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Occurrence and distribution of bacterial blight of pomegranate caused by *Xanthomonas axonopodis* pv. *punicae* in Latur and Osmanabad districts of Marathwada region

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ABSTRACT : An extensive survey was carried out during *Kharif*, 2010 in the month of September -October in Latur and Osmanabad districts. The different orchards of Latur, Chakur, Renapur, Ausa, Nilanga, Shirur Anantpal, Udgir, Deoni, Jalkot and Ahmedpur tahsil of Latur district and Osmanabad, Tuljapur, Lohara, Kalamb, Paranda, Bhum, Washi and Umarga tahsil of Osmanabad district of Maharashtra state were surveyed to find out the disease severity of oily spot disease of pomegranate in these orchards. The observation of per cent orchards affected, per cent incidence on tree and per cent disease severity in orchards were recorded during the survey of oily spot of pomegranate. The data collected during the survey of oily spot of pomegranate clearly indicate that the disease was present in moderate to severe form in most of the orchards of Latur and Osmanabad district, however some orchards were found free from the disease. The severity of the disease was maximum in Udgir tahsil followed by Renapur and Nilanga, whereas it was maximum in Tuljapur followed by Osmanabad and Lohara tahsils of Osmanabad district. The maximum per cent disease incidence was 80.00 per cent in Latur followed by Udgir (72.72%), Renapur (66.66%), Shirur Anantpal (60%) and Ausa (57.14%). The minimum per cent disease incidence of bacterial blight of pomegranate was found in Jalkot and Deoni *i.e.*, 33.33 per cent. In Osmanabad district, the maximum per cent disease incidence was found in Lohara (83.33%) followed by Tuljapur (72.72%), Osmanabad (57.14%) and Washi (44.44%). The minimum per cent disease incidence of bacterial blight of pomegranate was found in Bhum (16.60%), Kalamb (33.33), Umarga (33.33%) and Paranda (37.50%).

KEY WORDS : *Xanthomonas axonopodis* pv. *punicae*, Oily spot, Pomegranate, Survey, Disease incidence, Severity

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In India, pomegranate is cultivated throughout country. The area under pomegranate cultivation in India is more than 1.27 lakh hacters with 8.21 lakh tones production. Maharashtra is the leading state in India and

about 69.50 per cent area of pomegranate cultivation in India is concentrated in Maharashtra. The area under pomegranate in Maharashtra is 96.5 thousand hacter with 5.96 lakh tones production (Anonymous, 2009). The

recent pomegranate cultivation in Maharashtra has been threatened due to incidence of leaf blight (oily spot) disease (*Xanthomonas axonopodis* pv. *punicae*). It resulted in enormous losses to pomegranate orchards, as it renders fruits to become unfit for consumption and market. The disease has spread like wildfire in the pomegranate plantation in the Maharashtra, particularly in the districts of Solapur, Sangali, Satara, Osmanabad and Latur. Therefore, the present investigation was planned to find out the disease incidence and severity of bacterial blight of pomegranate in Latur and Osmanabad district of Marathwada region.

RESEARCH PROCEDURE

An extensive survey was carried out during *Kharif*, 2010 in the month of September -October in Latur and Osmanabad districts. The different orchards of Latur, Chakur, Renapur, AUSA, Nilanga, Shirur Anantpal, Udgir, Deoni, Jalkot and Ahmedpur tahsil of Latur district and Osmanabad, Tuljapur, Lohara, Kalamb, Paranda, Bhum, Washi and Umarga tahsil of Osmanabad district of Maharashtra state were surveyed to find out the disease severity of bacterial blight disease of pomegranate in these orchards. The observation of per cent orchards affected, per cent incidence on tree and per cent disease severity in orchards were recorded during the survey of bacterial blight of pomegranate.

Disease parameters measured :

Incidence (Prevalence or Frequency) :

The per cent incidence was calculated by recording observations on plant units infected such as whole plants, leaves, fruits, twigs etc.

Intensity (Severity) :

The per cent disease severity was calculated by recording observations of the area or a volume of a plant tissue diseased.

Per cent disease incidence was recorded by using formulae:

$$\text{Incidence on trees (\%)} = \frac{\text{No. of infected trees}}{\text{Total plants}} \times 100$$

$$\text{Leaf / Stem / Fruit blight incidence (\%)} = \frac{\text{No. of infected samples}}{\text{Total samples observed in a set}} \times 100$$

$$\text{Disease severity (\%)} = \frac{\text{Sum of disease grade observed}}{\text{Total samples observed in a set} \times \text{Max. grade}} \times 100$$

Severity on a tree :

Severity on a tree (on 1.0 basis) was calculated by giving the score for:

Leaf Blight = 0.1, Fruit Blight = 0.7 and Stem Blight = 0.2 and calculated by applying following formula :

$$\text{Severity on a tree} = \text{LB\%} \times 0.1 + \text{FB\%} \times 0.7 + \text{SB\%} \times 0.2$$

Sampling methodology :

10 spots in an orchard were selected with 4 spots covering 4 corners and other 6 along the two diagonals of the orchard. 2 plants were selected at each spot so total plants examined were 20.

Sampling methodology for units :

Leaves :

3 to 5 twigs/branch were selected from all 4 sides of a tree and at least 10 leaves on each twig were observed for disease.

Fruits :

At least 10 fruits were selected each from all 4 sides of a tree and disease severity was observed.

Stems :

3-5 twigs/branch were selected and at least 4 branches from all 4 sides of a tree were selected for recording observation of disease severity.

RESEARCH ANALYSIS AND REASONING

The results of the present investigation in given in Table 1 to 4.

The data presented in Table 1 clearly indicated that the disease was present in moderate to severe form in most of the orchards of Latur district, however, some orchards were found free from the disease. The severity of the disease was maximum in Udgir tahsil followed by Renapur and Nilanga. Maximum disease severity was found in the orchard of Gurdhal village of Udgir Tahsil (58.9 %). The disease severity recorded during the survey of Osmanabad district is presented in Table 2. The data clearly indicated that the disease was present in moderate to severe form in most of the orchards, however some orchards were found free from the disease. The severity of the disease was found maximum in Dhanori village of Lohara tehsil (57.0 %).

Table 1 : Incidence and severity of bacterial blight of pomegranate growing areas of Latur district

| Sr. No. | Taluka | Village | Age of orchard (Yr) | Variety | Date of observation | Observations (I-Incidence in % and S-Severity in %) | | | | | | Severity on tree |
|---------|--------------|---------------|---------------------|----------|---------------------|---|----|-------|----|------|----|------------------|
| | | | | | | Leaf | | Fruit | | Stem | | |
| | | | | | | I | S | I | S | I | S | |
| 1. | Latur | Bhadi | 2 | Bhagwa | 25/8/10 | 60 | 35 | 75 | 40 | 15 | 7 | 32.9 |
| 2. | Latur | Bhadi | 3 | Bhagwa | 25/8/10 | 60 | 35 | 50 | 28 | 0 | 0 | 23.1 |
| 3. | Latur | Bhadi | 3 | Bhagwa | 25/8/10 | 40 | 25 | 35 | 14 | 0 | 0 | 8.3 |
| 4. | Latur | Bhadi | 3 | Bhagwa | 25/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 5. | Latur | Bhadi | 5 | Ganesh | 25/8/10 | 20 | 10 | 40 | 15 | 0 | 0 | 7.5 |
| 6. | Chakur | Ashta | 7 | Ganesh | 26/8/10 | 45 | 18 | 40 | 22 | 20 | 10 | 19.2 |
| 7. | Chakur | Ashta | 2 | Bhagwa | 26/8/10 | 10 | 3 | 10 | 5 | 0 | 0 | 3.8 |
| 8. | Chakur | Ashta | 4 | Ganesh | 26/8/10 | 45 | 23 | 55 | 36 | 25 | 15 | 30.5 |
| 9. | Chakur | Ashta | 4 | Ganesh | 26/8/10 | 50 | 20 | 50 | 20 | 0 | 0 | 16 |
| 10. | Chakur | Ashta | 1.5 | Bhagwa | 26/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 11. | Chakur | Ashta | 1.5 | Bhagwa | 26/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 12. | Chakur | Ashta | 3 | Bhagwa | 26/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 13. | Renapur | Khrola | 7 | Ganesh | 27/8/10 | 70 | 45 | 70 | 55 | 20 | 10 | 45 |
| 14. | Renapur | Khrola | 4 | Bhagwa | 27/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 15. | Renapur | Darjiborgaon | 3 | Bhagwa | 27/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 16. | Renapur | Darjiborgaon | 3 | Bhagwa | 27/8/10 | 85 | 55 | 90 | 70 | 20 | 15 | 57.5 |
| 17. | Renapur | Darjiborgaon | 3 | Bhagwa | 27/8/10 | 40 | 28 | 50 | 26 | 0 | 0 | 21.0 |
| 18. | Renapur | Darjiborgaon | 3 | Bhagwa | 27/8/10 | 90 | 60 | 90 | 65 | 25 | 15 | 54.5 |
| 19. | Renapur | Wala | 1.5 | Bhagwa | 27/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 20. | Renapur | Kolgaon | 4 | Bhagwa | 27/8/10 | 70 | 45 | 90 | 65 | 30 | 20 | 54 |
| 21. | Renapur | Khalangi | 4 | Bhagwa | 27/8/10 | 45 | 18 | 70 | 50 | 0 | 0 | 36.8 |
| 22. | Ausa | Ekatpur | 1.5 | Bhagwa | 28/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 23. | Ausa | Maslanga | 3 | Bhagwa | 28/8/10 | 10 | 5 | 0 | 0 | 0 | 0 | 0.5 |
| 24. | Ausa | Matola | 2.5 | Bhagwa | 28/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 25. | Ausa | Tungi | 3 | J.Bhagwa | 28/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 26. | Ausa | Tungi | 3 | J.Bhagwa | 28/8/10 | 30 | 11 | 35 | 20 | 0 | 0 | 15.1 |
| 27. | Ausa | Killari | 2.5 | Bhagwa | 28/8/10 | 35 | 12 | 40 | 18 | 0 | 0 | 13.8 |
| 28. | Ausa | Karkaj | 4 | Bhagwa | 28/8/10 | 40 | 18 | 45 | 29 | 0 | 0 | 22.1 |
| 29. | Nilanga | Pan chincholi | 7 | Arkta | 30/8/10 | 60 | 45 | 80 | 60 | 10 | 7 | 47.9 |
| 30. | Nilanga | Pan chincholi | 7 | Arkta | 30/8/10 | 55 | 38 | 90 | 70 | 0 | 0 | 52.8 |
| 31. | Nilanga | Anandwadi | 5 | Ganesh | 30/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 32. | Nilanga | Jau | 4 | J.Bhagwa | 30/8/10 | 15 | 5 | 10 | 5 | 0 | 0 | 4.0 |
| 33. | Nilanga | Korale | 3 | Bhagwa | 30/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 34. | Nilanga | Borsuri | 1.5 | J.Bhagwa | 30/8/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 35. | Shirurantpal | Anandwadi | 2.5 | Bhagwa | 2/09/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 36. | Shirurantpal | Anandwadi | 2.5 | Bhagwa | 2/09/10 | 35 | 15 | 36 | 19 | 0 | 0 | 19.1 |
| 37. | Shirurantpal | Chamarga | 4 | Bhagwa | 2/09/10 | 40 | 16 | 30 | 11 | 0 | 0 | 21.3 |
| 38. | Shirurantpal | Chamarga | 5 | Ganesh | 2/09/10 | 45 | 19 | 70 | 50 | 0 | 0 | 41.9 |
| 39. | Shirurantpal | Ujadgaon | 5 | Ganesh | 2/09/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 40. | Udgir | Kaulkhed | 4 | Bhagwa | 10/9/10 | 60 | 40 | 80 | 75 | 35 | 5 | 43.7 |
| 41. | Udgir | Kaulkhed | 5 | Bhagwa | 10/9/10 | 40 | 12 | 45 | 25 | 0 | 0 | 41.1 |
| 42. | Udgir | Kaulkhed | 7 | Ganesh | 10/9/10 | 60 | 45 | 78 | 45 | 27 | 4 | 42.3 |
| 43. | Udgir | Negalgaon | 2.5 | J.Bhagwa | 10/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 44. | Udgir | Negalgaon | 2.5 | J.Bhagwa | 10/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 45. | Udgir | Gurdhal | 3 | Bhagwa | 10/9/10 | 100 | 90 | 85 | 96 | 35 | 14 | 58.9 |
| 46. | Udgir | Navandi | 3 | Bhagwa | 10/9/10 | 60 | 35 | 75 | 40 | 15 | 7 | 43.1 |
| 47. | Udgir | Navandi | 4 | Bhagwa | 10/9/10 | 80 | 55 | 85 | 95 | 30 | 9 | 50.5 |
| 48. | Udgir | Navandi | 2.5 | J.Bhagwa | 10/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 49. | Udgir | Islampur | 2.5 | J.Bhagwa | 10/9/10 | 60 | 46 | 50 | 60 | 0 | 0 | 42.5 |
| 50. | Udgir | Mogha | 5 | Bhagwa | 10/9/10 | 20 | 25 | 30 | 15 | 0 | 0 | 15.9 |
| 51. | Deoni | Jawalga | 0.2 | J.Bhagwa | 15/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 52. | Deoni | Jawalga | 0.3 | Bhagwa | 15/9/10 | 40 | 17 | 30 | 16 | 0 | 0 | 22.7 |
| 53. | Deoni | Jawalga | 0.5 | J.Bhagwa | 15/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 54. | Jalkot | Jalkot | 7 | Ganesh | 15/9/10 | 60 | 50 | 45 | 33 | 0 | 0 | 44.7 |
| 55. | Jalkot | Jalkot | 4 | Bhagwa | 15/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 56. | Jalkot | Jalkot | 4 | Bhagwa | 15/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 57. | Ahmedpur | Kopra | 5 | Bhagwa | 22/9/10 | 40 | 18 | 45 | 29 | 0 | 0 | 20.4 |
| 58. | Ahmedpur | Walsungi | 2.5 | J.Bhagwa | 22/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 59. | Ahmedpur | Walsungi | 2.5 | J.Bhagwa | 22/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 60. | Ahmedpur | Walsungi | 2.5 | J.Bhagwa | 22/9/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 61. | Ahmedpur | Ambegaon | 5 | Bhagwa | 22/9/10 | 35 | 17 | 30 | 18 | 0 | 0 | 26.1 |

Table 2 : Incidence and severity of bacterial blight of pomegranate growing areas of Osmanabad district

| Sr. No. | Taluka | Village | Age of orchard (Yr) | Variety | Date of observation | Observations (I-Incidence in % and S-Severity in %) | | | | | | Severity on tree |
|---------|-----------|--------------|---------------------|----------|---------------------|---|----|-------|----|------|----|------------------|
| | | | | | | Leaf | | Fruit | | Stem | | |
| | | | | | | I | S | I | S | I | S | |
| 1. | Osmanabad | Kond | 4 | Bhagwa | 1/10/10 | 70 | 53 | 90 | 70 | 15 | 10 | 56.3 |
| 2. | Osmanabad | Kond | 5 | Bhagwa | 1/10/10 | 65 | 48 | 90 | 65 | 20 | 12 | 52.7 |
| 3. | Osmanabad | Kond | 7 | Ganesh | 1/10/10 | 65 | 42 | 90 | 60 | 0 | 0 | 46.2 |
| 4. | Osmanabad | Khanapur | 11 | Ganesh | 1/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 5. | Osmanabad | Nadurga | 4 | Bhagwa | 1/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 6. | Osmanabad | Nadurga | 4 | Bhagwa | 1/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 7. | Osmanabad | Upla | 4 | Bhagwa | 1/10/10 | 40 | 27 | 20 | 10 | 0 | 0 | 40.3 |
| 8. | Tuljapur | Yevati | 5 | Bhagwa | 3/10/10 | 55 | 32 | 80 | 60 | 0 | 0 | 45.2 |
| 9. | Tuljapur | Andur | 4 | Bhagwa | 3/10/10 | 60 | 38 | 90 | 70 | 0 | 0 | 52.8 |
| 10. | Tuljapur | Andur | 7 | Ganesh | 3/10/10 | 65 | 43 | 90 | 65 | 15 | 10 | 51.8 |
| 11. | Tuljapur | Khadki | 3 | J.Bhagwa | 3/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 12. | Tuljapur | Khadki | 3 | J.Bhagwa | 3/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 13. | Tuljapur | Kumbhari | 5 | Bhagwa | 3/10/10 | 40 | 27 | 60 | 40 | 0 | 0 | 30.7 |
| 14. | Tuljapur | Kumbhari | 5 | Bhagwa | 3/10/10 | 40 | 23 | 70 | 55 | 0 | 0 | 40.8 |
| 15. | Tuljapur | Sindhphal | 4 | Bhagwa | 3/10/10 | 40 | 32 | 80 | 60 | 0 | 0 | 45.2 |
| 16. | Tuljapur | Apsinga | 5 | Bhagwa | 3/10/10 | 60 | 43 | 90 | 70 | 0 | 0 | 53.3 |
| 17. | Tuljapur | Kasai | 2.5 | J.Bhagwa | 3/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 18. | Tuljapur | Davlwradi | 6 | Ganesh | 3/10/10 | 45 | 29 | 80 | 60 | 0 | 0 | 44.9 |
| 19. | Lohara | Undergaon | 4 | Bhagwa | 5/10/10 | 40 | 22 | 60 | 45 | 1.5 | 1 | 33.9 |
| 20. | Lohara | Hipparag kh. | 6 | Bhagwa | 5/10/10 | 65 | 40 | 90 | 70 | 0 | 0 | 53.0 |
| 21. | Lohara | Dhanori | 5 | Bhagwa | 5/10/10 | 65 | 43 | 90 | 75 | 2 | 1 | 57.0 |
| 22. | Lohara | Dhanori | 5 | Ganesh | 5/10/10 | 45 | 18 | 50 | 30 | 2 | 1 | 23.0 |
| 23. | Lohara | Dhanori | 5 | Bhagwa | 5/10/10 | 55 | 27 | 80 | 60 | 0 | 0 | 44.7 |
| 24. | Lohara | Khed | 7 | Ganesh | 5/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 25. | Kalamb | Pratapapur | 3.5 | J.Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 26. | Kalamb | Pratapapur | 3.5 | J.Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 27. | Kalamb | Pratapapur | 4.5 | Bhagwa | 7/10/10 | 40 | 19 | 55 | 30 | 1.5 | 1 | 23.1 |
| 28. | Kalamb | Magrul | 3.5 | Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 29. | Kalamb | Pimpalgaon | 5 | Ganesh | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 30. | Kalamb | Adala | 4 | Bhagwa | 7/10/10 | 30 | 13 | 60 | 40 | 0 | 0 | 29.3 |
| 31. | Paranda | Paranda | 5 | Bhagwa | 7/10/10 | 32 | 19 | 30 | 22 | 0 | 0 | 22.8 |
| 32. | Paranda | Paranda | 5 | Bhagwa | 7/10/10 | 18 | 14 | 10 | 5 | 0 | 0 | 9.1 |
| 33. | Paranda | Paranda | 5 | Bhagwa | 7/10/10 | 10 | 5 | 10 | 5 | 0 | 0 | 6.9 |
| 34. | Paranda | Anala | 3 | J.Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 35. | Paranda | Anala | 3 | J.Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 36. | Paranda | Kadalgaon | 4 | Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 37. | Paranda | Kadalgaon | 4 | Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 38. | Paranda | Takali | 2.5 | J.Bhagwa | 7/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 39. | Bhum | Dindori | 3.5 | J.Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 40. | Bhum | Dindori | 3.5 | J.Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 41. | Bhum | Walvad | 4 | Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 42. | Bhum | Eit | 3 | J.Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 43. | Bhum | Eit | 3 | J.Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 44. | Bhum | Girvali | 4 | Bhagwa | 9/10/10 | 40 | 17 | 20 | 12 | 0 | 0 | 18.5 |
| 45. | Umarga | Murum | 4 | Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 46. | Umarga | Murum | 4 | Bhagwa | 9/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 47. | Umarga | Bhusani | 3 | J.Bhagwa | 9/10/10 | 35 | 25 | 20 | 16 | 0 | 0 | 15 |
| 48. | Washi | Washi | 4 | Arkta | 13/10/10 | 40 | 40 | 19 | 15 | 0 | 0 | 9 |
| 49. | Washi | Washi | 3.5 | Arkta | 13/10/10 | 35 | 17 | 20 | 10 | 0 | 0 | 7 |
| 50. | Washi | Washi | 4 | Arkta | 13/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 51. | Washi | Kelewadi | 5 | Ganesh | 13/10/10 | 50 | 30 | 26 | 30 | 15 | 11 | 18.8 |
| 52. | Washi | Kelewadi | 5 | Ganesh | 13/10/10 | 45 | 30 | 20 | 18 | 0 | 0 | 12.3 |
| 53. | Washi | Khanapur | 2.5 | Bhagwa | 13/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 54. | Washi | Khanapur | 2.5 | Bhagwa | 13/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 55. | Washi | Umarga | 4.5 | Bhagwa | 13/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |
| 56. | Washi | Umarga | 4.5 | Bhagwa | 13/10/10 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 |

Table 3 : Severity table of bacterial blight of pomegranate in Latur district

| Sr. No. | Taluka | No. of orchard surveyed | Disease severity | | | |
|---------|---------------|-------------------------|------------------|----------|-------|------|
| | | | Severe | Moderate | Trace | Free |
| 1. | Latur | 5 | - | 2 | 2 | 1 |
| 2. | Chakur | 7 | - | 3 | - | 4 |
| 3. | Renapur | 9 | 4 | 2 | - | 3 |
| 4. | Ausa | 7 | - | 3 | 1 | 3 |
| 5. | Nilanga | 6 | 2 | 1 | - | 3 |
| 6. | Shirurantapal | 5 | 1 | 2 | - | 2 |
| 7. | Udgir | 11 | 7 | 1 | - | 3 |
| 8. | Deoni | 3 | - | 1 | - | 2 |
| 9. | Jalkot | 3 | 1 | - | - | 2 |
| 10. | Ahmedpur | 5 | - | 2 | - | 3 |

Sever= >40 %, Moderate = >10 and <40 and Trace= >10%

Table 4 : Severity table of bacterial blight of pomegranate in Osmanabad district

| Sr. No | Taluka | No. of orchard surveyed | Disease severity | | | |
|--------|-----------|-------------------------|------------------|----------|-------|------|
| | | | Severe | Moderate | Trace | Free |
| 1. | Osmanabad | 7 | 4 | - | - | 3 |
| 2. | Tuljapur | 11 | 7 | 1 | - | 3 |
| 3. | Lohara | 6 | 3 | 2 | - | 1 |
| 4. | Kalamb | 6 | - | 2 | - | 4 |
| 5. | Paranda | 8 | - | 1 | 2 | 5 |
| 6. | Bhum | 6 | - | 1 | - | 5 |
| 7. | Umarga | 3 | - | - | 1 | 2 |
| 8. | Washi | 9 | - | 2 | 2 | 5 |

Sever= >40 %, Moderate = >10 and <40 and Trace= >10%

Table 5 : Per cent incidence of bacterial blight of pomegranate in Latur district

| Sr. No | Taluka | No. of orchard surveyed | Infected orchard | Per cent disease incidence |
|--------|---------------|-------------------------|------------------|----------------------------|
| 1. | Latur | 5 | 4 | 80 |
| 2. | Chakur | 7 | 3 | 42.25 |
| 3. | Renapur | 9 | 6 | 66.66 |
| 4. | Ausa | 7 | 4 | 57.14 |
| 5. | Nilanga | 6 | 3 | 50 |
| 6. | Shirurantapal | 5 | 3 | 60 |
| 7. | Udgir | 11 | 8 | 72.72 |
| 8. | Deoni | 3 | 1 | 33.33 |
| 9. | Jalkot | 3 | 1 | 33.33 |
| 10. | Ahmedpur | 5 | 2 | 40 |

Table 6 : Per cent incidence of bacterial blight of pomegranate in Osmanabad district

| Sr. No. | Taluka | No. of orchard surveyed | Infected orchard | Per cent disease incidence |
|---------|-----------|-------------------------|------------------|----------------------------|
| 1. | Osmanabad | 7 | 4 | 57.14 |
| 2. | Tuljapur | 11 | 8 | 72.72 |
| 3. | Lohara | 6 | 5 | 83.33 |
| 4. | Kalamb | 6 | 2 | 33.33 |
| 5. | Paranda | 8 | 3 | 37.5 |
| 6. | Bhum | 6 | 1 | 16.6 |
| 7. | Umarga | 3 | 1 | 33.33 |
| 8. | Washi | 9 | 4 | 44.44 |

Per cent disease incidence :

The per cent disease incidence of bacterial blight of pomegranate of Latur and Osmanabad districts were recorded during the survey and data so obtained are presented in Table 5 and 6. The data presented in Table 5 clearly revealed that the maximum per cent disease incidence was 80.00 per cent in Latur followed by Udgir (72.72%), Renapur (66.66%), Shirur Anantpal (60%) and Ausa (57.14%). The minimum per cent disease incidence of bacterial blight of pomegranate was found in Jalkot and Deoni *i.e.*, 33.33 per cent. The data presented in Table 6 clearly revealed that the maximum per cent disease incidence was found in Lohara (83.33%) followed by Tuljapur (72.72%), Osmanabad (57.14%) and Washi (44.44%). The minimum per cent disease incidence of bacterial blight of pomegranate was found in Bhum (16.60%), Kalamb (33.33), Umarga (33.33%) and Paranda (37.50%). The results of the present investigation on survey of disease incidence are correlated with the results of Mulla *et al.* (2008); Raju *et al.* (2012); Gamangatti and Patil (2013) and Suryawanshi *et al.* (2010).

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