.00	0.00	17.50	87.50	192.50	262.50	288.75	306.25	332.50	376.25	428.75	2292.50
38	W-504	0.00	0.00	26.25	87.50	175.00	262.50	315.00	341.25	358.75	393.75	446.25	2406.25
39	W-448	0.00	0.00	26.25	87.50	175.00	262.50	306.25	323.75	341.25	385.00	437.50	2345.00
40	W-125-GP	0.00	0.00	0.00	17.50	70.00	131.25	175.00	210.00	245.00	288.75	323.75	1461.25
41	W-210-GP	0.00	0.00	0.00	0.00	17.50	52.50	96.25	148.75	227.50	288.75	323.75	1155.00
42	W-203-GP	0.00	0.00	0.00	17.50	70.00	140.00	210.00	253.75	288.75	323.75	358.75	1662.50
43	W-408	0.00	0.00	17.50	78.75	175.00	262.50	306.25	323.75	341.25	385.00	437.50	2327.50
National Horticultural Research and Development Foundation, Nashik, Varieties													
44	NHRDF Furasangi	0.00	0.00	0.00	0.00	17.50	52.50	78.75	96.25	113.75	140.00	166.25	665.00
45	NHRDF Red-4	0.00	0.00	0.00	0.00	17.50	43.75	61.25	87.50	131.25	166.25	175.00	682.50
46	NHRDF Red-3	0.00	0.00	0.00	0.00	0.00	17.50	61.25	96.25	122.50	157.50	183.75	638.75
47	NHRDF-L- 28	0.00	0.00	17.50	61.25	96.25	122.50	157.50	183.75	201.25	218.75	236.25	1295.00
National Horticultural Research and Development Foundation, Nashik, Advanced varieties													
48	AFLR	0.00	0.00	0.00	0.00	0.00	8.75	26.25	35.00	35.00	43.75	61.25	210.00
49	AFDR	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	70.00	78.75	96.25	437.50
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check													
50	N-53	0.00	0.00	17.50	52.50	87.50	113.75	148.75	183.75	201.25	218.75	245.00	1268.75

Table 4 : Rate of disease development (r) among different onion genotypes against purple blotch in field during Kharif 2024

S. No.	Genotypes/ cultivars	28/08	04/09	11/09	18/09	25/09	02/10	09/10	16/10	23/10	30/10	06/11	r value
Indian Institute of Horticultural Research, Bengaluru, Improved varieties													
1	Arka bheem	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.019
2	Arka kalyan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.015
Local cultivars, Karnataka													
3	Balichakra-t	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.107	0.066	0.025
4	Bagdal Local	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.142	0.030	0.025
5	Balichakra Local	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.036	0.000	0.030	0.025
6	Parmankallur	0.000	0.000	0.000	0.107	0.066	0.026	0.045	0.020	0.018	0.034	0.031	0.032
7	Telagi-R	0.000	0.000	0.000	0.000	0.000	0.142	0.080	0.041	0.018	0.034	0.016	0.030
8	Telagi-W	0.000	0.000	0.000	0.107	0.036	0.056	0.023	0.041	0.018	0.034	0.016	0.030
9	Ballari red	0.000	0.000	0.000	0.107	0.066	0.026	0.045	0.020	0.018	0.034	0.031	0.032
Gujarat Agriculture University, Gujarat genotypes													
10	GWO-1	0.000	0.000	0.000	0.000	0.107	0.066	0.026	0.023	0.041	0.052	0.016	0.030
11	GJRO-11	0.000	0.000	0.000	0.000	0.107	0.092	0.023	0.041	0.018	0.034	0.016	0.030
12	GJWO-3	0.000	0.000	0.000	0.000	0.209	0.092	0.023	0.059	0.017	0.033	0.000	0.039
Directorate of Onion and Garlic Research, Pune, Genotypes													
13	DOGR-1771	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.036	0.030	0.026	0.027
14	DOGR-1760	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.019
15	DOGR-1761	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.019

16	DOGR-1773	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.000	0.036	0.030	0.025
17	DOGR-1774	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.036	0.030	0.026	0.027
18	DOGR-1772	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.036	0.030	0.026	0.027
19	DOGR-1769	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.036	0.030	0.025
20	DOGR-1768	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.000	0.036	0.030	0.026	0.027
Directorate of Onion and Garlic Research, Pune, Bhima varieties													
21	Bhima shweta	0.000	0.000	0.000	0.107	0.036	0.030	0.071	0.020	0.018	0.034	0.031	0.032
22	Bhima super	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.019
23	Bhima raj	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.000	0.036	0.030	0.026	0.027
24	Bhima shakti	0.000	0.000	0.000	0.103	0.107	0.036	0.030	0.026	0.023	0.021	0.020	0.033
25	Bhima light red	0.000	0.000	0.000	0.000	0.000	0.103	0.107	0.036	0.030	0.026	0.023	0.030
26	Bhima dark red	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.019
27	Bhima kiran	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.036	0.030	0.025
28	Bhima red	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.050	0.041	0.000	0.014
29	Bhima safed	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.019
30	Bhima shubra	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.019
Directorate of Onion and Garlic Research, Pune, White onion genotypes													
31	W-364 GP	0.000	0.000	0.000	0.103	0.107	0.036	0.030	0.050	0.109	0.074	0.014	0.048
32	W-405	0.000	0.142	0.080	0.059	0.050	0.074	0.043	0.029	0.030	0.016	0.017	0.049
33	W-406	0.000	0.000	0.103	0.142	0.121	0.052	0.046	0.029	0.014	0.043	0.044	0.054
34	W-310-GP	0.000	0.000	0.000	0.142	0.056	0.064	0.052	0.031	0.015	0.044	0.014	0.038
35	W-344	0.000	0.000	0.000	0.173	0.143	0.061	0.014	0.014	0.014	0.043	0.030	0.045
36	W-355	0.000	0.000	0.000	0.199	0.100	0.078	0.014	0.014	0.029	0.029	0.045	0.046
37	W-361	0.000	0.000	0.000	0.222	0.109	0.030	0.015	0.014	0.029	0.043	0.045	0.046
38	W-504	0.000	0.000	0.000	0.137	0.117	0.061	0.029	0.014	0.014	0.044	0.046	0.042
39	W-448	0.000	0.000	0.000	0.137	0.117	0.061	0.014	0.014	0.014	0.058	0.030	0.041
40	W-125-GP	0.000	0.000	0.000	0.000	0.173	0.071	0.038	0.034	0.031	0.044	0.014	0.037
41	W-210-GP	0.000	0.000	0.000	0.000	0.000	0.107	0.092	0.064	0.099	0.015	0.043	0.038
42	W-203-GP	0.000	0.000	0.000	0.000	0.173	0.091	0.068	0.015	0.044	0.014	0.043	0.041
43	W-408	0.000	0.000	0.000	0.199	0.117	0.061	0.014	0.014	0.014	0.058	0.030	0.046
National Horticultural Research and Development Foundation, Nashik, Varieties													
44	NHRDF Furasangi	0.000	0.000	0.000	0.000	0.000	0.107	0.036	0.030	0.026	0.045	0.020	0.024
45	NHRDF Red-4	0.000	0.000	0.000	0.000	0.000	0.062	0.045	0.066	0.071	0.020	0.000	0.024
46	NHRDF Red-3	0.000	0.000	0.000	0.000	0.000	0.000	0.142	0.030	0.050	0.041	0.018	0.026
47	NHRDF-L- 28	0.000	0.000	0.000	0.142	0.030	0.050	0.041	0.018	0.017	0.017	0.016	0.030
National Horticultural Research and Development Foundation, Nashik, Advanced varieties													
48	AFLR	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.062	0.045	0.019
49	AFDR	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.000	0.036	0.030	0.025
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check													
50	N-53	0.000	0.000	0.000	0.107	0.066	0.026	0.064	0.018	0.017	0.017	0.031	0.032

Table 5 : Performance of onion genotypes against purple blotch in the field during *rabi* 2024

S No.	Genotypes/ cultivars	Disease progress at weekly interval (%)											PDI	Disease reaction
		(2 nd)*	(3 rd)	(4 th)	(5 th)	(6 th)	(7 th)	(8 th)	(9 th)	(10 th)	(11 th)	(12 th)		
		09/01	16/01	23/01	30/02	06/02	13/02	20/02	27/02	06/03	13/03	20/03		
Indian Institute of Horticultural Research, Bengaluru, Improved varieties														
1	Arka bheem	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	5.0	7.5	10.0	10.0	R
2	Arka kalyan	0.0	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	7.5	7.5	7.5	R
Local cultivars, Karnataka														
3	Balichakra-t	0.0	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	7.5	15.0	15.0	MR
4	Bagdal Local	0.0	0.0	0.0	0.0	0.0	2.5	5.0	5.0	7.5	10.0	12.5	12.5	MR
5	Balichakra Local	0.0	0.0	0.0	2.5	2.5	5.0	7.5	7.5	10.0	12.5	15.0	15.0	MR
6	Parmankallur	0.0	2.5	5.0	5.0	7.5	10.0	15.0	17.5	17.5	22.5	27.5	27.5	MS
7	Telagi-R	0.0	0.0	2.5	5.0	7.5	10.0	12.5	15.0	20.0	22.5	25.0	25.0	MS
8	Telagi-W	0.0	2.5	5.0	7.5	10.0	15.0	17.5	22.5	25.0	25.0	27.5	27.5	MS
9	Ballari red	0.0	0.0	0.0	2.5	5.0	7.5	12.5	15.0	20.0	25.0	30.0	30.0	MS

Gujarat Agriculture University, Gujarath genotypes														
10	GWO-1	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	27.5	27.5	MS
11	GJRO-11	0.0	5.0	7.5	10.0	12.5	12.5	15.0	17.5	20.0	25.0	27.5	27.5	MS
12	GJWO-3	0.0	2.5	5.0	7.5	12.5	15.0	17.5	17.5	22.5	25.0	27.5	27.5	MS
Directorate of Onion and Garlic Research, Pune, Genotypes														
13	DOGR-1771	0.0	0.0	2.5	2.5	7.5	7.5	10.0	10.0	12.5	15.0	17.5	17.5	MR
14	DOGR-1760	0.0	0.0	0.0	2.5	2.5	5.0	5.0	7.5	7.5	7.5	10.0	10.0	R
15	DOGR-1761	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	7.5	7.5	10.0	10.0	R
16	DOGR-1773	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	12.5	15.0	15.0	MR
17	DOGR-1774	0.0	0.0	2.5	2.5	5.0	5.0	7.5	10.0	12.5	12.5	15.0	15.0	MR
18	DOGR-1772	0.0	0.0	2.5	5.0	5.0	7.5	10.0	12.5	12.5	15.0	17.5	17.5	MR
19	DOGR-1769	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	12.5	12.5	15.0	15.0	MR
20	DOGR-1768	0.0	0.0	2.5	2.5	5.0	5.0	7.5	7.5	10.0	12.5	17.5	17.5	MR
Directorate of Onion and Garlic Research, Pune, Bhima varieties														
21	Bhima shweta	0.0	2.5	5.0	10.0	12.5	15.0	17.5	20.0	22.5	25.5	27.5	27.5	MS
22	Bhima super	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	5.0	7.5	7.5	7.5	R
23	Bhima raj	0.0	0.0	2.5	5.0	5.0	7.5	7.5	10.0	10.0	12.5	15.0	15.0	MR
24	Bhima shakti	0.0	2.5	2.5	5.0	7.5	10.0	10.0	12.5	15.0	17.5	20.0	20.0	MS
25	Bhima light red	0.0	2.5	2.5	5.0	5.0	7.5	10.0	12.5	15.0	15.0	17.5	17.5	MR
26	Bhima dark red	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	7.5	7.5	10.0	10.0	R
27	Bhima kiran	0.0	0.0	2.5	2.5	5.0	5.0	7.5	10.0	12.5	15.0	17.5	17.5	MR
28	Bhima red	0.0	0.0	0.0	2.5	5.0	7.5	10.0	15.0	20.0	22.5	25.0	25.0	MS
29	Bhima safed	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	R
30	Bhima shubra	0.0	0.0	0.0	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	R
Directorate of Onion and Garlic Research, Pune, White onion genotypes														
31	W-364 GP	0.0	2.5	5.0	7.5	10.0	12.5	20.0	20.0	25.0	30.0	35.0	35.0	S
32	W-405	2.5	5.0	10.0	17.5	25.0	27.5	35.0	40.0	45.0	50.0	57.5	57.5	S
33	W-406	0.0	0.0	5.0	12.5	17.5	25.0	30.0	35.0	40.0	45.0	50.0	50.0	S
34	W-310-GP	0.0	2.5	7.5	12.5	17.5	25.0	30.0	32.5	35.0	37.5	42.5	42.5	S
35	W-344	0.0	2.5	7.5	17.5	25.0	32.5	37.5	42.5	45.0	47.5	50.0	50.0	S
36	W-355	0.0	5.0	7.5	12.5	17.5	20.0	30.0	35.0	45.0	47.5	55.0	55.0	S
37	W-361	0.0	2.5	7.5	15.0	22.5	27.5	35.0	40.0	42.5	45.0	50.0	50.0	S
38	W-504	0.0	2.5	5.0	17.5	25.0	32.5	37.5	42.5	45.0	47.5	55.0	55.0	S
39	W-448	0.0	5.0	7.5	15.0	20.0	27.5	32.5	42.5	45.0	47.5	50.0	50.0	S
40	W-125-GP	0.0	0.0	2.5	5.0	10.0	15.0	20.0	25.0	27.5	35.0	37.5	37.5	S
41	W-210-GP	0.0	0.0	0.0	2.5	5.0	10.0	17.5	25.0	30.0	35.0	42.5	42.5	S
42	W-203-GP	0.0	0.0	2.5	5.0	15.0	20.0	25.0	30.0	35.0	37.5	45.0	45.0	S
43	W-408	0.0	2.5	7.5	15.0	20.0	30.0	35.0	42.5	25.0	47.5	50.0	50.0	S
National Horticultural Research and Development Foundation, Nashik, Varieties														
44	NHRDF Furasangi	0.0	0.0	0.0	0.0	5.0	10.0	12.5	15.0	17.5	20.0	25.0	25.0	MS
45	NHRDF Red-4	0.0	0.0	0.0	2.5	5.0	7.5	10.0	15.0	20.0	25.0	27.5	27.5	MS
46	NHRDF Red-3	0.0	0.0	0.0	0.0	2.5	7.5	12.5	17.5	20.0	25.0	30.0	30.0	MS
47	NHRDF-L- 28	0.0	0.0	0.0	2.5	5.0	7.5	15.0	20.0	25.0	27.5	30.0	30.0	MS
National Horticultural Research and Development Foundation, Nashik, Advanced varieties														
48	AFLR	0.0	0.0	0.0	0.0	0.0	2.5	2.5	5.0	5.0	7.5	10.0	10.0	R
49	AFDR	0.0	0.0	0.0	2.5	5.0	7.5	7.5	10.0	10.0	12.5	17.5	17.5	MR
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check														
50	N-53	0.0	0.0	0.0	2.5	5.0	10.0	15.0	17.5	22.5	27.5	30.0	30.0	MS

* Figures in parentheses are standard meteorological week

Table 6 : Categorization of onion genotypes based on host reaction to purple blotch under *rabi* 2024–25

S. No.	Disease reaction	PDI	Genotypes/ cultivars
1	R	5-10	Arka bheem, Arka kalyan, DOGR-1760, DOGR-1761, Bhima super, Bhima dark red, Bhima safed, Bhima shubra, AFLR
2	MR	11-20	Balichakra-t, Bagdal Local, Balichakra Local, DOGR-1771, DOGR-1773, DOGR-1774, Bhima raj, Bhima light red, DOGR-1772, DOGR-1769, DOGR-1768, Bhima kiran, AFDR
3	MS	21-40	Parmankallur, Telagi-R, Telagi-W, Ballari red, GWO-1, GJRO-11, GJWO-3, Bhima red, Bhima shakti, Bhima Shweta, NHRDF Furasangi, NHRDF Red-4, NHRDF Red-3, NHRDF-L- 28, N-53
4	S	41-60	W-364 GP, W-405, W-406, W-310-GP, W-344, W-355, W-361, W-504, W-448, W-125-GP, W-210-GP, W-203-GP, W-408

Table 7 : Area under disease progress curve for different onion genotypes in field during *rabi* 2024

S No.	Genotypes/ cultivars	09/01	16/01	23/01	30/02	06/02	13/02	20/02	27/02	06/03	13/03	20/03	AUDPC value
Indian Institute of Horticultural Research, Bengaluru, Improved varieties													
1	Arka bheem	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	35.00	43.75	61.25	227.50
2	Arka kalyan	0.00	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	43.75	52.50	183.75
Local cultivars, Karnataka													
3	Balichakra-t	0.00	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	43.75	78.75	210.00
4	Bagdal Local	0.00	0.00	0.00	0.00	0.00	8.75	26.25	35.00	43.75	61.25	78.75	253.75
5	Balichakra Local	0.00	0.00	0.00	8.75	17.50	26.25	43.75	52.50	61.25	78.75	96.25	385.00
6	Parmankallur	0.00	8.75	26.25	35.00	43.75	61.25	87.50	113.75	122.50	140.00	175.00	813.75
7	Telagi-R	0.00	0.00	8.75	26.25	43.75	61.25	78.75	96.25	122.50	148.75	166.25	752.50
8	Telagi-W	0.00	8.75	26.25	43.75	61.25	87.50	113.75	140.00	166.25	175.00	183.75	1006.25
9	Ballari red	0.00	0.00	0.00	8.75	26.25	43.75	70.00	96.25	122.50	157.50	192.50	717.50
Gujarat Agriculture University, Gujarath genotypes													
10	GWO-1	0.00	8.75	26.25	43.75	61.25	78.75	96.25	113.75	131.25	148.75	175.00	883.75
11	GJRO-11	0.00	17.50	43.75	61.25	78.75	87.50	96.25	113.75	131.25	157.50	183.75	971.25
12	GJWO-3	0.00	8.75	26.25	43.75	70.00	96.25	113.75	122.50	140.00	166.25	183.75	971.25
Directorate of Onion and Garlic Research, Pune, Genotypes													
13	DOGR-1771	0.00	0.00	8.75	17.50	35.00	52.50	61.25	70.00	78.75	96.25	113.75	533.75
14	DOGR-1760	0.00	0.00	0.00	8.75	17.50	26.25	35.00	43.75	52.50	61.25	61.25	297.50
15	DOGR-1761	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	43.75	52.50	61.25	245.00
16	DOGR-1773	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	70.00	78.75	96.25	437.50
17	DOGR-1774	0.00	0.00	8.75	17.50	26.25	35.00	43.75	61.25	78.75	87.50	96.25	455.00
18	DOGR-1772	0.00	0.00	8.75	26.25	35.00	43.75	61.25	78.75	87.50	96.25	113.75	551.25
19	DOGR-1769	0.00	0.00	8.75	26.25	43.75	52.50	61.25	70.00	78.75	87.50	96.25	525.00
20	DOGR-1768	0.00	0.00	8.75	17.50	26.25	35.00	43.75	52.50	61.25	78.75	105.00	428.75
Directorate of Onion and Garlic Research, Pune, Bhima varieties													
21	Bhima shweta	0.00	8.75	26.25	52.50	78.75	96.25	113.75	131.25	148.75	168.00	185.50	1009.75
22	Bhima super	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	35.00	43.75	52.50	218.75
23	Bhima raj	0.00	0.00	8.75	26.25	35.00	43.75	52.50	61.25	70.00	78.75	96.25	472.50
24	Bhima shakti	0.00	8.75	17.50	26.25	43.75	61.25	70.00	78.75	96.25	113.75	131.25	647.50
25	Bhima light red	0.00	8.75	17.50	26.25	35.00	43.75	61.25	78.75	96.25	105.00	113.75	586.25
26	Bhima dark red	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	43.75	52.50	61.25	245.00
27	Bhima kiran	0.00	0.00	8.75	17.50	26.25	35.00	43.75	61.25	78.75	96.25	113.75	481.25
28	Bhima red	0.00	0.00	0.00	8.75	26.25	43.75	61.25	87.50	122.50	148.75	166.25	665.00
29	Bhima safed	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	192.50
30	Bhima shubra	0.00	0.00	0.00	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	192.50
Directorate of Onion and Garlic Research, Pune, White onion genotypes													
31	W-364 GP	0.00	8.75	26.25	43.75	61.25	78.75	113.75	140.00	157.50	192.50	227.50	1050.00
32	W-405	0.00	26.25	52.50	96.25	148.75	183.75	218.75	262.50	297.50	332.50	376.25	1995.00
33	W-406	0.00	0.00	17.50	61.25	105.00	148.75	192.50	227.50	262.50	297.50	332.50	1645.00
34	W-310-GP	0.00	8.75	35.00	70.00	105.00	148.75	192.50	218.75	236.25	253.75	280.00	1548.75
35	W-344	0.00	8.75	35.00	87.50	148.75	201.25	245.00	280.00	306.25	323.75	341.25	1977.50
36	W-355	0.00	17.50	43.75	70.00	105.00	131.25	175.00	227.50	280.00	323.75	358.75	1732.50
37	W-361	0.00	8.75	35.00	78.75	131.25	175.00	218.75	262.50	288.75	306.25	332.50	1837.50
38	W-504	0.00	8.75	26.25	78.75	148.75	201.25	245.00	280.00	306.25	323.75	358.75	1977.50

39	W-448	0.00	17.50	43.75	78.75	122.50	166.25	210.00	262.50	306.25	323.75	341.25	1872.50
40	W-125-GP	0.00	0.00	8.75	26.25	52.50	87.50	122.50	157.50	183.75	218.75	253.75	1111.25
41	W-210-GP	0.00	0.00	0.00	8.75	26.25	52.50	96.25	148.75	192.50	227.50	271.25	1023.75
42	W-203-GP	0.00	0.00	8.75	26.25	70.00	122.50	157.50	192.50	227.50	253.75	288.75	1347.50
43	W-408	0.00	8.75	35.00	78.75	122.50	175.00	227.50	271.25	306.25	323.75	341.25	1890
National Horticultural Research and Development Foundation, Nashik, Varieties													
44	NHRDF Furasangi	0.00	0.00	0.00	0.00	17.50	50.75	78.75	96.25	113.75	131.25	157.50	644.00
45	NHRDF Red-4	0.00	0.00	0.00	8.75	26.25	43.75	61.25	87.50	122.50	157.50	183.75	691.25
46	NHRDF Red-3	0.00	0.00	0.00	0.00	8.75	35.00	70.00	105.00	131.25	157.50	192.50	700.00
47	NHRDF-L- 28	0.00	0.00	0.00	8.75	26.25	43.75	78.75	122.50	157.50	183.75	201.25	822.50
National Horticultural Research and Development Foundation, Nashik, Advanced varieties													
48	AFLR	0.00	0.00	0.00	0.00	0.00	8.75	17.50	26.25	35.00	43.75	61.25	192.50
49	AFDR	0.00	0.00	0.00	8.75	26.25	43.75	52.50	61.25	70.00	78.75	105.00	446.25
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check													
50	N-53	0.00	0.00	0.00	8.75	26.25	52.50	87.50	113.75	140.00	175.00	201.25	805.00

Table 8 : Rate of disease development (r) among different onion genotypes against purple blotch in field during *rabi* 2024

S No.	Genotypes/ cultivars	09/01	16/01	23/01	30/02	06/02	13/02	20/02	27/02	06/03	13/03	20/03	r value
Indian Institute of Horticultural Research, Bengaluru, Improved varieties													
1	Arka bheem	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.062	0.045	0.019
2	Arka kalyan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.015
Local cultivars, Karnataka													
3	Balichakra-t	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.111	0.025
4	Bagdal Local	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.036	0.022
5	Balichakra Local	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.036	0.030	0.025
6	Parmankallur	0.000	0.000	0.103	0.000	0.062	0.045	0.066	0.026	0.000	0.045	0.038	0.035
7	Telagi-R	0.000	0.000	0.000	0.103	0.062	0.045	0.036	0.030	0.050	0.021	0.020	0.033
8	Telagi-W	0.000	0.000	0.103	0.062	0.045	0.066	0.026	0.045	0.020	0.000	0.018	0.035
9	Ballari red	0.000	0.000	0.000	0.000	0.103	0.062	0.081	0.030	0.050	0.041	0.036	0.037
Gujarat Agriculture University, Gujarath genotypes													
10	GWO-1	0.000	0.000	0.103	0.062	0.045	0.036	0.030	0.026	0.023	0.021	0.038	0.035
11	GJRO-11	0.000	0.000	0.062	0.045	0.036	0.000	0.030	0.026	0.023	0.041	0.018	0.026
12	GJWO-3	0.000	0.000	0.103	0.062	0.081	0.030	0.026	0.000	0.045	0.020	0.018	0.035
Directorate of Onion and Garlic Research, Pune, Genotypes													
13	DOGR-1771	0.000	0.000	0.000	0.000	0.164	0.000	0.045	0.000	0.036	0.030	0.026	0.027
14	DOGR-1760	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.000	0.045	0.019
15	DOGR-1761	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.019
16	DOGR-1773	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.000	0.036	0.030	0.025
17	DOGR-1774	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.036	0.000	0.030	0.025
18	DOGR-1772	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.036	0.000	0.030	0.026	0.027
19	DOGR-1769	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.000	0.036	0.000	0.030	0.025
20	DOGR-1768	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.036	0.056	0.027
Directorate of Onion and Garlic Research, Pune, Bhima varieties													
21	Bhima shweta	0.000	0.000	0.103	0.107	0.036	0.030	0.026	0.023	0.021	0.023	0.015	0.035
22	Bhima super	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.062	0.000	0.015
23	Bhima raj	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.000	0.036	0.030	0.025
24	Bhima shakti	0.000	0.000	0.000	0.103	0.062	0.045	0.000	0.036	0.030	0.026	0.023	0.030
25	Bhima light red	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.036	0.030	0.000	0.026	0.027
26	Bhima dark red	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.000	0.045	0.019
27	Bhima kiran	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.036	0.030	0.026	0.027
28	Bhima red	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.066	0.050	0.021	0.020	0.033
29	Bhima safed	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.019
30	Bhima shubra	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.019
Directorate of Onion and Garlic Research, Pune, White onion genotypes													
31	W-364 GP	0.000	0.000	0.103	0.062	0.045	0.036	0.080	0.000	0.041	0.036	0.033	0.039
32	W-405	0.000	0.103	0.107	0.092	0.064	0.018	0.050	0.030	0.029	0.029	0.043	0.051

33	W-406	0.000	0.000	0.000	0.142	0.056	0.064	0.036	0.033	0.030	0.029	0.029	0.038
34	W-310-GP	0.000	0.000	0.164	0.081	0.056	0.064	0.036	0.017	0.016	0.015	0.030	0.044
35	W-344	0.000	0.000	0.164	0.137	0.064	0.052	0.031	0.030	0.014	0.014	0.014	0.048
36	W-355	0.000	0.000	0.062	0.081	0.056	0.023	0.077	0.033	0.060	0.014	0.043	0.041
37	W-361	0.000	0.000	0.164	0.111	0.071	0.038	0.050	0.030	0.015	0.014	0.029	0.048
38	W-504	0.000	0.000	0.103	0.199	0.064	0.052	0.031	0.030	0.014	0.014	0.043	0.050
39	W-448	0.000	0.000	0.062	0.111	0.050	0.059	0.034	0.061	0.014	0.014	0.014	0.038
40	W-125-GP	0.000	0.000	0.000	0.103	0.107	0.066	0.050	0.041	0.018	0.050	0.015	0.041
41	W-210-GP	0.000	0.000	0.000	0.000	0.103	0.107	0.092	0.064	0.036	0.033	0.045	0.044
42	W-203-GP	0.000	0.000	0.000	0.103	0.173	0.050	0.041	0.036	0.033	0.015	0.044	0.045
43	W-408	0.000	0.000	0.164	0.111	0.050	0.077	0.033	0.045	0.014	0.014	0.014	0.048
National Horticultural Research and Development Foundation, Nashik, Varieties													
44	NHRDF Furasangi	0.000	0.000	0.000	0.000	0.000	0.122	0.036	0.030	0.026	0.023	0.041	0.025
45	NHRDF Red-4	0.000	0.000	0.000	0.000	0.103	0.062	0.045	0.066	0.050	0.041	0.018	0.035
46	NHRDF Red-3	0.000	0.000	0.000	0.000	0.000	0.164	0.081	0.056	0.023	0.041	0.036	0.037
47	NHRDF-L- 28	0.000	0.000	0.000	0.000	0.103	0.062	0.111	0.050	0.041	0.018	0.017	0.037
National Horticultural Research and Development Foundation, Nashik, Advanced varieties													
48	AFLR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.103	0.000	0.062	0.045	0.019
49	AFDR	0.000	0.000	0.000	0.000	0.103	0.062	0.000	0.045	0.000	0.036	0.056	0.027
National Horticultural Research and Development Foundation, Nashik, Widely cultivated check													
50	N-53	0.000	0.000	0.000	0.000	0.103	0.107	0.066	0.026	0.045	0.038	0.017	0.037



Arka kalyan (resistant genotype)



W-405 (highly susceptible genotype)



Experimental view

Plate 1 : Identification of resistance sources for purple blotch of onion in field conditions

Acknowledgement

The author sincerely acknowledges the support and facilities provided by the Department of Plant Pathology, University of Agricultural Sciences, Raichur. The author also extends gratitude to the Chairman and advisory committee members for their guidance throughout the investigation.

References

- Chethana, B. S., Girija, G. and Manjunath, B. (2011). Screening of genotypes and effect of fungicides against purple blotch of onion. *Intl. Sci. Nature*, **2** (2), 384-387.
- Cramer, C. S. (2000). Breeding and genetics of *Fusarium* basal rot resistance in onion. *Euphytica*, **115**, 159-166.
- Dar, A. A., Sharma, S., Mahajan, R., Mushtaq, M., Salathia, A., Ahamad, S. and Sharma, J. P. (2020). Overview of purple blotch disease and understanding its management through chemical, biological and genetic approaches. *J. Interl. Agri.*, **19**(12), 3013-3024.
- Gupta, R. P., Srivastava, K. J. and Pandey, U. B. (2017). Screening of onion genotypes for resistance to purple blotch caused by *Alternaria porri*. *Indian J. Horti.*, **74**(2), 256-262.
- Jadhav, V. G., Baviskar, P. P., Pathrikar, D. T. and Bhosale, G. V. (2022). Export performance of Onion in India. *Pharma Innov.*, **11**, 428-430.
- Kim, M. Y., Han, J. W., Dang, Q.L., Kim, J. C., Kim, H. and Choi, G. J. (2022). Characterization of *Alternaria porri* causing onion purple blotch and its antifungal compound magnolol identified from *Caryodaphnopsis baviensis*. *Plos one*, DOI: 10.1371/journal.pone.0262836.
- Kumar, S., Maurya, A., Sharma, A., and Singh, J. (2021). Reaction of onion (*Allium cepa* L.) genotypes against purple blotch disease caused by *Alternaria porri*. *Int. J. Cur. Microbiol. Appl. Sci.*, **10**(2): 187-196.
- Kushal, P. M. G., Amaresh Y. S., Patil, S. S. and Kavitha, K. (2015). Screening of onion genotypes against purple blotch caused by *Alternaria porri*. *Trends Biosci.*, **8** (16): 4374-4377.
- Mayee, C. D. and Datar, V. V. (1986). *Phytopathometry*, Marathwad Agricultural University, Parabhani, pp. 95.
- Muthaiah, K., Pitchaimuthu, Ajay, K. P., Sriram, S., Padmini, K. and Usharani, T.R. (2021). Identification of elite genotypes of onion against purple blotch disease. *J. Ento. Zoology Studies*, **9**(2), 966-970.
- Pathak, C. S., Singh, D. P., Deshpande, A. A. and Sridhar, T. S. (1986). Source of resistance to purple blotch in onion. *Veg. Sci.*, **13**(2), 300-303.
- Pavan, W., Fraisse, C. W., and Peres, N. A. (2020). Quantification of apparent infection rate and area under disease progress curve for plant disease epidemics. *Plant Pathol. J.*, **36**(1), 1-9.
- Wakchaure, G. C., Minhas, P. S., Kumar, S., Khapte, P. S., Rane, J. and Reddy, K. S. (2023). Bulb productivity and quality of monsoon onion (*Allium cepa* L.) as affected by transient waterlogging at different growth stages and its alleviation with plant growth regulators. *Agric. Water Manage.*, DOI: 10.1016/j.agwat.2023.108136.
- Wheeler, B. E. (1969). An introduction to plant diseases. John Willey and Sons, Ltd., U. K, pp. 301