**Table S1** Summary of cluster analysis for 318 dry bean accessions based on eight agronomic traits

|  |  |  |
| --- | --- | --- |
| Clusters | No. of accessions | Accessions code |
| 1 | 253 | G30 G155 G188 G55 G185 G220 G200 G189 G140 G196 G313 G228 G246 G138 G192 G19 G179 G40 G161 G184 G197 G223 G204 G18 G142 G248 G62 G61 G203 G5 G186 G218 G139 G258 G260 G65 G100 G102 G273 G165 G254 G231 G272 G42 G255 G22 G175 G199 G87 G256 G252 G262 G250 G187 G243 G56 G84 G103 G82 G224 G205 G126 G301 G83 G167 G53 G169 G51 G154 G79 G148 G21 G141 G164 G74 G276 G166 G176 G241 G52 G27 G157 G181 G101 G26 G198 G97 G136 G226 G213 G14 G180 G25 G128 G156 G23 G105 G130 G191 G36 G77 G107 G158 G147 G69 G193 G247 G45 G214 G206 G190 G219 G275 G134 G201 G59 G163 G150 G308 G110 G35 G24 G66 G137 G195 G225 G211 G129 G293 G294 G304 G3 G16 G297 G131 G50 G307 G233 G132 G182 G242 G227 G290 G48 G86 G121 G261 G235 G318 G291 G135 G249 G300 G292 G209 G303 G113 G116 G63 G58 G133 G88 G106 G64 G312 G12 G8 G78 G57 G178 G217 G257 G41 G229 G54 G172 G251 G173 G104 G49 G118 G311 G183 G278 G309 G94 G264 G108 G266 G112 G302 G67 G269 G151 G170 G145 G119 G39 G253 G60 G80 G32 G4 G146 G174 G263 G221 G162 G144 G20 G171 G98 G244 G29 G280 G274 G95 G160 G127 G259 G295 G265 G73 G287 G90 G143 G91 G96 G149 G305 G207 G271 G71 G177 G43 G109 G46 G239 G230 G279 G114 G10 G6 G153 G222 G120 G277 G124 G216 G310 G298 G89 G152 |
| 2 | 8 | G236 G237 G238 G81 G37 G316 G70 G31 |
| 3 | 7 | G208 G215 G212 G1 G2 G281 G283 |
| 4 | 5 | G72 G210 G168 G194 G13 |
| 5 | 8 | G15 G33 G314 G315 G285 G288 G284 G282 |
| 6 | 5 | G68 G270 G11 G234 G44 |
| 7 | 4 | G92 G122 G47 G111 |
| 8 | 3 | G123 G317 G85 |
| 9 | 5 | G289 G299 G306 G159 G286 |
| 10 | 3 | G34 G232 G117 |
| 11 | 2 | G75 G125 |
| 12 | 3 | G17 G202 G240 |
| 13 | 4 | G245 G267 G99 G93 |
| 14 | 2 | G38 G76 |
| 15 | 1 | G7 |
| 16 | 1 | G9 |
| 17 | 1 | G28 |
| 18 | 1 | G115 |
| 19 | 1 | G268 |
| 20 | 1 | G296 |

**Table S2** PCA components and their Eigen values, % variance, and cumulative variance

|  |  |  |  |
| --- | --- | --- | --- |
| PC Components | Eigenvalue | Variance % | Cumulative variance% |
| PC1 | 2.20 | 27.51 | 27.51 |
| PC2 | 1.80 | 22.53 | 50.04 |
| PC3 | 1.07 | 13.43 | 63.47 |
| PC4 | 0.96 | 11.94 | 75.41 |
| PC5 | 0.72 | 8.94 | 84.35 |
| PC6 | 0.66 | 8.29 | 92.64 |
| PC7 | 0.38 | 4.75 | 97.40 |
| PC8 | 0.21 | 2.60 | 100.00 |

**Table S3** Estimates of BCMV percent disease incidence (PDI) and seed yield (Kg/ha) during three consecutive years (2016-2018) at two locations

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Season &Year | Winter 2016 | | Winter 2017 | | Rainy 2017 | | Winter 2018 | | Rainy 2018 | | | Average PDI over three years | Overall Disease Reaction | Average seed yield (Kg/ha) over three years |
| Locations | IIPR, Kanpur | | IIPR, Kanpur | | NBPGR, RS, Shimla | | IIPR, Kanpur | | NBPGR, RS, Shimla | | |
| Accession No. | PDI | SY (Kg/ha) | PDI | SY (Kg/ha) | PDI | SY (Kg/ha) | PDI | SY (Kg/ha) | PDI | SY (Kg/ha) |  | |  |  |
| IC361279 | 25.30 | 1236 | 35.00 | 915 | 15.3 | 1426 | 35.00 | 1526 | 25.0 | 1512 | 27.1 | | S | 1323 |
| IC382655 | 32.20 | 678 | 34.38 | 619 | 18.8 | 1526 | 23.53 | 1023 | 9.1 | 1081 | 23.6 | | S | 985 |
| IC419784 | 25.60 | 428 | 22.00 | 844 | 25.0 | 1236 | 20.83 | 963 | 8.0 | 733 | 20.3 | | MS | 841 |
| IC340911 | 12.30 | 738 | 3.85 | 948 | 56.3 | 1589 | 28.57 | 896 | 19.2 | 867 | 24.0 | | S | 1007 |
| IC391581 | 6.30 | 1391 | 8.00 | 815 | 6.3 | 1756 | 27.78 | 1706 | 4.3 | 407 | 10.5 | | MS | 1215 |
| IC341051 | 22.30 | 1508 | 17.74 | 704 | 0.0 | 1236 | 65.38 | 406 | 0.0 | 319 | 21.1 | | S | 834 |
| IC356011 | 20.30 | 447 | 16.67 | 530 | 93.8 | 478 | 21.15 | 1036 | 35.7 | 470 | 37.5 | | HS | 592 |
| IC341435 | 15.60 | 384 | 12.50 | 485 | 53.6 | 950 | 10.23 | 1294 | 4.5 | 569 | 19.3 | | MS | 736 |
| IC356024 | 30.30 | 665 | 25.00 | 589 | 13.4 | 1456 | 50.00 | 459 | 10.5 | 641 | 25.8 | | S | 762 |
| IC361279 | 8.60 | 664 | 10.87 | 963 | 92.9 | 1967 | 35.00 | 1026 | 14.3 | 3081 | 32.3 | | HS | 1540 |
| IC392636 | 22.30 | 704 | 20.37 | 2263 | 31.3 | 1028 | 55.88 | 1156 | 7.7 | 1185 | 27.5 | | S | 1267 |
| IC340920 | 15.60 | 614 | 17.39 | 444 | 32.5 | 1072 | 23.33 | 7563 | 35.7 | 648 | 24.9 | | S | 2068 |
| IC360831 | 0.00 | 2896 | 0.00 | 3023 | 0.0 | 3256 | 0.00 | 2652 | 0.0 | 2638 | 0.0 | | HR | 2893 |
| IC338795 | 25.30 | 793 | 21.88 | 856 | 13.4 | 1933 | 37.50 | 1236 | 15.4 | 1381 | 22.7 | | S | 1240 |
| ET4515 | 0.00 | 2563 | 0.00 | 2236 | 0.0 | 2122 | 0.00 | 2014 | 0.0 | 2012 | 0.0 | | HR | 2189 |
| EC150250 | 0.00 | 2013 | 0.00 | 2236 | 0.0 | 2228 | 0.00 | 1896 | 1.2 | 1889 | 0.2 | | HR | 2052 |
| IC341339 | 63.20 | 1033 | 76.67 | 856 | 72.9 | 1569 | 54.84 | 856 | 0.0 | 352 | 53.5 | | HS | 933 |
| IC340947 | 0.00 | 3025 | 0.00 | 2853 | 0.0 | 3256 | 0.00 | 2900 | 0.0 | 2896 | 0.0 | | HR | 2986 |
| GPR203 | 15.60 | 496 | 2.00 | 485 | 43.8 | 623 | 11.67 | 1256 | 0.0 | 481 | 14.6 | | MS | 668 |
| IC261277 | 12.30 | 1707 | 10.00 | 1263 | 37.5 | 2367 | 63.04 | 1878 | 0.0 | 459 | 24.6 | | S | 1535 |
| BLF101 | 0.00 | 753 | 0.00 | 326 | 1.6 | 1896 | 3.22 | 2889 | 0.0 | 1896 | 1.0 | | HR | 1552 |
| IC356008 | 6.30 | 1543 | 4.35 | 352 | 0.0 | 563 | 20.83 | 1039 | 4.8 | 563 | 7.3 | | R | 812 |
| IC356051 | 12.30 | 1312 | 9.26 | 2512 | 0.0 | 504 | 16.67 | 950 | 19.2 | 459 | 11.5 | | MS | 1147 |
| IC417350 | 10.30 | 1274 | 0.00 | 1556 | 0.0 | 2128 | 27.50 | 2256 | 33.3 | 1078 | 14.2 | | MS | 1658 |
| EC564795 | 22.30 | 1395 | 21.74 | 596 | 37.5 | 1856 | 27.40 | 2015 | 0.0 | 370 | 21.8 | | S | 1247 |
| IC393166 | 31.20 | 1555 | 34.38 | 1189 | 66.7 | 2756 | 26.00 | 1306 | 0.0 | 489 | 31.7 | | HS | 1459 |
| IC360865 | 22.30 | 690 | 32.00 | 633 | 13.4 | 856 | 23.80 | 1569 | 37.0 | 878 | 25.7 | | S | 925 |
| EC541703 | 32.60 | 472 | 48.08 | 593 | NP | 0 | 26.09 | 1256 | 35.7 | 304 | 35.6 | | MHS | 656 |
| EC565693 | 1.30 | 1389 | 0.00 | 1100 | 0.0 | 1783 | 16.67 | 1311 | 1.2 | 1569 | 3.8 | | HR | 1431 |
| IC391488 | 50.00 | 870 | 13.64 | 915 | NP | 0 | 6.25 | 1459 | 0.0 | 1245 | 17.5 | | MS | 1122 |
| IC341346 | 0.00 | 448 | 57.14 | 896 | 57.1 | 1567 | 16.66 | 1789 | 20.0 | 552 | 30.2 | | S | 1050 |
| NO3160A | 0.00 | 469 | 50.00 | 856 | 25.0 | 1067 | 19.67 | 1694 | 8.7 | 1005 | 20.7 | | S | 1018 |
| IC564797 | 87.50 | 459 | 4.00 | 344 | 94.4 | 978 | 5.00 | 1578 | 43.5 | 896 | 46.9 | | HS | 851 |
| EC500232 | 50.00 | 538 | 8.70 | 789 | 55.6 | 1450 | 27.74 | 744 | 55.6 | 1025 | 39.5 | | HS | 909 |
| IC340848 | 14.29 | 1404 | 13.16 | 796 | 15.5 | 900 | 25.00 | 963 | 4.3 | 1589 | 14.5 | | MS | 1131 |
| IC419767 | 85.71 | 561 | 30.56 | 848 | 69.0 | 1478 | 12.07 | 400 | 4.3 | 1496 | 40.3 | | HS | 957 |
| IC338730 | 25.00 | 392 | 10.00 | 600 | 63.5 | 1406 | 5.56 | 1428 | 38.5 | 963 | 28.5 | | S | 958 |
| IC356063 | 22.22 | 310 | 8.33 | 422 | 100.0 | 872 | 5.88 | 2172 | 57.7 | 789 | 38.8 | | HS | 913 |
| ET84490 | 100.00 | 443 | 2.17 | 504 | 78.8 | 896 | 7.89 | 2015 | 3.8 | 1489 | 38.5 | | HS | 1069 |
| EC564797B | 12.50 | 623 | 4.35 | 856 | 100.0 | 2122 | 5.35 | 2236 | 4.5 | 1896 | 25.3 | | S | 1547 |
| IC356057 | 85.71 | 375 | 31.58 | 670 | 75.0 | 1722 | 13.64 | 1528 | 30.0 | 1236 | 47.2 | | HS | 1106 |
| IC360868 | 62.50 | 425 | 20.83 | 1209 | 28.6 | 1263 | 11.54 | 1523 | 43.5 | 863 | 33.4 | | HS | 1057 |
| NO3107 | 83.33 | 322 | 29.41 | 1481 | 88.9 | 828 | 15.79 | 1378 | 55.6 | 667 | 54.6 | | HS | 935 |
| IC25537 | 28.57 | 865 | 0.00 | 1569 | 1.3 | 2389 | 32.56 | 1828 | 0.0 | 2356 | 12.5 | | MS | 1801 |
| IC400401 | 37.50 | 1406 | 2.94 | 848 | 62.5 | 1650 | 9.37 | 2145 | 3.8 | 896 | 23.2 | | S | 1389 |
| EC14920 | 37.50 | 344 | 15.22 | 967 | 29.2 | 694 | 11.10 | 2133 | 10.0 | 1415 | 20.6 | | S | 1111 |
| IC3613493 | 0.00 | 534 | 17.31 | 700 | 75.0 | 789 | 11.54 | 1256 | 0.0 | 659 | 20.8 | | S | 788 |
| IC417353 | 0.00 | 804 | 12.50 | 404 | 68.8 | 1656 | 30.95 | 1248 | 87.0 | 968 | 39.9 | | HS | 1016 |
| IC341404 | 0.00 | 661 | 8.33 | 841 | 40.2 | 1506 | 18.52 | 2194 | 36.0 | 1296 | 20.6 | | S | 1300 |
| ET8409 | 0.00 | 1454 | 1.67 | 704 | 1.2 | 1844 | 12.36 | 2147 | 1.3 | 1896 | 3.3 | | HR | 1609 |
| IC417352 | 37.50 | 1344 | 4.41 | 1019 | 0.0 | 483 | 30.12 | 1211 | 36.4 | 1456 | 21.7 | | S | 1103 |
| IC338701 | 66.67 | 1638 | 50.00 | 837 | 0.0 | 694 | 20.92 | 2215 | 4.0 | 896 | 28.3 | | S | 1256 |
| IC340870 | 12.50 | 457 | 31.25 | 1823 | 32.6 | 500 | 36.84 | 2014 | 30.8 | 541 | 28.8 | | S | 1067 |
| IC360823 | 12.30 | 521 | 50.00 | 1541 | 35.6 | 1189 | 15.09 | 2263 | 17.4 | 656 | 26.1 | | S | 1234 |
| IC421997 | 0.00 | 1603 | 44.74 | 1096 | 35.6 | 1350 | 36.36 | 1203 | 20.8 | 789 | 27.5 | | S | 1208 |
| IC337291 | 12.40 | 1716 | 73.08 | 389 | 42.4 | 589 | 69.23 | 563 | 26.3 | 1289 | 44.7 | | HS | 909 |
| GPR118A | 57.14 | 1241 | 31.25 | 785 | 26.3 | 1025.0 | 26.67 | 896 | 15.6 | 689 | 31.4 | | HS | 927 |
| EC540173 | 12.50 | 1508 | 23.08 | 329 | 30.2 | 1269.0 | 19.23 | 895 | 22.3 | 444 | 21.5 | | S | 889 |
| IC340925 | 100.00 | 856 | 50.00 | 533 | 63.2 | 896.0 | 46.15 | 785 | 32.3 | 859 | 58.3 | | HS | 786 |
| IC383620 | 55.56 | 752 | 92.50 | 428 | 89.6 | 896.0 | 47.50 | 569 | 22.3 | 1281 | 61.5 | | HS | 785 |
| IC341342 | 14.29 | 1123 | 75.00 | 356 | 63.2 | 856.0 | 35.71 | 485 | 10.2 | 2544 | 39.7 | | HS | 1073 |
| IC361356 | 66.67 | 623 | 60.71 | 562 | 55.3 | 456.0 | 14.23 | 869 | 32.5 | 1696 | 45.9 | | HS | 841 |
| IC383412 | 71.43 | 1023 | 43.75 | 852 | 42.3 | 1236.0 | 20.83 | 562 | 12.5 | 607 | 38.2 | | HS | 856 |
| IC317403 | 100.00 | 963 | 35.71 | 456 | 25.3 | 896.0 | 6.25 | 1236 | 32.5 | 807 | 40.0 | | HS | 872 |
| IC356026 | 87.50 | 562 | 38.46 | 523 | 36.2 | 1024.0 | 46.15 | 856 | 10.5 | 1236 | 43.8 | | HS | 840 |
| IC341386 | 100.00 | 623 | 60.00 | 652 | 56.2 | 1124.0 | 17.57 | 1236 | 18.3 | 896 | 50.4 | | HS | 906 |
| IC430037 | 75.00 | 658 | 57.69 | 542 | 62.3 | 548.0 | 50.00 | 562 | 35.6 | 648 | 56.1 | | HS | 592 |
| IC356062 | 28.57 | 723 | 23.33 | 441 | 54.3 | 632.0 | 12.50 | 1245 | 66.2 | 444 | 37.0 | | HS | 697 |
| IC280817 | 77.78 | 1423 | 70.00 | 385 | 51.3 | 745.0 | 58.33 | 589 | 10.2 | 1944 | 53.5 | | HS | 1017 |
| IC383613 | 75.00 | 658 | 30.77 | 356 | 56.2 | 852.0 | 25.30 | 1236 | 22.3 | 1236 | 41.9 | | HS | 868 |
| IC341340 | 62.50 | 523 | 52.27 | 511 | 36.2 | 796.0 | 23.53 | 1045 | 15.3 | 2119 | 38.0 | | HS | 999 |
| Jawala SC) | 75.30 | 723 | 56.30 | 856 | 56.2 | 852.0 | 38.24 | 1596 | 45.6 | 1852 | 54.3 | | HS | 1176 |
| Uday (SC) | 62.50 | 1356 | 70.45 | 1236 | 63.2 | 963.0 | 56.20 | 1756 | 36.5 | 648 | 57.8 | | HS | 1192 |
| Arun (RC) | 1.20 | 2036 | 0.00 | 1896 | 0.0 | 2365.0 | 0.00 | 2263 | 0.0 | 2056 | 0.2 | | HR | 2123 |
| Amber (RC) | 0.00 | 2258 | 0.00 | 1785 | 0.0 | 2145.0 | 0.00 | 2459 | 0.0 | 2269 | 0.0 | | HR | 2183 |
| Min | 0.0 | 310.0 | 0.0 | 326.0 | 0.0 | 456.0 | 0.0 | 400.0 | 0.0 | 304.0 |  | |  |  |
| Max | 100.0 | 3025.0 | 92.5 | 3023.0 | 100.0 | 3256.0 | 69.2 | 2900.0 | 87.0 | 3081.0 |  | |  |  |
| Mean | 33.8 | 999.8 | 26.0 | 3023.0 | 39.3 | 1327.0 | 24.1 | 1414.6 | 18.8 | 1151.0 |  | |  |  |

**Note:** Based on PDI values at 55 DAS & 95 DAS, SC, Susceptible check, RC, Resistant check, HR, Highly resistant; R, Resistant; MS, moderately susceptible; S, susceptible; HS, highly susceptible

**Figure S1** Principal component analysis (PCA) of the 318 dry bean accessions and the first and second principal components accounting for 50 % of the total variance

