Original Research Article

Screening of Resistencia for Spot Blotch in Barley (Hordeum vulgare L.) Genotypes

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A B S T R A C T

One hundred fifty genotypes of Barley (Hordeum vulgare L.) were screened for spot blotch disease caused by Bipolaris sorokiniana under natural condition. The crop was sown on 4th week of October 2015 and 2016 respectively. The RD-2503 genotype was used as check every after 20 lines and on the borders of the experimental plot. Out of one hundred fifty tested genotypes, nine genotypes were moderately resistant, eighty six were moderately susceptible, fifty-three genotypes was susceptible and rest two was found highly susceptible during crop season. Moderately resistant genotypes could be used for breeding programme for management of Spot Blotch of Barley.

Keywords
Barley, Bipolaris sorokiniana, Resistant, Susceptible.

Introduction

Barley (Hordeum vulgare L.) is a crop of international importance and stands fourth major food grain crop in the world, except the tropical regions. In India cultivated as a Rabi crop. Whereas in Uttar Pradesh the crop covers an area of about 1.70 lakh hectares with estimated production of 2.87 lakh tonnes and productivity of 16.90q/ha. The sowing being undertaken from October to December and harvesting from March to May, it is first cereal to be domesticated in Middle East at least 9000 year ago.

Vedas christen it as ‘Yav’ and mentioned its use in different religious ceremonies. It is a major source of food for large number of people living in the cooler semi-arid areas of the world. The crop is being used as food, animal feed and industrial raw material in food and beverages industry. However, the crop suffers significant yield losses from biotic stresses.

Among biotic stresses, Spot Blotch caused by Bipolaris sorokiniana (Sacc. in Sorok.) Shoemaker, syn. Helminthosporium sativus, Teleomorph Cochliobolus sativus (Ito and Kuribayashi) Dreschsl., Ex Dastur. is a serious fungal disease with a wide geographical distribution. It is a major disease in warmer and humid growing regions of the world (Kuldeep et al., 2008).
Materials and Methods

The experiment was conducted at agriculture experimental station of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during 2015-16 and 2016-17. Seeds of 150 genotypes were collected from All India Co-ordinated Wheat and Barley Improvement Project, Department of Genetics and Plant Breeding, Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.). Each genotype / lines was sown (4th week of October) in single row of one meter length at a distance of 25 cm row to row and 5 cm plant to plant in augmented design. The RD-2503 genotype was used as check every after 20 lines and on the borders of the experimental plot. All the recommended agronomical and cultural practices were followed for raising the crop. The observations on disease severity were recorded from the date of first appearance of disease in both year at flowering, soft dough and hard dough stage, randomly 5 plants were selected and tagged in each row. The disease score of each selected plant were recorded by using Kumar et al., (1998)’s double digit scale based on per cent blighted area on the flag and flag-1 leaf as given in table-1.

Results and Discussion

Since the use of resistant varieties is considered to be the best method for disease management, therefore, the present studies were carried out for the search of sources of resistance against the spot blotch of barley caused by Bipolaris sorokiniana. A sum total of 150 genotypes of Barley were screened against Bipolaris sorokiniana under natural field condition (Table 2). It is evident from the (Table.2) that the disease first appeared in the lower leaves of the every genotype. Among screened one fifty genotypes, none was found immune (score 00-01) and resistant (score12-24) (Table 3). Nine genotypes were found moderately resistant against spot blotch. Some of these were DWR46, DWR47, DWR49, K861, K863, K878, K846, K868, and NDB1413 (score 34-46) (Table3). Eighty six genotypes were found moderately susceptible against spot blotch.

Table 1. Double digit scale, based on percent blighted area on the flag leaf and one leaf just below given by Kumar et al., (1998)

| Sl. No. | Severity | Disease response | Rating | Range of value |
|--------|----------|------------------|--------|----------------|
|        | Flag leaf | Flag-1 leaf      |        |                |
| 1.     | 0         | 0 – 1            | Immune (I) | 00 - 01        |
| 2.     | 1-2       | 2 – 4            | Resistant (R) | 12 - 24        |
| 3.     | 3-4       | 4 – 6            | Moderately Resistant (MR) | 34 - 46        |
| 4.     | 5-6       | 6 – 8            | Moderately susceptible (MS) | 56 - 68        |
| 5.     | 7-8       | 8 – 9            | Susceptible (S) | 78 - 89        |
| 6.     | 9         | 9                | Highly susceptible (HS) | 99             |

- First & second value respectively, represents percent blighted area on the flag leaf & flag-1 leaves.
- Values 1,2,3,4,5,6,7,8,& 9, respectively correspond to 10,20,30,40,50,60,70,80 & 90 percent blighted area.
Table.2 Response of barley genotypes against spot blotch disease (*B. sorokiniana*) under natural disease pressure 2015-16 & 2016-17

| S.No. | Genotypes | Date of first appearance of disease 2015-16 | Date of first appearance of disease 2016-17 | Foliar blight score (0-9dd) | Flowering stage 2015-16 | Soft dough stage 2016-17 | Hard dough stage 2016-17 |
|-------|-----------|---------------------------------------------|--------------------------------------------|-----------------------------|-------------------------|--------------------------|--------------------------|
| A     | Moderately resistant |                                |                                            |                             |                         |                          |                          |
| 1.    | DWR 46    | 06/02/2016                                  | 17/02/2017                                 |                             | 12                      | 02                       | 24                       | 24                       | 46                      | 46                      |
| 2.    | DWR 47    | 04/02/2016                                  | 20/02/2017                                 |                             | 02                      | 13                       | 24                       | 23                       | 34                      | 34                      |
| 3.    | DWR 49    | 10/02/2016                                  | 16/02/2017                                 |                             | 12                      | 12                       | 24                       | 23                       | 34                      | 35                      |
| 4.    | K861      | 19/02/2016                                  | 23/02/2017                                 |                             | 14                      | 13                       | 25                       | 24                       | 34                      | 36                      |
| 5.    | K863      | 25/01/2016                                  | 18/01/2017                                 |                             | 12                      | 12                       | 23                       | 23                       | 36                      | 35                      |
| 6.    | K878      | 24/02/2016                                  | 28/02/2017                                 |                             | 13                      | 12                       | 24                       | 13                       | 46                      | 46                      |
| 7.    | K846      | 24/02/2016                                  | 26/02/2017                                 |                             | 12                      | 02                       | 25                       | 24                       | 36                      | 36                      |
| 8.    | K868      | 11/02/2016                                  | 13/02/2017                                 |                             | 02                      | 13                       | 23                       | 13                       | 35                      | 36                      |
| 9.    | NDB 1413  | 25/02/2016                                  | 28/02/2017                                 |                             | 13                      | 12                       | 24                       | 24                       | 36                      | 46                      |
| B     | Moderately Susceptible |                                |                                            |                             |                         |                          |                          |
| 1.    | RD 2676   | 04/01/2016                                  | 10/01/2017                                 |                             | 12                      | 13                       | 35                       | 36                       | 68                      | 67                      |
| 2.    | RD 2670   | 02/01/2016                                  | 20/01/2017                                 |                             | 12                      | 02                       | 35                       | 35                       | 67                      | 68                      |
| 3.    | BH 648    | 01/01/2016                                  | 04/02/2017                                 |                             | 13                      | 12                       | 36                       | 36                       | 57                      | 67                      |
| 4.    | BH 657    | 28/12/2015                                  | 01/01/2017                                 |                             | 12                      | 13                       | 36                       | 37                       | 67                      | 68                      |
| 5.    | HUB 173   | 29/12/2015                                  | 01/01/2017                                 |                             | 12                      | 01                       | 46                       | 45                       | 57                      | 68                      |
| 6.    | RD 2035   | 26/12/2015                                  | 04/01/2017                                 |                             | 13                      | 12                       | 45                       | 45                       | 58                      | 58                      |
| 7.    | RD 2634   | 27/12/2015                                  | 04/01/2017                                 |                             | 12                      | 01                       | 35                       | 34                       | 57                      | 58                      |
| 8.    | K729      | 26/12/2015                                  | 01/01/2017                                 |                             | 12                      | 13                       | 46                       | 45                       | 58                      | 57                      |
| 9.    | RD 2552   | 26/12/2015                                  | 25/01/2017                                 |                             | 25                      | 24                       | 56                       | 56                       | 68                      | 59                      |
| 10.   | RD 2668   | 15/12/2015                                  | 05/01/2017                                 |                             | 12                      | 13                       | 45                       | 45                       | 68                      | 58                      |
| 11.   | NDB 1245  | 12/12/2015                                  | 26/01/2017                                 |                             | 02                      | 13                       | 36                       | 34                       | 57                      | 67                      |
| 12.   | K 551     | 25/12/2015                                  | 25/01/2017                                 |                             | 12                      | 13                       | 35                       | 37                       | 67                      | 67                      |
| 13.   | Lakhan    | 25/12/2015                                  | 25/01/2017                                 |                             | 01                      | 12                       | 46                       | 46                       | 56                      | 68                      |
| 14.   | RD 2624   | 25/12/2015                                  | 25/01/2017                                 |                             | 12                      | 02                       | 47                       | 47                       | 58                      | 68                      |
| 15.   | K791      | 25/12/2015                                  | 25/01/2017                                 |                             | 12                      | 13                       | 37                       | 35                       | 59                      | 67                      |
|   |     |     |     |     |     |     |     |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 16. | NDB1276 | 25/12/2015 | 26/01/2017 | 13 | 13 | 46 | 46 | 57 | 58 |
| 17. | RD2696 | 25/12/2015 | 29/12/2016 | 12 | 13 | 37 | 36 | 67 | 57 |
| 18. | HUB 181 | 24/12/2015 | 30/12/2016 | 12 | 02 | 46 | 47 | 67 | 67 |
| 19. | HUB182 | 24/12/2015 | 29/12/2016 | 02 | 12 | 36 | 34 | 67 | 67 |
| 20. | HUB182 | 24/12/2015 | 04/01/2017 | 12 | 13 | 35 | 37 | 68 | 67 |
| 21. | HUB186 | 15/12/2015 | 05/01/2017 | 13 | 12 | 36 | 37 | 68 | 57 |
| 22. | HUB106 | 17/12/2015 | 07/01/2017 | 13 | 02 | 45 | 46 | 57 | 68 |
| 23. | K822   | 27/12/2015 | 05/01/2017 | 01 | 12 | 46 | 45 | 57 | 67 |
| 24. | K823   | 27/12/2015 | 06/01/2017 | 12 | 13 | 47 | 47 | 58 | 57 |
| 25. | K825   | 27/12/2015 | 07/01/2017 | 12 | 01 | 35 | 36 | 59 | 67 |
| 26. | K830   | 07/12/2015 | 07/12/2016 | 12 | 02 | 45 | 46 | 67 | 57 |
| 27. | NDB1319| 28/12/2015 | 07/01/2017 | 14 | 12 | 36 | 37 | 68 | 58 |
| 28. | NDB1402| 27/12/2015 | 02/01/2017 | 13 | 12 | 56 | 36 | 57 | 57 |
| 29. | NDB1405| 28/12/2015 | 08/01/2017 | 02 | 01 | 45 | 45 | 58 | 58 |
| 30. | PL801  | 25/12/2015 | 01/01/2017 | 12 | 12 | 37 | 37 | 67 | 68 |
| 31. | PL802  | 26/12/2015 | 06/01/2017 | 13 | 12 | 37 | 37 | 57 | 68 |
| 32. | RD2701 | 28/12/2015 | 08/01/2017 | 02 | 12 | 45 | 46 | 58 | 57 |
| 33. | RD2704 | 24/12/2015 | 16/01/2017 | 13 | 12 | 45 | 45 | 69 | 67 |
| 34. | RD2708 | 25/12/2015 | 06/01/2017 | 12 | 13 | 56 | 45 | 68 | 56 |
| 35. | RD2711 | 26/12/2015 | 06/01/2017 | 02 | 13 | 36 | 37 | 68 | 58 |
| 36. | RD2714 | 26/12/2015 | 20/01/2017 | 12 | 12 | 45 | 46 | 57 | 59 |
| 37. | RD2717 | 28/12/2015 | 08/01/2017 | 13 | 02 | 56 | 56 | 58 | 57 |
| 38. | RD2719 | 26/12/2015 | 20/01/2017 | 12 | 02 | 36 | 37 | 59 | 67 |
| 39. | RD2720 | 26/12/2015 | 30/12/2016 | 13 | 03 | 56 | 57 | 57 | 67 |
| 40. | RD2722 | 26/12/2015 | 02/01/2017 | 02 | 13 | 36 | 36 | 68 | 67 |
| 41. | UPB1   | 26/12/2015 | 04/01/2017 | 12 | 01 | 47 | 47 | 68 | 68 |
| 42. | UPB4   | 23/12/2015 | 01/01/2017 | 02 | 12 | 46 | 46 | 67 | 68 |
| 43. | JB123  | 15/12/2015 | 05/01/2017 | 13 | 12 | 45 | 46 | 68 | 57 |
| 44. | JB126  | 26/12/2015 | 06/01/2017 | 12 | 13 | 36 | 37 | 69 | 57 |
| 45. | JB127  | 24/12/2015 | 08/01/2017 | 02 | 13 | 36 | 35 | 57 | 58 |
| 46. | JB129  | 20/12/2015 | 03/01/2017 | 02 | 13 | 45 | 34 | 58 | 59 |
| 47. | JB134  | 24/12/2015 | 04/01/2017 | 12 | 01 | 56 | 56 | 59 | 67 |
|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
|48. | K839 | 01/12/2015 | 01/01/2017 | 13 | 02 | 34 | 45 | 57 | 68 | 69 |
|49. | K853 | 16/12/2015 | 16/01/2017 | 24 | 23 | 56 | 45 | 68 | 68 | 68 |
|50. | K 856 | 26/12/2015 | 06/01/2017 | 02 | 02 | 34 | 35 | 68 | 68 | 68 |
|51. | K 857 | 24/12/2015 | 04/01/2017 | 13 | 13 | 46 | 47 | 67 | 67 | 67 |
|52. | K858 | 27/12/2015 | 07/01/2017 | 02 | 01 | 37 | 37 | 67 | 67 | 67 |
|53. | K859 | 16/12/2015 | 16/01/2017 | 13 | 12 | 36 | 36 | 67 | 67 | 67 |
|54. | K860 | 28/12/2015 | 15/01/2017 | 23 | 12 | 46 | 46 | 68 | 68 | 69 |
|55. | K 862 | 25/12/2015 | 15/01/2017 | 02 | 12 | 35 | 35 | 57 | 68 | 68 |
|56. | K864 | 25/12/2015 | 20/01/2017 | 13 | 02 | 37 | 37 | 58 | 58 | 58 |
|57. | K865 | 25/12/2015 | 26/01/2017 | 02 | 13 | 35 | 35 | 58 | 58 | 58 |
|58. | K866 | 25/12/2015 | 26/01/2017 | 12 | 02 | 35 | 37 | 67 | 67 | 58 |
|59. | NDB 1411 | 28/12/2015 | 26/01/2017 | 12 | 13 | 36 | 36 | 67 | 67 | 59 |
|60. | NDB 1412 | 28/12/2015 | 26/01/2017 | 01 | 12 | 37 | 34 | 68 | 68 | 57 |
|61. | NDB 1414 | 05/12/2015 | 15/01/2017 | 13 | 12 | 46 | 46 | 68 | 68 | 56 |
|62. | NDB 1417 | 28/12/2015 | 27/01/2017 | 02 | 01 | 35 | 46 | 69 | 69 | 57 |
|63. | NDB1418 | 25/12/2015 | 24/01/2017 | 13 | 12 | 45 | 45 | 69 | 69 | 67 |
|64. | NDB1419 | 01/12/2015 | 05/01/2017 | 13 | 12 | 46 | 46 | 68 | 68 | 68 |
|65. | NDB1420 | 28/12/2015 | 05/01/2017 | 13 | 02 | 34 | 34 | 67 | 67 | 69 |
|66. | NDB1173 | 08/12/2015 | 04/01/2017 | 02 | 13 | 37 | 37 | 67 | 67 | 57 |
|67. | NDB1442 | 07/12/2015 | 01/01/2017 | 02 | 13 | 46 | 46 | 68 | 68 | 58 |
|68. | NDB1414 | 15/01/2015 | 26/01/2017 | 02 | 13 | 45 | 45 | 67 | 67 | 59 |
|69. | NDB1448 | 20/01/2015 | 26/01/2017 | 12 | 03 | 35 | 35 | 68 | 68 | 57 |
|70. | NDB1452 | 26/12/2015 | 08/01/2017 | 13 | 12 | 37 | 37 | 68 | 68 | 68 |
|71. | NDB1456 | 26/12/2015 | 01/01/2017 | 12 | 13 | 46 | 46 | 58 | 68 | 68 |
|72. | NDB1459 | 26/12/2015 | 05/01/2017 | 01 | 12 | 37 | 37 | 58 | 67 | 67 |
|73. | NDB1461 | 26/12/2015 | 04/01/2017 | 12 | 13 | 45 | 45 | 57 | 67 | 67 |
|74. | NDB1465 | 15/12/2015 | 01/01/2017 | 01 | 12 | 36 | 36 | 59 | 67 | 67 |
|75. | NDB1467 | 27/12/2015 | 26/01/2017 | 01 | 12 | 34 | 34 | 58 | 68 | 68 |
|76. | NDB1473 | 24/12/2015 | 26/01/2017 | 02 | 12 | 36 | 36 | 67 | 67 | 57 |
|77. | NDB1474 | 05/12/2015 | 08/01/2017 | 02 | 12 | 35 | 35 | 67 | 67 | 58 |
|78. | NDB1477 | 05/12/2015 | 05/01/2017 | 13 | 02 | 34 | 34 | 68 | 58 | 58 |
|79. | NDB1486 | 04/12/2015 | 04/01/2017 | 12 | 12 | 45 | 46 | 68 | 68 | 67 |

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|   |         |         |         |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 80. | NDB1487 | 01/12/2015 | 01/01/2017 | 24 | 23 | 34 | 34 |
| 81. | NDB1488 | 26/12/2015 | 26/01/2017 | 23 | 23 | 36 | 37 |
| 82. | NDB1490 | 26/12/2015 | 26/01/2017 | 23 | 23 | 37 | 37 |
| 83. | NDB1492 | 08/12/2015 | 08/01/2017 | 01 | 02 | 34 | 34 |
| 84. | NDB1497 | 01/12/2015 | 01/01/2017 | 02 | 12 | 36 | 36 |
| 85. | NDB1571 | 08/12/2015 | 08/01/2017 | 13 | 12 | 35 | 35 |
| 86. | NDB1585 | 01/12/2015 | 01/01/2017 | 13 | 12 | 46 | 46 |

**C Susceptible**

|   |         |         |         |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 1. | RD 2632 | 04/12/2015 | 04/12/2016 | 13 | 13 | 58 | 56 |
| 2. | RD2637  | 01/12/2015 | 04/12/2016 | 13 | 14 | 47 | 47 |
| 3. | RD2640  | 02/12/2015 | 28/12/2016 | 12 | 24 | 56 | 45 |
| 4. | RD2657  | 05/12/2015 | 02/12/2016 | 14 | 13 | 46 | 46 |
| 5. | RD2661  | 01/12/2015 | 25/12/2016 | 02 | 25 | 48 | 48 |
| 6. | RD2640  | 01/12/2015 | 01/12/2016 | 13 | 24 | 46 | 57 |
| 7. | RD2657  | 20/12/2015 | 01/12/2016 | 12 | 12 | 67 | 58 |
| 8. | RD2661  | 21/12/2015 | 20/12/2016 | 13 | 12 | 57 | 59 |
| 9. | RD2665  | 30/11/2015 | 26/12/2016 | 12 | 13 | 58 | 56 |
| 10. | K675   | 01/12/2015 | 06/12/2016 | 14 | 24 | 59 | 67 |
| 11. | RD 2508 | 12/12/2015 | 01/12/2016 | 13 | 24 | 45 | 58 |
| 12. | RD2666  | 18/12/2015 | 22/12/2016 | 12 | 25 | 45 | 48 |
| 13. | RD2669  | 08/12/2015 | 28/12/2016 | 14 | 13 | 46 | 67 |
| 14. | RD2673  | 08/12/2015 | 28/12/2016 | 12 | 12 | 47 | 68 |
| 15. | RD 2674 | 08/12/2015 | 18/12/2016 | 14 | 12 | 58 | 68 |
| 16. | RD2676  | 05/12/2015 | 15/12/2016 | 12 | 13 | 57 | 67 |
| 17. | RD2655  | 28/11/2015 | 28/12/2016 | 13 | 24 | 56 | 56 |
| 18. | RD2658  | 28/11/2015 | 28/12/2016 | 12 | 13 | 67 | 46 |
| 19. | RD2660  | 20/11/2015 | 20/12/2016 | 13 | 12 | 68 | 67 |
| 20. | RD2675  | 18/11/2015 | 18/12/2016 | 14 | 24 | 67 | 56 |
| 21. | K824    | 26/11/2015 | 26/12/2016 | 25 | 25 | 56 | 58 |
| 22. | K603    | 25/11/2015 | 25/12/2016 | 24 | 23 | 56 | 57 |
| 23. | K782    | 25/12/2015 | 25/12/2016 | 12 | 23 | 57 | 56 |
| 24. | RD2685  | 25/12/2015 | 25/12/2016 | 12 | 12 | 67 | 58 |
| No. | Code   | Date 1     | Date 2     | Res 1 | Res 2 | Res 3 | Res 4 | Res 5 |
|-----|--------|------------|------------|-------|-------|-------|-------|-------|
| 25. | RD2687 | 28/12/2015 | 28/12/2016 | 13    | 13    | 68    | 67    | 78    | 78    |
| 26. | RD2692 | 01/11/2015 | 01/12/2016 | 14    | 12    | 56    | 68    | 89    | 89    |
| 27. | RD2693 | 24/11/2015 | 24/12/2016 | 24    | 24    | 47    | 67    | 89    | 89    |
| 28. | K829   | 27/12/2015 | 27/12/2016 | 13    | 25    | 45    | 67    | 78    | 89    |
| 29. | K832   | 25/12/2015 | 25/12/2016 | 25    | 12    | 46    | 68    | 78    | 89    |
| 30. | K835   | 24/12/2015 | 02/12/2016 | 24    | 13    | 48    | 58    | 89    | 79    |
| 31. | K836   | 01/12/2015 | 01/12/2016 | 12    | 13    | 57    | 47    | 78    | 79    |
| 32. | K837   | 25/12/2015 | 05/12/2016 | 12    | 13    | 58    | 56    | 89    | 78    |
| 33. | NDB1401| 28/12/2015 | 28/12/2016 | 13    | 12    | 59    | 46    | 89    | 78    |
| 34. | NDB1403| 28/12/2015 | 28/11/2016 | 24    | 14    | 56    | 48    | 89    | 79    |
| 35. | NDB1404| 26/12/2015 | 26/12/2016 | 24    | 02    | 67    | 46    | 78    | 89    |
| 36. | RD2686 | 27/11/2015 | 28/12/2016 | 25    | 13    | 58    | 67    | 79    | 89    |
| 37. | RD2700 | 27/11/2015 | 22/12/2016 | 13    | 12    | 48    | 57    | 78    | 78    |
| 38. | RD2702 | 21/11/2015 | 21/12/2016 | 12    | 13    | 67    | 58    | 79    | 79    |
| 39. | RD2703 | 18/11/2015 | 18/12/2016 | 12    | 12    | 68    | 59    | 79    | 79    |
| 40. | RD2705 | 13/11/2015 | 13/12/2016 | 13    | 14    | 68    | 45    | 89    | 78    |
| 41. | RD2706 | 18/11/2015 | 08/12/2016 | 24    | 13    | 67    | 45    | 79    | 78    |
| 42. | RD2707 | 22/11/2015 | 22/12/2016 | 13    | 12    | 56    | 46    | 79    | 89    |
| 43. | RD2709 | 23/11/2015 | 03/12/2016 | 12    | 14    | 46    | 47    | 78    | 78    |
| 44. | RD2710 | 23/12/2015 | 03/12/2016 | 24    | 12    | 67    | 58    | 78    | 79    |
| 45. | RD2712 | 22/12/2015 | 22/12/2016 | 25    | 14    | 56    | 57    | 79    | 78    |
| 46. | RD2713 | 25/12/2015 | 25/12/2016 | 23    | 12    | 58    | 56    | 78    | 89    |
| 47. | RD2715 | 20/12/2015 | 25/12/2016 | 23    | 13    | 57    | 67    | 79    | 78    |
| 48. | RD2716 | 08/12/2015 | 28/12/2016 | 12    | 12    | 56    | 68    | 79    | 79    |
| 49. | RD2718 | 08/12/2015 | 28/12/2016 | 13    | 13    | 58    | 67    | 78    | 89    |
| 50. | RD2721 | 12/12/2015 | 22/12/2016 | 12    | 14    | 67    | 56    | 78    | 78    |
| 51. | UPB2   | 02/12/2015 | 22/12/2016 | 24    | 25    | 68    | 56    | 89    | 78    |
| 52. | K826   | 12/12/2015 | 08/12/2016 | 25    | 24    | 67    | 57    | 89    | 89    |
| 53. | K827   | 20/12/2015 | 08/12/2016 | 12    | 12    | 67    | 67    | 89    | 78    |

D. Highly Susceptible
1. JB 122 16/11/2015 25/12/2016 35 35 68 67 89 89
2. Jyoti 25/11/1015 25/12/2016 35 35 68 67 89 89
**Table 3** Disease scores of Barley genotypes against Bipolaris sorokiniana during 2015-16 and 2016-17

| Sl. No. | Disease response | Double digit scale | Germplasm | No. of germplasm |
|---------|------------------|--------------------|-----------|-----------------|
| 1.      | Immune (I)       | 00-01              | Nil       |                 |
| 2.      | Resistant (R)    | 12-24              | Nil       |                 |
| 3.      | Moderately resistant (MR) | 34-46 | DWR46, DWR47 DWR 49, K861, K863, K878, K846, K868, NDB1413. | 9 |
| 4.      | Moderately Susceptible (MS) | 56-68 | RD2676, RD2670, BH648, BH657, HUB173, RD2035, RD2634, K729, RD2552, RD2668, NDB1245, K551, Lakhan, RD2624, K791, NDB1276, RD2696, UB181, HUB182, HUB182, HUB182, HUB106, K822, K823, K825, K830, NDB1319, NDB1402 , NDB1405, PL801, PL802, RD2701, RD2704, RD2708, RD2711, RD2714, RD2717, RD2719, RD2720, RD2722, UPB1, UPB4, JB123, JB126, JB127, JB129, JB134, K839, K853, K856, K857, K858, K859, K860K862, K864, K865, K866, NDB1411, NDB1412, NDB1414, NDB1417, NDB1418, NDB1419, NDB1420, NDB1173, NDB142, NDB1445, NDB1448, NDB1452, NDB1456, NDB1459, NDB1461, NDB1465, NDB1467, NDB1473, NDB1474, NDB1477, NDB1486, NDB1487, NDB1488, NDB1490, NDB1492, NDB1495, NDB1571, NDB1585 | 86 |
| 5.      | Susceptible (S)  | 78-89              | RD2632, RD2637, RD2640, RD2657, RD2661, RD2640, RD2657, RD2661, RD2665, K675, RD2508, RD2666, RD2669, RD2673, RD2674, RD2676, RD2655, RD2658, RD2660, RD2675, K603, K782, RD2685, RD2687, RD2692, RD2693, K824, K826, K827, K829, K832, K835, K836, K837, NDB1401, NDB1403, NDB1404, RD2686, RD2700, RD2702, RD2703, RD2705, RD2706, RD2707, RD2709, RD2710, RD2712, RD2713, RD2715, RD2716, RD2718, RD2721, UPB2 | 53 |
| 6.      | Highly Susceptible (HS) | 99 | Jyoti, JB122 | 2 |
Some of these were RD2676, RD2670, BH648, BH657, HUB173, RD2035, RD2634, K729, RD2552, RD2668, NDB1245, K551, Lakhan, RD2624, K791, NDB1276, RD2696, HUB181, HUB182, HUB182, HUB186, HUB106, K822, K823, K825, K830, NDB1319, NDB1402, NDB1405, PL801, PL802, RD2701, RD2704, RD2708, RD2711, RD2714, RD2717, RD2719, RD2720, RD2722, UPB1, UPB4, JB123, JB126, JB127, JB129, JB134, K839, K853, K856, K857, K858, K859, K860, K862, K864, K865, K866, NDB1411, NDB1412, NDB1414, NDB1417, NDB1418, NDB1419, DB1420, NDB1173, NDB142, NDB1445, NDB1448, NDB1452, NDB1456, NDB1459, NDB1461, NDB1465, NDB1467, NDB1473, NDB1474, NDB1477, NDB1486, NDB1487, NDB1488, NDB1490, NDB1492, NDB1495, NDB157, NDB1585, (score 56 - 68) (Table 3). While fifty-three genotypes were RD2632, RD2637, RD2640, RD2657, RD2661, RD2640, RD2657, RD2661, RD2656, K675, RD2508, RD2666, RD2669, RD2673, RD2674, RD2676, 6, RD2655, RD2658, RD2660, RD2675, K603, K782, RD2685, RD2687, RD2692, RD2693, K824, K826, K827, K829, K832, K835, K836, K837, NDB1401, NDB1403, NDB1404, RD2686, RD2700, RD2702, RD2703, RD2705, RD2706, RD2707, RD2709, RD2710, RD2712, RD2713, RD2715, RD2716, RD2718, RD2721, UPB2, susceptible (score 56 - 68) (Table -3) Two genotypes JB 122, Jyoti were highly susceptible (score -99).

Among one hundred fifty genotypes none was found free from the disease. Nine genotypes were moderately resistant, eighty-six moderately susceptible, fifty-five susceptible and two highly susceptible. Some workers have screened the barley genotypes/ lines against Bipolaris sorokiniana and reported variable level of resistance Murti et al., (2014) Screened 388 genotypes none was found free from the disease and resistant. One hundred fifty five genotypes were moderately resistant, one hundred sixty nine were moderately susceptible, sixty two were susceptible and rests two were found highly susceptible during the crop season. Misra (1973) tested 391 barley varieties; fifty of these proved very resistant, 97 very susceptible.

Thus screening of genotypes/ varieties/ lines conducted under natural field condition for their response towards spot blotch disease caused by Bipolaris sorokiniana is the best methodology to identify the resistant genotypes/ lines, selected for the commercial production of barley crop to protect the crop from diseases and subsequently increase the production.

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