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Status and distribution of purple blotch disease in onion growing districts of Karnataka

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A roving survey was undertaken during *Kharif* 2023and*rabi*2023-24to assess the status and distribution of purple blotch disease caused by *Alternaria porri* in major oniongrowing regions of Karnataka. Farmers' fields across fifteen districts*viz.,*Bagalkote, Belagavi, Ballari, Bidar, Chitradurga, Gadag, Haveri, Dharwad, Kalaburagi, Kolar, Koppal, Raichur, Tumkur, Vijayapura, and Yadgirwere systematically surveyed. Observations were recorded on disease severity along with associated parameters such as soil type, variety, crop stage, irrigation method and planting system. The disease severity was assessed in the field using the 0–5 scaleand the per cent disease index (PDI) was recorded.The PDI across surveyed regions ranged from 11.60 to 52.80 per cent during *Kharif* 2023and*Rabi*2023-24indicating substantial spatial and temporal variation in disease intensity. The maximum disease intensity was recorded in Raichur district, whereas the minimum was observed in Tumkur and Belagavi districts. The maximum disease severity was consistently observed in humid and irrigated regions particularly under flatbed planting and in fields planted with the susceptible variety Nasik Red.The variation in disease severity across agroclimatic zones highlights the significant influence of environmental factors, cultivation practices and varietal response on pathogen development. The study confirms that purple blotch remains a major constraint to onion productivity in Karnataka. The findings provide a baseline for developing regionspecific integrated disease management and predicting strategies to minimize losses and promote sustainable onion production.

Keywords : *Alternaria porri,* disease severity onion, purple blotch, roving survey

INTRODUCTION

Onion (*Allium cepa* L.)popularly known as the "Queen of kitchen" is regarded as the poor man's staple spice. It is one of the five most important fresh market vegetable crops grown worldwide belonging to the family Alliaceae (Cramer, 2000). The primary centre of origin lies in Central Asia, extensively cultivated across diverse agroclimatic regions and the major onion growing countries in the world are China, India, United States, Turkey, Iran, Egypt and Pakistan. Onion is growing throughout the year in different ecological conditions and consumed by almost all classes of people on account of its medicinal and dietary value.

It also exhibits a number of therapeutic properties such as antibacterial, antifungal, antihelmenthic, anti-inflammatory, antiseptic and antispasmodic etc. (Dar *et al.* 2020).

It also owns potent medicinal value in ayurvedic and homeopathic therapy. It is rich source of minerals, vitamins and dietary fibers. Allylpropyldisulphide is the main ingredient responsible for pungency in bulbs which helps to prevent cancer. Due to their enormous commercial and medicinal value, onion is

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cultivated in almost all countries of the world and consumed across the globe (Kim *et al.* 2022).

In India, the production of onion is 31.00 billion tones with an area of 1.79 billion ha, and in Karnataka, it occupies an area of 231.84 mha, production of 2.78 billion tones and productivity of 11.99 mt/ha (Anon, 2022). The major onion producing states in India are Maharashtra, Madhya Pradesh, Karnataka, Rajasthan and Gujarat. The maximum compound growth rate in onion export ofIndia to all countries was reduced in 2018-19 compared to 1996-97inquantity and value in Indian rupee (Jadhav *et al*. 2022).

Hence, in the present investigation various aspects on Purple blotch was undertaken during the period 2023 with reference to survey and surveillance of purple blotch disease in major onion growing areas of the northern Karnataka.

MATERIALS AND METHODS

A roving survey was conducted to know the status of the purple blotch in major onion growing regions of Karnataka *viz.,*Bagalkote, Belagavi, Ballari, Bidar, Chitradurga, Gadag, Haveri, Dharwad, Kalaburagi, Kolar, Koppal, Raichur, Tumkur, Vijayapura and Yadgiri districts (Fig.1). During the survey, the observation of disease severity was recorded by randomly selecting 25 onion plants per plot. Based on this observation the per cent disease index was calculated. Scoring of the disease was done in the field by using 0 - 5 scale given by Mayee and Datar (1986); Muthaiah*et al*. (2021); Chauhan *et al*. (2024). The per cent disease index (PDI) was calculated by using formula given by Wheeler (1969).

RESULTS AND DISCUSSION

The per cent disease severity (PDI) across all the surveyed regions ranged from 11.60 to 52.80 per cent. The minimum disease intensity was observed in Hosakere village (Madhugiri taluk, Tumakur district) with 11.60per cent while the maximum disease intensity was recorded in Raichur district, Raichur taluk and Signodi village (52.80 %) during *kharif* 2023and *rabi* 2023-24 (Table1). This variation in per cent disease severity indicates that the intensity of purple blotch is seriously influenced by regional agroclimatic conditions, crop management strategies and varietal response.

Among the districts surveyed, Dharwad exhibited the maximum mean PDI of 31.47 per cent followed by Raichur(30.40%) and Yadgir(28.40%). In contrast, Belagavi recorded 17.87 per cent and Tumakur 19.33 per cent showed comparatively minimum disease intensity during *kharif* 2023and *rabi* 2023-24. The overall district mean values highlight that northern dry zones and irrigated belts favoured maximum disease intensity compared to transitional zones.

In Raichur district, PDI values ranged from 23.20 to 52.80 per cent, with a mean diseaseintensity of 30.40 per cent. The maximum disease intensity was recorded in Singnodi village (52.80%) of Raichur taluk, where the variety Nasik red was grown under irrigated conditions. The minimum diseaseintensity was observed in Margatnal (23.20%) of Lingasugur taluk and Jutmardi (23.20%) of Devadurga taluk. Other locations such as Neeralkere village of Lingasugur taluk recorded comparatively maximum disease intensity (40.80%), while most rainfed areas exhibited moderate disease levels.In Ballari district, purple blotch intensity varied from 20.80 to 39.20 per cent, with an overall mean PDI of 26.84 per cent. The maximum disease intensity was observed at Sandur village (39.20%) of Sandur taluk, where Hybrid red (Ellora) was cultivated. In contrast, the minimum disease intensity was recorded at Bhujanganagar village (20.80%) of Sandur taluk. Villages under Siruguppa and Bellari taluks showed relatively uniform and moderate disease intensity, ranging between 24.80 and 27.20 per cent. In Yadgiri district, PDI values ranged from 25.60 to 32.00 per cent with a mean diseaseintensity of 28.40 per cent. The maximum disease intensity was recorded in Chamnal village (32.00%) of Shahapur taluk whereas the minimum diseaseintensity was observed at Mailapur village (25.60%) of Yadgiri taluk. Other villages in the district recorded moderate levels of purple blotch intensity under irrigated conditions.

In Kalaburagi district, PDI values ranged from 15.20 to 25.60per cent, with a mean diseaseintensity of 20.72per cent. In Kalaburagi

Disease rating scale adopted to score disease severity and to indicate resistance against purple blotch

Scale	Reaction	Disease severity (%)	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

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

taluk, the minimum disease intensity was recorded at Keribhosga village (15.20%) where Nifad selection (Panchganga) was cultivated under irrigated conditions while the maximum PDI was observed at Nagoora village (21.60%) under rainfed conditions with Hybrid red (Ellora). In Chitapur taluk, comparatively maximum disease pressure was noticed, with the maximum PDI recorded at Watwati village (25.60%) followed by Herur village (23.20%) both under rainfed conditions with Nasik red, whereas the minimum disease intensity in this taluk was observed at Shellagi village (20.80%). Similarly, in Aland taluk, where onion cultivation was predominantly under irrigated conditions purple blotch intensity ranged from 18.40 to 23.20 per cent with the minimum PDI at Kadaganchi village (18.20%) and the maximum at Telekuni village (23.20%) both grown with Nifad selection (Panchganga).

In Bidar district, the intensity of purple blotch disease varied from 18.40 to 29.60 per cent, with a mean PDI of 23.87 per cent. The maximum disease intensity was recorded at Kalwaadi village (29.60%) of Bhalki taluk, whereas the minimum disease intensity was observed at Wadankera village (18.40%) of Humnabad taluk. Among the surveyed locations, Talmadgi (26.40%) and Dhanura (27.20%) also recorded comparatively higher disease intensity. Most of the surveyed fields cultivated Nifad selection (Panchganga) under irrigated flat-bed conditions.In Koppal district, purple blotch intensity ranged between 20.80 and 29.60 per cent, with a mean PDI of 24.53 per cent. The maximum disease intensity was recorded at Katarki village (29.60%), while the minimum disease intensity was observed at Kidadhal village (20.80%) of Koppal taluk. Hiresindogi village recorded a disease intensity of 23.20 per cent. The surveyed onion fields were predominantly irrigated with cultivation practices involving both flat-bed and ridgesandfurrows methods.

In Belagavi district, comparatively minimum disease pressure was recorded, with PDI values ranging from 15.20 to 20.00 per cent and a mean disease intensity of 17.87 per cent. The maximum disease intensity occurred at Budigoppa village (20.00%), while the minimum disease intensity was observed in Yaragatti village (15.20%) of Savadatti taluk.In Dharwad district, purple blotch intensity varied from 18.40 to 52.00 per cent, with a mean PDI of 31.47 per cent. The maximum disease intensity was recorded at Amminabhavi village (52.00%) of Dharwad taluk, followed by Gabbur village (34.40%) of Hubballi taluk. The

Table 1 : Status of the intensity of purple blotch of onion in major onion growing regions of Karnataka *Kharif* 2023 and *rabi* 2023-24

District	Taluk	Village	Season	Variety	Soil type	Rainfed/Irrigated	Planting method	PDI
Raichur	Raichur	Singnodi	*Kharif*	Nasik red	Red	Irrigated	Flat	52.80
		Betadoor	*Kharif*	Local	Red	Irrigated	Flat	26.40
		Wadwati	*Kharif*	Local	Red	Rainfed	Flat	28.80
		Kurabdoddi	*Kharif*	Local	Red	Rainfed	Flat	25.60
		U.A.S campus	*Kharif*	Bellari red	Red	Rainfed	Flat	32.80
		Margatnal	*Kharif*	Bheema super	Red	Irrigated	Flat	23.20
	Lingasugur	Adavibhavi	*Kharif*	Local	Red	Irrigated	Flat	25.60
		Neeralkere	*Kharif*	Local	Red	Irrigated	Flat	40.80
		Malledevargud	*Kharif*	Nifad selection (Panchganga)	Red	Rainfed	Flat	25.60
	Devadurga	Jutmardi	*Kharif*	Local	Red	Rainfed	Flat	23.20
		Bendergankal	*Kharif*	Local	Red	Rainfed	Flat	29.60
				Mean				30.40
Ballari	Siruguppa	Hagalur	*Kharif*	Local	Red	Irrigated	Flat	24.80
		Sindegeri	*Kharif*	Local	Red	Irrigated	Flat	25.60
		Sanavasapura	*Kharif*	Local	Red	Irrigated	Flat	26.40
		Singadevanahalli	*Kharif*	Local	Red	Irrigated	Flat	25.60
	Bellari	Gopalapuram	*Kharif*	Local	Red	Irrigated	Flat	27.20
		Dammur	*Kharif*	Local	Red	Irrigated	Flat	25.60
	Sandur	Sandur	*Kharif*	Hybrid red (Ellora)	Red	Irrigated	Flat	39.20
		Krinanagar	*Kharif*	Hybrid red (Ellora)	Red	Irrigated	Flat	26.40
		Bhujanganagar	*Kharif*	Hybrid red (Ellora)	Red	Irrigated	Flat	20.80
				Mean				26.84
Yadgiri	Shahapur	Gundahalli	*Kharif*	Local	Black	Irrigated	Flat	29.60
		Khanapur	*Kharif*	Local	Black	Irrigated	Flat	28.80
	Yadgiri	Chamnal	*Kharif*	Hybrid red (Ellora)	Red	Irrigated	Flat	32.00
		Raisabadhosahalli	*Kharif*	Hybrid red (Ellora)	Black	Irrigated	Flat	27.20
		Mailapur	*Kharif*	Hybrid red (Ellora)	Black	Irrigated	Flat	25.60
		Nagalapur	*Kharif*	Hybrid red (Ellora)	Black	Irrigated	Flat	27.20
			Mean					**28.40**
Kalaburagi	Kalaburagi	Awrad (B)	*Kharif*	Hybrid red (Ellora)	Black	Irrigated	Flat	20.80
		Savalgi B	*Kharif*	Nifad selection (Panchganga)	Black	Rainfed	Flat	18.40
		Keribhosga	*Kharif*	Nifad selection (Panchganga)	Black	Irrigated	Flat	15.20
		Nagoora	*Kharif*	Hybrid red (Ellora)	Black	Rainfed	Flat	21.60
	Chitapur	Herur	*Rabi*	Nasik red	Black	Rainfed	Flat	23.20
		Shellagi	*Rabi*	Nasik red	Black	Rainfed	Flat	20.80
		Watwati	*Rabi*	Nasik red	Black	Rainfed	Flat	25.60
	Aland	Sunthnoor	*Rabi*	Nifad selection (Panchganga)	Black	Irrigated	Flat	20.00
		Telekuni	*Rabi*	Nifad selection (Panchganga)	Black	Irrigated	Flat	23.20
		Kadaganchi	*Rabi*	Nifad selection (Panchganga)	Black	Irrigated	Flat	18.40
			Mean					**20.72**
		Wadankera	*Rabi*	Nifad selection (Panchganga)	Red	Irrigated	Flat ...	18.40

	Humnabad	Kandgul	*Rabi*	Nifad selection (Panchganga)	Red	Irrigated	Flat	20.80
Bidar		Talmadgi	*Rabi*	Nifad selection (Panchganga)	Red	Irrigated	Flat	26.40
		Dhanura	*Rabi*	Nifad selection (Panchganga)	Black	Irrigated	Flat	27.20
	Bhalki	Kalwaadi	*Rabi*	Nifad selection (Panchganga)	Black	Irrigated	Flat	29.60
		Halahiparaga	*Rabi*	Local	Black	Irrigated	Flat	20.80
				Mean				**23.87**
		Kidadhal	*Rabi*	Local	Red	Irrigated	Ridges and furrows	20.80
Koppal	Koppal	Hiresindogi	*Rabi*	Local	Black	Irrigated	Ridges and furrows	23.20
		Katarki	*Rabi*	Local	Black	Irrigated	Flat	29.60
				Mean				**24.53**
		Halki	*Kharif*	Local	Black	Rainfed	Flat	18.40
Belagavi	Savadhatti	Budigoppa	*Kharif*	Local	Black	Rainfed	Flat	20.00
		Yaragatti	*Kharif*	Local	Black	Rainfed	Flat	15.20
				Mean				**17.87**
		U.A.S campus	*Rabi*	Bheema super	Black	Rainfed	Flat	33.60
	Dharwad	Marawad	*Rabi*	Bheema super	Black	Rainfed	Flat	23.20
Dharwad		Amminabhavi	*Rabi*	Nifad selection (Panchganga)	Black	Rainfed	Flat	52.00
		Bommapur	*Rabi*	Nifad selection (Panchganga)	Black	Rainfed	Flat	27.20
	Hubballi	Gabbur	*Rabi*	Nifad selection (Panchganga)	Black	Rainfed	Flat	34.40
		Kusugal	*Rabi*	Nifad selection (Panchganga)	Black	Rainfed	Flat	18.40
				Mean				**31.47**
		Jambagi A	*Kharif*	Nifad selection (Panchganga)	Black	Rainfed	Flat	21.60
	Vijayapura	Ankalagi	*Kharif*	Nifad selection (Panchganga)	Black	Rainfed	Flat	23.20
		Hittinahalli	*Kharif*	Nifad selection (Panchganga)	Black	Rainfed	Flat	16.80
		Mattinal	*Kharif*	Nifad selection (Panchganga)	Black	Rainfed	Flat	13.60
		Katakanahalli	*Kharif*	Hybrid red (Ellora)	Black	Rainfed	Flat	25.60
Vijayapura	Basavana Bagevadi	Yarnal	*Kharif*	Hybrid red (Ellora)	Black	Rainfed	Flat	48.80
		Shankarnagar	*Kharif*	Pusafursangi	Black	Rainfed	Flat	34.40
		Nagaradinni	*Kharif*	Pusafursangi	Black	Rainfed	Flat	23.20
	Kolhar	Mattinal	*Kharif*	Hybrid red (Ellora)	Black	Rainfed	Flat	28.80
		Kolhar	*Kharif*	Bheema super	Black	Rainfed	Flat	18.40
			Mean					**25.44**
		Arban	*Kharif*	Nasik red	Black	Rainfed	Flat	21.60
Gadag	Naragund	Kelakeri	*Kharif*	Nasik red	Black	Rainfed	Flat	22.40
		Naragund	*Kharif*	Nasik red	Black	Rainfed	Flat	33.60
			Mean					**25.87**
		Halageri	*Rabi*	Double red	Black	Rainfed	Flat	23.20
		Hanumanamatti	*Rabi*	Double red	Black	Rainfed	Flat	22.40
Haveri	Ranebennur	Devaragudda	*Rabi*	Local	Black	Rainfed	Flat	26.40
		Timmapur	*Rabi*	Double red	Black	Rainfed	Flat	24.80
			Mean					**24.20**
		Mamatageri	*Rabi*	Nasik red	Black	Rainfed	Flat	25.60
Bagalkote	Bagalkote	Tulsigeri	*Rabi*	Local	Black	Irrigated	Flat	20.80
		Govindkoppa	*Rabi*	Local	Black	Irrigated	Flat	23.20
				Mean				**23.20**

		Talaku	*Rabi*	Local	Black	Rainfed	Flat	23.20
Chitradurga	Challakere	Giriyapura	*Rabi*	Local	Black	Rainfed	Flat	28.80
		Rangenahalli	*Rabi*	Nasik red	Red	Irrigated	Flat	23.20
				Mean				**25.13**
		Hosakere	*Rabi*	Arkakalyan	Red	Irrigated	Flat	11.60
Tumakur	Madhugiri	Galihalli	*Rabi*	Local	Red	Irrigated	Flat	20.80
		Thippagondanahalli	*Rabi*	Local	Red	Irrigated	Flat	25.60
				Mean				**19.33**
		Gajalbavi	*Rabi*	Local	Red	Rainfed	Flat	20.80
Kolar	Mulbagal	Jangamahosahalli	*Rabi*	Local	Red	Irrigated	Flat	18.40
		Achampalli	*Rabi*	Local	Red	Irrigated	Flat	20.00
				Mean				**19.73**

minimum diseaseintensity was observed at Kusugal village (18.40%).

In Vijayapura district, PDI values ranged from 13.60 to 48.80 per cent, with an overall mean diseaseintensity of 25.44per cent. In Vijayapura taluk, disease intensity ranged from 16.80 to 23.20 per cent, with the minimum PDI recorded at Hittinahalli village (16.80%) and the maximum at Ankalagi village (23.20%), where Nifad selection (Panchganga) was cultivated under rainfed conditions. In BasavanaBagevadi taluk, the minimum disease intensity in the district (13.60%) was observed at Mattinal village with Nifad selection (Panchganga), whereas the maximum PDI (48.80%) was recorded at Yarnal village under Hybrid red (Ellora) followed by Shankarnagar village (34.40%) with Pusafursangi. In Kolhar taluk, purple blotch intensity ranged from 18.40 to 28.80 per cent with the minimum at Kolhar village (18.40%) under Bheema super and the maximum at Mattinal village (28.80%) with Hybrid red (Ellora).

In Gadag district, purple blotch intensity varied between 21.60 and 33.60 per cent, with a mean PDI of 25.87 per cent. The maximum disease intensity was recorded at Naragund village (33.60%), whereas the minimumdiseaseintensity was observed at Arban village (21.60%) of Naragund taluk.

In Haveri district, PDI values ranged from 22.40 to 26.40 per cent, with a mean intensity of 24.20 per cent. The maximum disease intensity was observed in Devaragudda village (26.40%) of Ranebennur taluk, while the minimum diseaseintensity was recorded at Hanumanamatti village (24.20%).In Bagalkote district, purple blotch intensity ranged from 20.80 to 25.60 per cent, recording a mean PDI of 23.20 per cent. The maximumdiseaseintensity was observed at Mamatageri village (25.60%) of Bagalkote taluk, whereas the minimum diseaseintensity was recorded at Tulsigeri village (20.80%).In Chitradurga district, disease intensity varied from 23.20 to 28.80 per cent, with a mean diseaseintensity of 25.13 per cent. The maximum diseaseintensity was recorded at Giriyapura village (28.80%) of Challakere taluk, while the minimum diseaseintensity was observed at Rangenahalli village (23.20%).In Tumakur district, comparatively minimum disease intensity was recorded, with PDI values ranging from 11.60 to 25.60 per cent and a mean diseaseintensity of 19.73 per cent. The maximumdiseaseintensity was observed at Thippagondanahalli village (25.60%), whereas the minimumdiseaseintensity was recorded at Hosakere village (11.60%) of Madhugiri taluk.

In Kolar district, the intensity of purple blotch ranged from 18.40 to 20.80 per cent with a mean PDI of 19.73 per cent. The maximum disease intensity was recorded at Gajalbavi village (20.80%) of Mulbagal taluk, whereas the minimum disease intensity was observed at Jangamah-osahalli village (18.40%). Achampalli village recorded a disease intensity of 20.00 per cent.

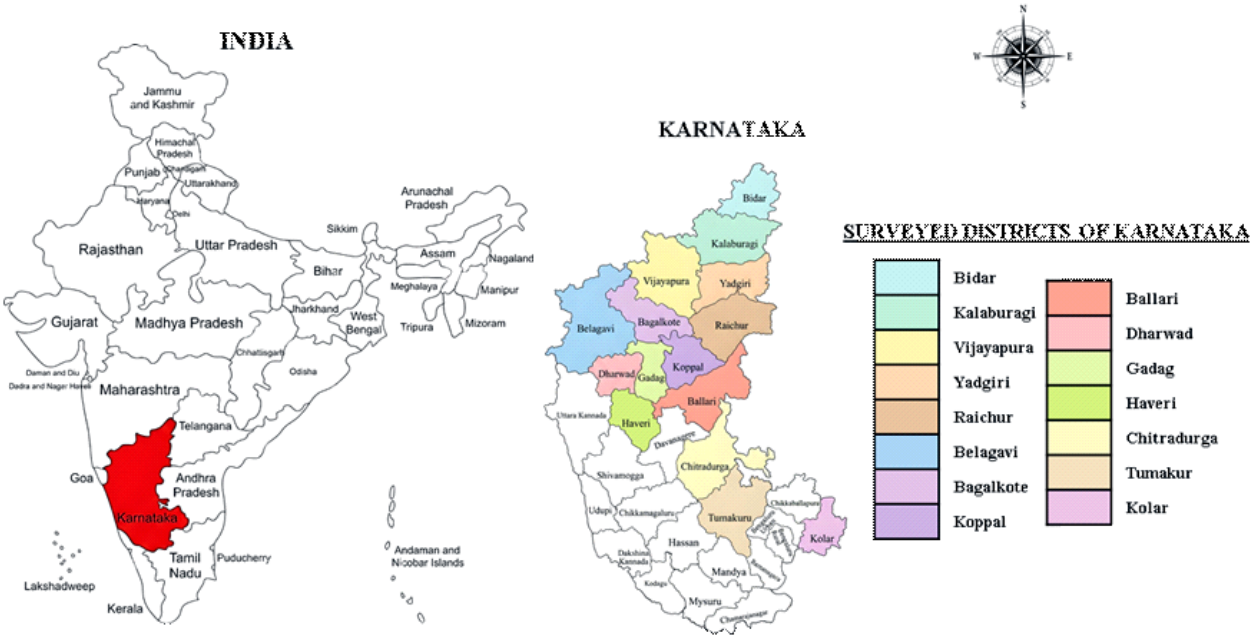

Fig.1: Spatial representation of surveyed districts for assessment of purple blotch intensity in major onion growing regions of Karnataka *Kharif* 2023 and *rabi*2023-24

Purple blotch PDI varied depending on the type of onion cultivars. The local variety and Nasik Red variety recorded maximum disease intensity levels. Similarly, Local susceptible varieties and Nasik Red exhibited maximum level of PDI values (>40%) whereas Bellary Red and improved lines such as Arka Kalyan, Arka Bheema and Bhima Super showed moderate to maximum levels of resistance with PDI values ranging from 5–10 per cent(Ravichandran *et al.* 2017). The disease intensity was more pronounced at physiological maturity crop stage coincided with canopy closure and favourable microclimatic conditions for disease development.Cultivar susceptibility played a decisive role in disease distribution.

Fields with red soils showed relatively maximum disease intensity compared to black soils possibly due to differences in soil moisture retention. Irrigated conditions favoured maximum level of disease intensity (mean PDI >30%) compared to rainfed conditions where diseaseintensity remained relatively moderate to minimum. Continuous soil moisture under irrigated conditions might have created a favorable environment for conidial germination and disease progression. Flat bed planting exhibited maximum level of PDI compared to ridge planting suggesting that better drainage and aeration in ridge planting suppress the disease to some extent. This supports earlier reports that field microclimate plays a critical role in purple blotch disease development (Angadi*et al.* 2018). The observed variation in disease intensity among districts can be attributed to differences in microclimate, varietal susceptibility and irrigation practices. Disease development was severe in fields with continuous irrigation, possibly due to sustained leaf wetness and high relative humidity which promote conidial germination and infection. In contrast, fields under rainfed conditions exhibited relatively moderate to minimum disease intensity (mean PDI <25%) likely due to intermittent moisture and limited canopy humidity. Similarly, fields established on flat beds showed maximum level of diseaseintensity than those under ridge and furrow planting supporting the idea that improved drainage and aeration reduce microclimatic humidity conducive to infection(Ravichandran *et al.* 2017).

Soil type also influenced disease dynamics. Fields with red soils known for better drainage but higher surface humidity under irrigation recorded maximum diseaseintensity than black soils where moisture retention was more consistent but surface evaporation limited spore survival. These findings align with the reports of Pandey *et al.*

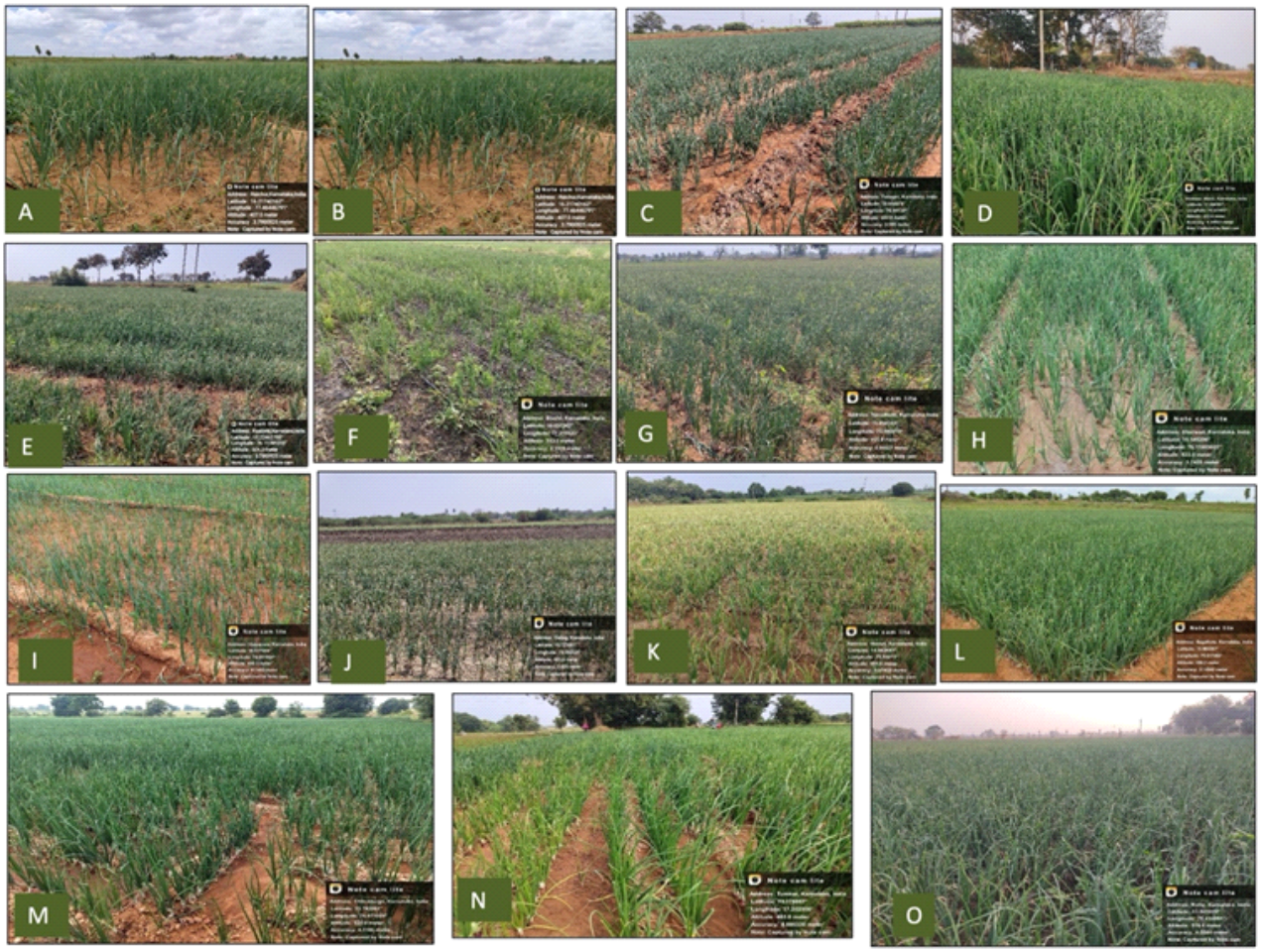

Fig. 2: Status of the intensity of purple blotch of onion in major onion growing districts of Karnataka *Kharif* 2023 and *rabi* 2023-24. A- Raichur; B-Ballari C-Yadgiri;D- Kalaburagi; E- Bidar;F-; Koppal; G- Belagavi; H-Dharwad; I- Vijiyapura; J- Gadag; K- Haveri; L- Bagalkote;M- Chitradurga district; N- Tumakur: O- Kolar

(2020) and Sharma *et al.* (2021) who observed that soil moisture gradients significantly modulate foliar disease microenvironments.

The survey results clearly indicated that purple blotch disease is widely prevalent throughout Karnataka though its disease intensitydiffered significantly across the districts, taluks and villages. The maximum disease intensity in Raichur, Dharwad and Yadgiri districts can be attributed to irrigated conditions, conducive weather and cultivation of susceptible varieties. On the other hand, districts like Belagavi, Haveri and Tumakuru with relatively minimum level of disease intensity may benefit from less favourable environmental circumstances for the pathogen or adoption of tolerant varieties (Vijaykumar *et al.* 2022).

The observed range of disease intensity aligns with earlier findings that purple blotch intensityis heavily reliant on crop growth stage, cultivars and weather factors such as relative humidity and temperature. The survey also underlines the role of planting method and irrigation in disease management. Thus, integrated management practices including varietal resistance, crop rotation and appropriate cultural practices are essential to minimize purple blotch intensity in onion growing regions of Karnataka (Pawar*et al.* 2023; Singh *et al.*2024;Hariprasad and Palakshappa, 2021).

Collectively, these findings indicate that the distribution and severity of purple blotch disease in onion are strongly governed by interactions among regional climatic factors, soil type, crop establishment methods and varietal susceptibility. Fig. 2 provides a of the intensity of purple blotch of onion in major onion growing regions of Karnataka *Kharif* 2023 and *Rabi* during 2023-24. The consistently maximum disease intensity

observed in humid and irrigated regions underscores the need for integrated disease management strategies including the selection of resistant cultivars, improved drainage, crop rotation and regionspecific fungicidal applications. Tailoring these strategies to the distinct agroecological zones of Karnataka will be crucial for minimizing disease impact and enhancing sustainable onion production.

CONCLUSION

The present investigation clearly revealed that purple blotch disease caused by *Alternaria porri* is widely prevalent across all major oniongrowing districts of Karnataka exhibiting considerable spatial and temporal variation in disease severity during *Kharif* 2023and *Rabi* 2023-24. The per cent disease index (PDI) varied markedly among districts and villages ranging from 11.55 to 52.80 per cent during*Kharif* 2023and *Rabi* 2023-24 highlighting the extensive distribution and economic importance of the pathogen. The maximumper cent disease severity was consistently recorded in Dharwad and Raichur districts whereas comparatively minimumper cent disease severity was observed in Belagavi and Tumkur districts.

The observed variation in disease severity across locations could be attributed to differences in agroclimatic conditions, soil type, irrigation methods, crop management practices and varietal susceptibility. Areas characterized by humid and irrigated environments showed maximumper cent disease severity emphasizing the role of prolonged leaf wetness and favourable microclimatic conditions in promoting infection and pathogen spread. Similarly, flatbed planting and cultivation of susceptible varieties such as Nasik Red were found to enhance disease severity, whereas ridge planting and tolerant cultivars like Bellary Red showed relatively reduced infection levels.

The findings corroborate earlier reports that purple blotch continues to remain a major constraint to onion productivity in Karnataka. The persistence of the pathogen across multiple agroecological zones suggests that environmental conditions across the state are conducive for its survival and dissemination. Therefore, integrated management strategies that combine the use of resistant varieties, appropriate planting methods, efficient irrigation scheduling and timely fungicidal interventions are essential for minimizing disease impact.

Overall, this survey provides a comprehensive understanding of the current status and distribution pattern of purple blotch disease in Karnataka and serves as a valuable baseline for designing regionspecific disease predicting and management programs aimed at sustaining onion productivity and profitability in Karnataka.

DECLARATION

Conflict of Interest. Authors declare no conflict of interest.

REFERENCES

Angadi, P., Aswathanarayana, D. S, Amaresh Y. S, Mallesh, S. B., Ramesh G., Savitha, A, S., Ajithkumar, K.2018. Survey for severity of purple blotch and screening of onion varieties against Purple Blotch Disease Caused by *Alternaria porri* in North Eastern Karnataka. *J. Farm.* **31**: 79-83.

Chauhan, S. S.A., Islam, S., Prasad, L., Singh, S., Ellur, R. K., Tomar, B. S. 2023. Screening of onion (*Allium cepa*) genotypes to find out novel resistant source against purple blotch (*Alternaria porri*). *The Indian J. Agri. Sci.* **93**: 1208-1213.

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. Integr. Agri.* **19**: 3013-3024.

Hariprasad, K., Palakshappa, M. G. 2021. Survey for the severity of purple blotch of onion in major onion growing districts of Karnataka. *Pharma Innov.* **10**: 100–102.

Jadhav, V. G., Baviskar, P. P., Pathrikar, D. T., 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 *Caryodaphnopsisbaviensis*. *Plos One* 17: https://doi.org/10.1371/journal.pone.0262836.

Mayee, C. D., Datar, V. V. 1986.*Phytopathometry*, Marathwad Agricultural University, Parabhani, pp. 95.

Muthaiah, K., Pitchaimuthu, Ajay, K.P., Sriram, S., Padmini, K., Usharani, T, R. 2021. Identification of elite genotypes of onion against purple blotch disease. *J. Ento. Zool. Stud.***9**: 966-970.

Pandey, R. N., Sharma, D., Singh, S. 2020. Soil moisture and canopy humidity influence on foliar blight diseases of onion. *Veg. Sci.***47**: 33–38.

Ravichandran, S., Kamanna B. C., Jayalakshmi, K., Benagi, V. I., Yadahalli, K. B. 2017. Severity of purple blotch of onion

caused by *Alternaria porri* in North Karnataka, India, *Int. J. Curr. Microbiol. App.* **6**: 3634-3638.

Sharma, R., Patel, R. L.,Chaudhari, S. M. 2021. Impact of soil and environmental factors on purple blotch disease of onion. *J. AgriSearch***8**: 142–149.

Vijaykumar, K. N., Kulkarni, S., Patil, P. V., Shashidhar, T. R., Kambrekar, D. N. 2022. Severity and distribution of purple blotch in major garlic growing areas of northern Karnataka. *J. Farm Sci.***35**:228-237.

Wheeler, B. E. 1969. An introduction to plant diseases. John Willey and Sons, Ltd., U. K, pp. 301