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# Survey of Purple Blotch Disease in Onion growing Districts of Bihar

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## ABSTRACT

Onion (*Allium cepa* L.) is one of the most important commercial vegetable crops grown in India. In view of the destructive nature of purple blotch of onion the present investigation was conducted in different districts of Bihar during *Kharif* and *Rabi*2018-2019.The highest disease incidence (37.17%) and intensity (38.95 %) was noticed in field of Pariaunna village of Nalanda district during *Rabi* season whereas highest disease incidence (21.24%) was recorded in field of village Kushahar and highest intensity (28.30 %) was noticed in field of village Paharpur district Vaishali during *kharif* season. While, the lowest disease incidence (17.62 % )and (21.25%) intensity was recorded in Azampur village of Vaishali district during *rabi* season, but in *kharif* season lowest (8.74%) disease incidence and (10.85%) intensity was observed in village Basaria district Samatipur . Among the districts, severity of disease more in Nalanda (36.64%) and less in Vaishali (26.78%) were recorded during *rabi* season, while less disease intensity (14.41%) in Samastipur district recorded in *kharif* season with highest value 26.21 % in Begusarai district.

*KEYWORDS*

Onion, purple blotch, *alternaria* blight, intensity, PDI and pathogencity

## INTRODUCTION

Onion (*Allium cepa* L.) is one of the major bulb crops of India. It accounts for 90 % of the exported vegetables from India in terms of value. In India onion occupied an area of about 1.22 million ha with a production of 20.99 million tones and productivity of 21.2 tons per ha during the year 2016-17. The major onion growing states are Maharashtra (30%), Madhya Pradesh (15%), Karnataka (11%), Gujarat (10%), Bihar (7%), Andhra Pradesh (5%), Rajasthan(4%),Haryana(3%)and others (15%), (Indian Horticulture Database, 2015). The productivity is still quit low as compared to other countries (Anonymous, 2015). Several factors have been identified for the low productivity of onion in India as well as in Bihar. The most important factors responsible are the insect pest and diseases like purple blotch, Downey mildew, stem phylium blight, basal rot, storage rot, thrips and non-availability of resistant varieties to biotic and abiotic stresses.

Among the foliar diseases, purple blotch is one of the most destructive diseases, commonly prevailing in almost all onion growing pockets of the world, which causes heavy loss in onions under field conditions. A loss ranges from 30 to 80 percent. The disease may reach epidemic states during the favorable conditions of high relative humidity (80-90%) and optimum temperature (24±10C) (Yadav *et al.*,2013).For the first time the purple blotch of onion caused by *Alternaria cepulae* was observed by Ponnappa (1970) in Karnataka. The name "Purple blotch" for this disease was proposed by Nolla (1927). He named the causal organism as *Alternaria* which was later amended to *Alternaria porri*. The pathogen *Alternaria porri* destructs the leaf tissue which destroys the stimulus for bulb initiation and delays bulb

**Table 1:** District wise Area and Production of onion in Bihar during2017-2018

| District | Area (ha.) | Production (MT) |
|---|---|---|
| Araria | 1503 | 32314.5 |
| Arwal | 400 | 9900 |
| Aurangabad | 875 | 19911 |
| Banka | 710 | 15721.43 |
| Begusarai* | 1800 | 38160 |
| Bhagalpur | 1605 | 40156.15 |
| Bhojpur* | 1200 | 26000 |
| Buxar* | 800 | 20009.6 |
| Darbhanga | 1000 | 25000 |
| Gaya | 1405 | 28000 |
| Gopalganj | 750 | 18600 |
| Jamui | 809 | 21274.08 |
| Jehanabad | 516 | 13519 |
| Kaimur (Bhabua) | 1012 | 20948.4 |
| Katihar | 2931 | 62437 |
| Khagaria | 804 | 17386.5 |
| Kishanganj | 1411 | 31646.71 |
| Lakhisarai | 350 | 8836 |
| Madhepura | 750 | 16950 |
| Madhubani | 1000 | 22000 |
| Munger | 1100 | 26903 |
| Muzaffarpur | 2690 | 62320 |
| Nalanda* | 5970 | 159200 |
| Nawada | 1040 | 22450 |
| Pashchim Champaran | 3000 | 77402 |
| Patna | 2980 | 72207 |
| Eastern Champaran* | 2320 | 57304 |
| Purnia | 1801 | 42500 |
| Rohtas | 1269.45 | 28879.99 |
| Saharsa | 618 | 15380 |
| Samastipur* | 1400 | 30460 |
| Saran | 1014 | 18252 |
| Sheikhpura | 1312 | 29065 |
| Sheohar | 702 | 17350 |
| Sitamarhi | 1303 | 32575 |
| Siwan | 950 | 22167 |
| Supaul | 420 | 8946 |
| Vaishali* | 2252.5 | 55051.1 |
| Total | 53772.95 | 1267182.46 |

*These districts under survey for purple blotch disease of onion crop in both sessions

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formation and maturation. Severe attack on flowering alliums can completely girdle flower stalks with necrotic tissue, causing their collapse and total loss of seed production capacity. Survey and surveillance form the basis for any successful plant protection strategy. Successful plant protection depends upon early detection of the disease severity followed by timely adoption and application of preventive measures (Rao, 1975). However, systemic survey on the distribution and severity in Bihar is lacking. There is a need to undertake systemic survey to identify hotspots for the disease in 7 districts of Bihar (Table 1). Keeping all these aspects in view, the present investigation was undertaken to know the disease severity in Bihar.

## MATERIALS AND METHODS

A roving survey was conducted to know the disease incidence % with intensity % of purple blotch disease in selected districts of Bihar during *Kharif* and *Rabi* seasons on *2018-19*when the crop was at 60 to 75 days after transplanting of crops. The survey was carried out from *kharif* and *rabi* major onion growing districts *viz.*, Samastipur, Nalanda, Vaishali, Buxar, Bhojpur, Eastern Champaran and Begusarai districts. The temperature and relative humidity data collected during cropping period. The onion was mostly cultivated in raised bed in Kharif and flat bed in *Rabi* season in Bihar with irrigated conditions. The purple blotch severity was scored by following 0-5 scale as given by Sharma (1986). The details of scales are as shown below.

1. No disease symptoms.
2. A few spots towards tip covering 10 percent leaf area.
3. Several dark purplish brown patch covering up to 20 percent leaf area.
4. Several patches with paler outer zone covering up to 40 percent leaf area.
5. Leaf streaks covering up to 75 percent leaf area or breaking of the leaves from center.
6. Complete drying of the leaves or breaking of the leaves from center.

Further, disease incidence percent (DI %) and disease intensity was worked out by using following formula proposed by Wheeler (1969).

$$(1)\quad \text{Disease Incidence \%} = \frac{\text{Total number of plant infected/ Diseased}}{\text{Total no. of plant observed}} \times 100$$

$$(2)\quad \text{Disease Intensity} = \frac{\text{Total sum of all ratings} \times 100}{\text{Total no. of leaves observed x Maximum number of rating}}$$

## RESULTS AND DISCUSSION

The systematic survey was conducted in 63 onion growing villages of 7 districts of Bihar state during *kharif* and *rabi* season of 2018-19, where almost Technology Dissemination Through Demonstrations (TDTD) were running under Mission for Integrated Development of Horticulture programme (MIDH) to gather information on the symptomatology, severity, distribution and spread of purple blotch on onion in from different localities (Fig. 1).


**Fig. 1 :** Bihar map showing district wise incidence and intensity of purple blotch on onion

The severity of disease was also dependent on inoculums load, environmental conditions prevailing in different localities. The incidence and intensity was observed more during high humidity conditions and varies depends on temperature and relative humidity (Table 2).

**Table 2:** District wise temperature and relative humidity during cropping period

| District | Whether | Range | Jun-18 | Jul-18 | Aug -18 | Sep. -18 | Oct. -18 | Nov. -18 | Dec -18 | Jan -19 | Feb-20 | Mar- 20 | Apr-20 | May-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Samastipur | Temp. | Max. | 42 | 41 | 37 | 36 | 36 | 33 | 27 | 26 | 31 | 37 | 42 | 44 |
| | | Min | 25 | 25 | 25 | 25 | 18 | 13 | 06 | 07 | 09 | 10 | 21 | 23 |
| | | Av. | 33 | 31 | 30 | 30 | 27 | 22 | 16 | 16 | 19 | 25 | 30 | 34 |
| | R.H% | Max. | 89 | 98 | 98 | 98 | 97 | 96 | 98 | 100 | 100 | 96 | 100 | 94 |
| | | Min | 28 | 40 | 57 | 52 | 38 | 34 | 30 | 32 | 27 | 19 | 10 | 07 |
| | | Av. | 63 | 75 | 84 | 82 | 73 | 71 | 72 | 74 | 70 | 53 | 55 | 47 |
| Nalanda | Temp. | Max. | 42 | 41 | 37 | 36 | 36 | 33 | 27 | 26 | 31 | 37 | 42 | 44 |
| | | Min | 25 | 25 | 25 | 25 | 18 | 13 | 06 | 07 | 09 | 10 | 21 | 23 |
| | | Av. | 33 | 31 | 30 | 30 | 27 | 22 | 16 | 16 | 19 | 25 | 30 | 34 |
| | R.H% | Max. | 89 | 98 | 98 | 98 | 97 | 96 | 98 | **100** | **100** | **96** | **100** | **94** |
| | | Min | 28 | 40 | 57 | 52 | 38 | 34 | 30 | 32 | 27 | 19 | 10 | 07 |
| | | Av. | 63 | 75 | 84 | 82 | 73 | 71 | 72 | 74 | 70 | 53 | 55 | 47 |
| Vaishali | Temp. | Max. | 49 | 41 | 37 | 37 | 35 | 33 | 27 | 26 | 30 | 38 | 42 | 44 |
| | | Min | 25 | 25 | 25 | 25 | 18 | 12 | 05 | 06 | 08 | 10 | 20 | 23 |
| | | Av. | 33 | 31 | 30 | 30 | 27 | 22 | 16 | 16 | 19 | 24 | 30 | 34 |
| | R.H% | Max. | 94 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 94 | 94 |
| | | Min | 21 | 40 | 56 | 44 | 32 | 26 | 25 | 25 | 19 | 16 | 07 | 07 |
| | | Av. | 64 | 75 | 83 | 81 | 73 | 68 | 67 | 70 | 67 | 50 | 53 | 45 |
| Buxar | Temp. | Max. | 43 | 41 | 38 | 37 | 37 | 34 | 26 | 26 | 29 | 37 | 42 | 44 |
| | | Min | 24 | 25 | 24 | 22 | 17 | 12 | 05 | 06 | 09 | 09 | 17 | 23 |
| | | Av. | 34 | 31 | 29 | 29 | 27 | 21 | 15 | 15 | 17 | 23 | 30 | 33 |
| | R.H% | Max. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 94 | 70 |
| | | Min | 25 | 35 | 56 | 42 | 27 | 28 | 25 | 22 | 28 | 18 | 08 | 08 |
| | | Av. | 59 | 77 | 87 | 79 | 65 | 66 | 65 | 71 | 73 | 53 | 42 | 31 |
| Bhojpur | Temp. | Max. | 49 | 41 | 37 | 37 | 35 | 33 | 27 | 26 | 30 | 38 | 42 | 44 |
| | | Min | 25 | 25 | 25 | 25 | 18 | 12 | 05 | 06 | 08 | 10 | 20 | 23 |
| | | Av. | 33 | 31 | 30 | 30 | 27 | 22 | 16 | 16 | 19 | 24 | 30 | 34 |
| | R.H% | Max. | 94 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 94 | 94 |
| | | Min | 21 | 40 | 56 | 44 | 32 | 26 | 25 | 25 | 19 | 16 | 07 | 07 |
| | | Av. | 64 | 76 | 83 | 81 | 73 | 68 | 67 | 70 | 67 | 50 | 53 | 45 |
| Eastern Champaran | Temp. | Max. | 42 | 41 | 37 | 36 | 36 | 33 | 27 | 26 | 31 | 37 | 42 | 44 |
| | | Min | 25 | 25 | 25 | 25 | 18 | 13 | 06 | 07 | 09 | 10 | 21 | 23 |
| | | Av. | 33 | 31 | 30 | 30 | 27 | 22 | 16 | 16 | 19 | 25 | 30 | 34 |
| | R.H% | Max. | 89 | 98 | 98 | 98 | 97 | 96 | 98 | 100 | 100 | 96 | 100 | 94 |
| | | Min | 28 | 40 | 57 | 52 | 38 | 34 | 30 | 32 | 27 | 19 | 10 | 07 |
| | | Av. | 63 | 75 | 84 | 82 | 73 | 71 | 72 | 74 | 70 | 53 | 55 | 47 |
| Begusarai | Temp. | Max. | 42 | 41 | 37 | 36 | 36 | 33 | 27 | 26 | 31 | 37 | 42 | 44 |
| | | Min | 25 | 25 | 25 | 25 | 18 | 13 | 06 | 07 | 09 | 10 | 21 | 23 |
| | | Av. | 33 | 31 | 30 | 30 | 27 | 22 | 16 | 16 | 19 | 25 | 30 | 34 |
| | R.H% | Max. | 89 | 98 | 98 | 98 | 97 | 96 | 98 | 100 | 100 | 96 | 100 | 94 |
| | | Min | 28 | 40 | 57 | 52 | 38 | 34 | 30 | 32 | 27 | 19 | 10 | 07 |
| | | Av. | 63 | 75 | 84 | 82 | 73 | 71 | 72 | 74 | 70 | 53 | 55 | 47 |

The yield loss of onion in India due to purple blotch disease under favorable conditions varies from 25-50% (Pandotra, 1964) more so in Karnataka. It is revealed that the severity of disease varies from locality to locality (Table 3). The developments of the initial symptoms start from tip of the leaves particularly on older leaves to younger leaves. Infected leaves showed small, whitish, sunken, oval shaped lesions to elliptical. The lesion was brown to purple at the centre. Concentric light and dark zones are also noticed on the infected leaves. Change in leaves was started from centre of the lesion which extended above and below the lesion further the lesion coalesce and spread rapidly on leaf blade and infected leaves showed drying.

The disease was prevalent at all the locations surveyed and the purple blotch disease incidence and intensity varies from maximum (37.17%) and (38.95% )respectively in Pariaunna village of Nalanda district to minimum incidence (17.62%)and intensity (21.25%) in Azampur village of Vaishali district during rabi season, whereas in kharif its varies from maximum (21.25 %) and (28.76% respectively in Rashidpur village of Begusarai district to minimum (8.74%) and 10.85% in Basaria village of Samastipur districts respectively.

Among the districts the purple blotch disease incidence and intensity varies from maximum (34.42%) and (36.64%) respectively in Nalanda district to minimum (23.98 %) and

(26.78 %) in Vaishali district during *Rabi* season, whereas in *kharif* it varies from maximum (19.84 %) and (26.21%) respectively in Begusarai district to minimum (11.62 %) and (14.41 %) in Samastipur district (Fig. 2).

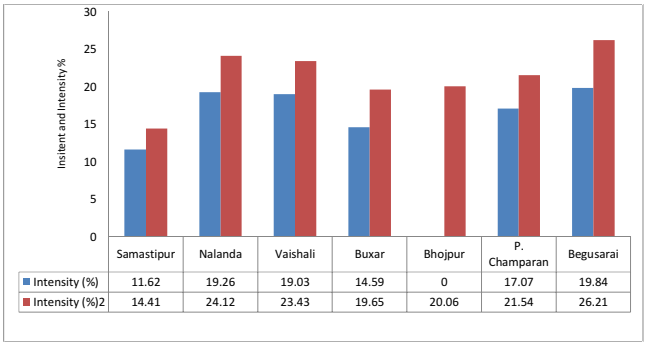


**Fig. 2:** District wise disease Insistent and Intensity (%) of Onion in *Kharif* 2018-19

The highest district average disease incidence and intensity was recorded in Nalanda district followed by Begusarai (31.11%) and (36.48%), Eastern Champaran (30.78%) and (35.96%) and lowest disease incidence and intensity (23.98%) and (26.78%) was recorded in Vaishali district respectively during *rabi* season (Fig 3).

While in *Kharif* season low disease incidence and intensity

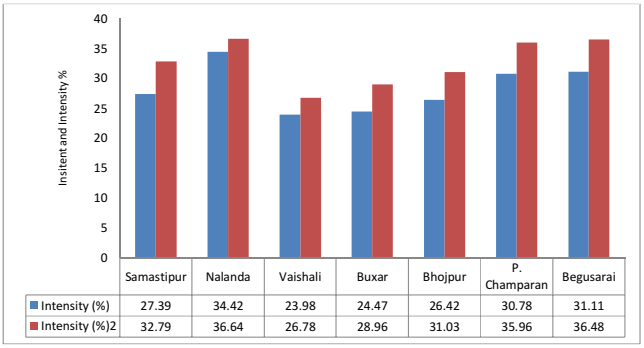


**Fig. 3:** District wise disease Insistent and Intensity (%) of Onion in *Rabi* 2018-19

was recorded in Bihar state in comparison to *rabi* season. In *kharif* season highest district average disease incidence and intensity was recorded in Begusarai (19.84%) and (26.21%) district followed by Nalanda (19.26%) and (24.12%), Vaishali (19.03%) and (23.43%) and lowest disease incidence and intensity (11.62%) and (14.41%) was recorded in Samastipur district respectively. The purple blotch disease of onion was severe in Nalanda district compare to Vaishali district in *rabi* season whereas more severity noticed in Begusarai district with compare to Samastipur in kharif season, while in Begusarai district more severity of disease was recorded in both seasons shown in the Table 3.

**Table 3:** Percent disease incidence and intensity of purple blotch of onion in Bihar during *Kharif* and *Rabi* 2018-19

| District | Block | Village | Stage (DAT) | *Kharif* | | *Rabi* | |
|---|---|---|---|---|---|---|---|
| | | | | PDI | Intensity (%) | PDI | Intensity (%) |
| Samastipur | Bibhutipur | Kerai | 75 | 13.45 | 15.45 | 27.39 | 28.42 |
| | | Belsandi Tara | 68 | 11.73 | 13.62 | 25.13 | 32.08 |
| | | Patpara | 72 | 11.53 | 15.78 | 26.53 | 34.75 |
| | Dalsinghsarai | Basaria | 75 | 8.74 | 10.85 | 23.48 | 31.25 |
| | | Pagra | 75 | 12.25 | 15.45 | 21.42 | 28.05 |
| | | Mathurapur | 72 | 10.85 | 15.32 | 20.78 | 26.75 |
| | Kalyanpur | Madhurapur | 65 | 9.95 | 13.78 | 32.17 | 37.25 |
| | | Ladaura | 65 | 12.45 | 13.25 | 35.76 | 38.45 |
| | | Govindbari | 68 | 13.65 | 16.15 | 33.86 | 38.16 |
| | **Mean** | | | **11.62** | **14.41** | **27.39** | **32.79** |
| Nalanda | Chandi | Gauri | 75 | 17.75 | 22.50 | 31.32 | 34.75 |
| | | Haheshpur | 75 | 19.15 | 23.85 | 33.64 | 36.62 |
| | | Dayalpur | 70 | 20.24 | 25.46 | 32.95 | 36.10 |
| | Noorsarai | Pariaunna | 68 | 18.65 | 23.32 | 37.17 | 38.95 |
| | | CharuviBeldari | 60 | 20.95 | 26.15 | 35.11 | 37.75 |
| | | Bara Khurd | 60 | 19.16 | 23.65 | 36.71 | 38.52 |
| | Bihar Sarif | Sohdih | 75 | 18.25 | 21.05 | 33.16 | 36.45 |
| | | Pahadi | 70 | 19.15 | 24.35 | 35.55 | 35.26 |
| | | Paroha | 70 | 20.05 | 26.75 | 34.22 | 35.35 |
| | **Mean** | | | **19.26** | **24.12** | **34.42** | **36.64** |
| Vaishali | Desari | Azampur | 75 | 12.85 | 17.15 | 17.62 | 21.25 |
| | | Phatikwara | 75 | 18.85 | 21.65 | 21.87 | 24.32 |
| | | Khur Rampur | 72 | 18.75 | 23.05 | 23.49 | 27.15 |
| | Jandaha | Adalpur | 65 | 21.05 | 25.01 | 25.58 | 28.35 |
| | | Basantpur | 60 | 19.65 | 24.50 | 23.84 | 28.16 |
| | | HasanpurBuzurg | 65 | 20.45 | 24.25 | 24.36 | 26.85 |
| | Mahua | Kushahar | 70 | 21.24 | 27.15 | 26.38 | 27.75 |
| | | Paharpur | 70 | 21.05 | 28.30 | 27.29 | 29.05 |
| | | Hakimpur | 68 | 16.35 | 19.85 | 25.41 | 28.15 |
| | **Mean** | | | **19.03** | **23.43** | **23.98** | **26.78** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Buxar | Dumraon | Turiganj | 75 | 13.75 | 15.84 | 21.84 | 25.06 |
| | | Rampur | 65 | 14.05 | 17.35 | 23.06 | 26.15 |
| | | BhojpurKadid | 70 | 15.25 | 19.05 | 22.75 | 26.95 |
| | Semari | KatharKhurd | 70 | 12.85 | 18.32 | 23.05 | 27.35 |
| | | Kazipur | 68 | 14.26 | 20.12 | 25.14 | 30.25 |
| | | Ramdhanpur | 68 | 13.72 | 20.05 | 25.35 | 31.05 |
| | Chakki | Arak | 60 | 15.16 | 22.15 | 24.75 | 30.45 |
| | | Raghunathpur | 75 | 14.85 | 20.95 | 26.16 | 31.75 |
| | | Pakarahi | 75 | 17.35 | 23.06 | 27.65 | 31.65 |
| | **Mean** | | | **14.59** | **19.65** | **24.47** | **28.96** |
| Bhojpur | Koilwar | New Mohamadpur | 65 | 16.24 | 19.35 | 27.15 | 33.40 |
| | | Navadih | 65 | 16.85 | 20.75 | 25.32 | 31.05 |
| | | Pipara | 62 | 19.04 | 23.15 | 24.05 | 29.78 |
| | Bihiya | Bihiya | | 14.45 | 17.95 | 25.85 | 30.25 |
| | | Kattaya | 75 | 17.25 | 18.65 | 26.95 | 32.05 |
| | | Sandore | 70 | 13.26 | 17.45 | 23.78 | 29.02 |
| | Jagdishpur | Bara | 70 | 17.95 | 20.85 | 28.15 | 32.15 |
| | | Mishrouli | 70 | 19.64 | 21.62 | 29.08 | 31.75 |
| | | Kalpati | 75 | 15.85 | 20.78 | 27.45 | 29.85 |
| | **Mean** | | | **16.78** | **20.06** | **26.42** | **31.03** |
| **Eastern Champaran** | Tetaria | Kadama | 70 | 16.25 | 19.75 | 30.52 | **34.85** |
| | | Meghua | 70 | 17.36 | 22.05 | 28.45 | **33.26** |
| | | Semara | 65 | 15.15 | 20.15 | 32.16 | **38.05** |
| | Paharpur | North Nonia | 65 | 17.25 | 21.32 | 31.06 | **37.25** |
| | | South Nonia | 65 | 17.64 | 21.45 | 33.15 | **37.95** |
| | | Roopdih | 75 | 18.35 | 22.75 | 30.95 | **36.42** |
| | Madhuvan | Madhopur | 75 | 19.02 | 23.02 | 28.17 | **33.15** |
| | | Pakadia | 75 | 16.85 | 21.45 | 29.90 | **34.65** |
| | | Samaniya | 62 | 15.75 | 21.94 | 32.65 | **38.06** |
| | **Mean** | | | **17.07** | **21.54** | **30.78** | **35.96** |
| Begusarai | Begusarai | Jagdishpur | 65 | 21.25 | 26.32 | 28.75 | **34.42** |
| | | Keshawe | 60 | 19.62 | 26.05 | 32.84 | **37.06** |
| | | Karmaot Saukh | 72 | 21.68 | 27.45 | 33.35 | **36.75** |
| | Matihani | Matihani | 72 | 18.45 | 23.85 | 29.05 | **36.43** |
| | | Ramdiri | 68 | 17.42 | 23.80 | 28.96 | **34.95** |
| | | Dariapur | 68 | 18.52 | 25.32 | 29.75 | **36.05** |
| | Bachhwara | Jamunatad | 75 | 19.85 | 27.65 | 31.86 | **37.75** |
| | | Rashidpur | 70 | 21.25 | 28.76 | 32.35 | **38.24** |
| | | Chiranjeevipur | 70 | 20.56 | 26.78 | 33.04 | **36.67** |
| | **Mean** | | | **19.84** | **26.21** | **31.11** | **36.48** |

The disease was increased with increase in thrips population, whereas more thrips incidence was observed in rabi season in comparison to kharif season. It is also noticed that the purple blotch disease was more severe in high humidity. Yadav *et al.* 2013 reported that the disease may reach epidemic states during the favorable conditions of high relative humidity (80-90%) and optimum temperature. Working on survey of *Alternaria* leaf blight and other disease of onion, Patil and Patil (1991) concluded that it is the most predominant and severe diseases in the onion growing centre of the Maharashtra (Fig. 4).

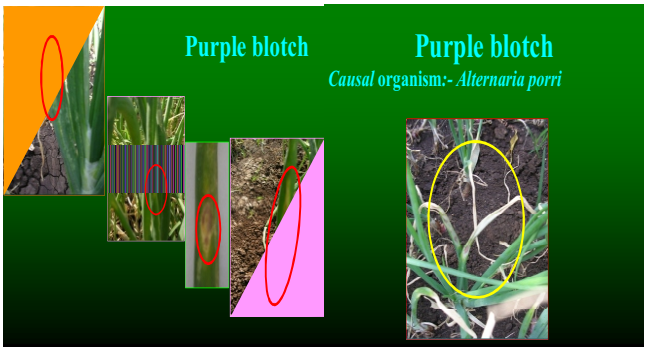


**Fig. 4:** Symptoms of disease of purple blotch of onion during 2018-19

Srivastava *et al.* (1994) in their report on status of field disease and insect pest of onion in India also indicated that purple blotch incidence was high in both rainy and post-rainy seasons when high humidity prevailed. Chethana (2000) who conducted survey in northern part of Karnataka during *kharif* in 1999 also revealed that incidence of purple blotch of onion was found in all districts of Northen Karnataka and noticed higher percent disease incidence in Ronihal village (Basavanabagewadi taluk) of Bijapur district and lowest in Wadullur village of Raichur taluk.

A survey on *Alternaria* leaf blight and other diseases of onion (Fillinger *et al.*, 2016) concluded that it is the most

predominant and severe disease in the onion growing areas of Maharashtra. Kale and Ajjappalavara (2014) in their report on status of field diseases and insect pest of onion in India also indicated that purple blotch disease incidence was high in both winter and post winter seasons when high humidity prevailed.

## CONCLUSION

It is revealed that the severity of disease varies from locality to locality. The severity of disease was also dependent on inoculums load, environmental conditions prevailing in different localities. The incidence and intensity was observed more during high humidity conditions and varies depend on temperature and relative humidity. severity of disease more in Nalanda (36.64%) and less in Vaishali (26.78%) were recorded during Rabi season, while less disease intensity ((14.41%) in Samastipur district recorded in kharif season with highest value 26.21 % in Begusarai

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