Table：Seedling response of AVT lines against the pathotypes of Puccinia graminis f．sp．tritici（wheat black rust）during 2022－23 at ICAR－ IIWBR，RS，Shimla

| S． <br> No． | Variety／line | Pathotype |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Sr－genes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | こ | $\sqrt[3]{3}$ | $\pm$ | － | ה | $\begin{gathered} \text { N } \\ \underset{N}{4} \end{gathered}$ | $\begin{aligned} & \mathbb{1} \\ & \text { N } \end{aligned}$ | $\stackrel{\ddagger}{\ddagger}$ | $\underset{8}{4}$ | $\stackrel{\rightharpoonup}{\sigma}$ | $\stackrel{\text { ベ }}{\stackrel{1}{\circ}}$ | $\underset{\ominus}{\ominus}$ | $\begin{aligned} & \underset{\sim}{\sim} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & \mathbb{n} \\ & \end{aligned}$ | 年 | $\frac{7}{7}$ | $\stackrel{\text { N}}{ }$ | $\stackrel{?}{\boldsymbol{N}}$ | $$ | N | $\underset{\sim}{ \pm}$ | ๕ั |  |
| 1. | HS691 | S | S | MR | S | R | R | R | R | MR | R | MS | S | MS | R | R | R | S | R | R | R | R | R | －＊ |
| 2. | HS692 | MR | MR | R | S | R | R | R | R | R | R | MR | S | R | R | R | R | R | R | R | R | R | R | －＊ |
| 3. | VL3028 | R | R | R | MS | R | R | R | R | R | MS | S | MS | R | R | R | R | R | R | R | R | R | R | Sr30＋5＋11＋ |
| 4. | HPW484 | MS | S | R | S | R | R | R | R | R | S | R | S | MR | R | R | R | R | R | R | R | R | R | Sr30＋5＋11＋ |
| 5. | VL907（C） | R | R | R | MS | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | －＊ |
| 6. | VL892（C） | MS | R | R | MS | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | S | R | R | Sr30＋11＋ |
| 7. | HPW349（C） | MR | MR | R | S | R | R | R | R | R | MR | R | MS | R | R | R | R | R | R | R | R | R | R | Sr7b＋2＋ |
| 8. | HS562（C） | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr8a＋9b＋11＋ |
| 9. | VL2041（I）（C） | MR | R | R | R | R | R | R | R | R | S | R | S | R | R | R | R | R | R | R | R | R | R | Sr30＋5＋11＋ |
| 10. | PBW887 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 11. | PBW889 | S | R | R | MR | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr30＋5＋ |
| 12. | HD3386 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R＊ |
| 13. | HD3470 | R | MR | R | MR | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr5＋13＋7b＋ |
| 14. | HI1668 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31＋ |
| 15. | DBW386 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 16. | UP3102 | MR | S | R | S | R | R | R | R | R | R | MR | S | MR | R | R | R | R | R | R | R | R | R | Sr $5+9 b+7 b+$ |
| 17. | HD3428 | S | S | R | MS | R | R | R | R | R | R | S | S | MS | R | R | R | MS | MS | R | R | R | R | Sr13＋7b＋ |
| 18. | PBW893 | MR | R | R | MR | R | R | R | R | R | R | R | MR | R | R | R | R | MR | R | R | R | R | R | Sr13＋7b＋ |
| 19. | K2108 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31＋ |
| 20. | HD3059（C） | R | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr11＋2＋ |
| 21. | DBW173（C） | MS | MS | R | S | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr30＋2＋＊ |
| 22. | PBW771（C） | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R＊ |
| 23. | JKW261（C） | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr11＋ |
| 24. | WH1402 | MS | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr30＋5＋＊ |
| 25. | WH1311 | R | R | R | MS | R | R | R | R | R | R | R | SR | R | R | R | R | R | R | R | R | R | R | Sr30＋5＋ |
| 26. | UP3111 | S | R | R | NG | R | R | R | R | R | R | R | MS | R | R | NG | NG | R | MR | R | R | R | R | Sr13＋9b＋11＋ |
| 27. | PBW899 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 28. | PBW644（C） | MR | R | R | S | R | R | R | R | R | R | R | S | MR | R | R | R | R | R | R | R | R | R | Sr11＋2＋ |
| 29. | DBW296（C） | R | R | R | R | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr13＋7b＋ |
| 30. | HD3369（I）（C） | R | R | R | R | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr13＋ |
| 31. | HI1653（I）（C） | R | R | R | S | R | R | R | R | MR | R | R | S | R | R | R | R | R | R | R | R | R | R | Sr7b＋ |
| 32. | HI1654（I）（C） | S | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr13＋ |
| 33. | HD3388 | MR | R | R | S | R | R | R | R | R | S | R | S | R | R | R | R | R | R | R | R | R | R | Sr13＋7b＋ |
| 34. | HD3471 | S | S | R | S | R | R | R | R | MR | S | S | S | S | MR | R | R | S | MS | R | R | R | R | Sr7b＋ |
| 35. | HD3249（C） | S | S | R | S | R | R | R | MR | R | S | R | S | S | R | R | R | R | S | R | R | R | NG | Sr7b＋2＋＊ |
| 36. | HD3086（C） | R | R | R | MR | R | R | R | R | R | R | MS | S | MS | R | R | R | R | R | R | R | R | R | Sr7b＋2＋ |
| 37. | HD2967（C） | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr8a＋11＋2＋ |
| 38. | DBW222（C） | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R＊ |
| 39. | PBW826（I）（C） | R | R | R | R | R | R | R | R | R | R | MS | MS | R | R | R | R | R | R | R | R | R | R | Sr30＋8a＋2＋ |
| 40. | DBW398 | MR | S | R | MS | R | R | R | R | R | R | S | MS | R | R | R | R | MR | R | R | R | R | R | Sr9b＋7b＋ |
| 41. | HI1612（C） | S | R | R | R | R | R | R | R | R | R | R | MR | R | NG | R | R | S | NG | R | R | R | R | Sr7b＋2＋ |


| 42. | K1317(C) | MR | S | R | S | R | R | R | R | R | S | R | R | R | R | R | R | MR | R | R | R | R | R | -* |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 43. | HD3171(C) | R | MR | R | MR | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr11+7b+2+ |
| 44. | HD3293(C) | S | R | R | S | R | R | R | R | R | R | R | MR | R | R | R | R | R | MR | R | R | R | R | Sr13+2+ |
| 45. | DBW252(C) | S | MR | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | MS | R | R | Sr8a+5+11+2+ |
| 46. | NWS2194 | S | S | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | Sr30+11+ |
| 47. | HI1669 | R | R | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | Sr8b+9e+ |
| 48. | HI1670 | MR | R | R | S | R | R | R | R | MR | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr9b+7b+ |
| 49. | GW547 | MR | R | R | MR | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | MR | R | R | R | Sr30+* |
| 50. | GW513(C) | MR | S | R | MS | R | R | R | R | R | R | R | MR | MR | R | R | R | MR | R | R | R | MR | R | -* |
| 51. | HI1636 (C) | R | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr24+2+ |
| 52. | HI1650(I)(C) | R | R | R | R | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | -* |
| 53. | MACS6768(I)(C) | MR | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | -* |
| 54. | HI1674 | MR | MS | R | R | R | R | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | Sr9b+7b+2+ |
| 55. | AKAW5104 | S | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | MR | R | R | Sr13+8b+7b+ |
| 56. | HD2932(C) | MR | MS | R | R | R | R | MS | R | MR | R | R | MR | S | R | R | R | R | R | R | R | R | R | Sr11+ |
| 57. | MP4010(C) | MR | R | R | MS | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | -* |
| 58. | HI1634(C) | R | R | R | S | R | R | R | R | R | MR | R | S | R | R | R | R | R | R | R | R | R | R | -* |
| 59. | CG1029(C) | R | R | NG | R | R | R | R | R | R | R | R | S | R | R | R | R | R | MS | MS | R | R | R | -* |
| 60. | DBW359 | R | R | R | R | R | R | R | R | R | R | R | R | S | R | R | R | MR | R | R | R | R | R | Sr9b+7b+ |
| 61. | DBW441 | MS | S | R | S | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr13+9b+7b+ |
| 62. | DBW442 | R | R | R | R | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr5+30+ |
| 63. | CG1040 | R | R | R | R | R | R | NG | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 64. | MP3288(C) | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr24+ |
| 65. | DBW110(C) | R | R | R | S | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | -* |
| 66. | CG1036(I)(C) | MS | S | R | S | R | R | R | R | R | R | MR | MS | MS | R | MR | R | R | R | R | MR | R | R | Sr7b+2+ |
| 67. | HI1655(I)(C) | MR | R | R | S | R | R | R | R | R | R | R | MR | S | R | R | R | MR | R | R | R | R | R | -* |
| 68. | UAS3020 | S | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | Sr13+9b+7b+ |
| 69. | UAS3021 | S | S | R | MS | R | R | R | R | R | MR | R | S | MR | R | R | R | MS | R | R | R | R | R | Sr13+7b+ |
| 70. | MACS6811 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31+ |
| 71. | MACS6809 | MS | S | R | R | R | MS | R | R | R | R | S | S | R | R | R | R | S | MS | R | S | R | R | Sr13+9b+7b+ |
| 72. | NIAW4183 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 73. | NIAW4153 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31+ |
| 74. | AKAW5314 | R | R | R | R | R | R | R | R | R | MR | R | S | R | R | R | R | R | R | R | R | R | R | Sr5+30+ |
| 75. | AKAW5100 | R | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr5+30+ |
| 76. | MP1378 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R* |
| 77. | MP1386 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31+ |
| 78. | DBW443 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31+ |
| 79. | DBW444 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 80. | HD3469 | R | R | NG | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | R | Sr5+30+ |
| 81. | NWS2222 | R | R | R | MR | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr30+ |
| 82. | PWU15 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 83. | WH1306 | R | R | R | MS | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr5+30+ |
| 84. | PBW891 | MR | R | R | S | R | R | R | R | S | R | MR | MR | R | R | R | R | R | R | R | MR | R | R | Sr9b+7b+ |
| 85. | HI8841(d) | R | R | R | S | R | R | R | R | R | R | MR | S | R | R | R | R | R | R | R | R | R | R | Sr9e $+7 b+$ |
| 86. | UP3083 | R | R | R | MS | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | - |
| 87. | MACS3949(d)(C) | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | R | R | Sr7b+2+ |
| 88. | HI8826(d)(I)(C) | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R* |
| 89. | MACS4100(d)(I)(C) | R | R | R | R | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | - |
| 90. | MACS6222 (C) | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr24+R |
| 91. | HI1672 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr31+ |


| 92. | HI1673 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 93. | HI1675 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 94. | DBW394 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 95. | DBW395 | R | R | R | S | R | R | R | R | MR | R | MR | MR | R | R | R | R | R | R | R | R | R | R | Sr8b+9e+7b+ |
| 96. | MACS6814 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 97. | MACS6805 | S | R | R | R | R | R | R | R | S | R | R | R | MR | R | R | R | R | MR | R | S | R | R | Sr9b+11+7b+ |
| 98. | NIAW4114 | MS | R | R | MS | R | R | R | R | R | R | R | MS | R | R | R | R | R | MR | R | R | R | R | Sr9b+11+7b+ |
| 99. | NIAW4120 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 100. | UAS3022 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 101. | UAS3023 | S | R | R | MS | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr13+11+7b+ |
| 102 | MP3557 | S | R | R | R | R | R | R | R | R | R | R | MR | R | R | R | R | R | MS | R | R | R | R | Sr13+11+9b+ |
| 103. | MP3556 | MR | R | R | S | R | R | MR | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr13+11+7b+ |
| 104. | PBW897 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 105. | MP1388 | R | S | R | S | R | R | R | R | R | R | R | MS | R | R | R | R | R | MR | R | R | R | R | Sr13+9b+7b+ |
| 106. | GW542 | R | R | R | R | MR | R | R | R | MR | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr7b+ |
| 107. | GW538 | MR | R | R | S | R | R | R | R | MR | MR | R | S | R | R | R | R | R | R | R | R | R | R | Sr9b+7b+ |
| 108. | WH1310 | R | R | R | R | R | R | R | R | MR | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr7b $+2+$ |
| 109. | LOK79 | MS | R | R | MR | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | Sr9b+7b+ |
| 110. | RAJ4083(C) | R | R | R | MS | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | Sr11+ |
| 111. | HD3090(C) | S | S | R | S | R | R | MS | R | MR | MS | MS | MS | MS | MR | MS | R | MR | MS | MS | MS | R | MR | -* |
| 112. | HI1633(C) | S | R | R | MR | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | MR | R | R | -* |
| 113. | UAS478(d) | S | S | R | S | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | R | R | Sr7b+2+ |
| 114. | UAS481(d) | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 115. | HI1665 | MS | R | R | S | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | R | R | R | R | R* |
| 116. | HI8840(d) | S | R | R | R | R | R | R | R | R | R | R | MS | R | R | R | R | R | S | R | R | R | MS | Sr13+7b+ |
| 117. | DBW397 | MS | R | R | MS | R | R | R | R | MR | R | R | MS | R | R | R | R | R | MS | R | R | R | R | Sr13+9b+7b+ |
| 118. | DDW61(d) | MR | MR | R | S | R | R | R | R | R | R | MS | S | R | R | R | R | R | R | R | S | R | MS | Sr9b+7b+ |
| 119. | NIAW4028 | MR | R | R | S | R | R | R | R | S | MR | R | S | R | R | R | R | R | R | R | R | R | MR | Sr5+30+2+ |
| 120. | HI1605(C) | R | R | R | S | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | Sr11+ |
| 121. | NIAW3170(C) | MS | R | R | S | R | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | Sr8a+2+ |
| 122. | UAS446(d)(C) | R | R | R | S | R | R | R | R | R | R | R | R | R | R | R | R | R | R | MS | R | R | MR | Srll+2+ |
| 123. | NIDW1149(d)(C) | R | R | R | S | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | Sr11+2+ |
| 124. | DBW380 | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 125. | DBW370(I)(C) | S | S | R | MR | R | MR | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | Sr7b+ |
| 126. | DBW371(I)(C) | R | R | R | S | R | R | R | S | S | MR | R | MR | R | R | MR | R | R | R | R | R | R | R | Sr8a+2+ |
| 127. | DBW372(I)(C) | S | S | R | S | R | R | R | R | R | R | R | MS | R | R | R | R | R | R | MR | R | R | R | Sr28+ |
| 128. | PBW872(I)(C) | S | R | R | S | R | R | R | R | R | R | R | S | R | R | R | R | R | MR | R | R | R | R | -* |
| 129. | DBW377 | R | R | R | R | R | R | R | R | R | R | R | S | R | R | R | R | R | R | R | R | R | R | R |
| 130. | CG1044 | R | S | R | R | R | R | R | R | MR | R | R | R | R | R | R | R | R | R | R | R | R | R | Sr9b+7b+ |
| 131. | GW543 | S | S | R | R | R | R | R | R | R | MS | R | MS | MS | R | R | R | R | R | R | R | R | R | Sr7b+ |
| 132. | DBW187(C) | S | S | R | MS | R | R | R | R | R | S | S | MR | R | R | R | R | R | R | R | R | R | R | Sr5+11+ |
| 133. | DBW303(C) | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| 134. | GW322(C) | R | R | R | S | R | R | R | R | R | S | S | MR | R | R | R | R | R | R | R | R | R | R | Sr11+2+ |

