**Supplementary Material**

**Table S1.** Response of landraces against PSTv races. **a:** Resistant, **b:** Moderately resistant, **c:** Moderately susceptible, **d:** Susceptible

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PSTv races** | **R** | **MR** | **MS** | **S** |
| **574730** | 9 | 13 | 3 | 0 |
| **574212** | 12 | 13 | 0 | 0 |
| **574232** | 8 | 14 | 2 | 1 |
| **574216** | 3 | 14 | 8 | 0 |
| **410202** | 7 | 18 | 0 | 0 |
| **430220** | 18 | 7 | 0 | 0 |
| **476232** | 17 | 8 | 0 | 0 |

**Table S2.** US Puccinia striiformis f. sp. tritici (Pst) races used to screen PI388222 x Avocet ‘S’ population (Octal code and virulence/avirulence formulae was based on methods of Wan and Chen 2014).

|  |  |  |
| --- | --- | --- |
| **PSTv race** | **Octal code** | **Virulence/Avirulence formula** |
| **PSTv-37** | 171266 | 6,7,8,9,17,27,43,44,Tr1,Exp2/1,5,10,15,24,32,SP,Tye |
| **PSTv-40** | 174766 | 6,7,8,9,10,24,27,32,43,44,Tr1,Exp2/1,5,15,17,SP,Tye |
| **PSTv-4** | 511211 | 1,6,9,17,27,SP,Tye/5,7,8,10,15,24,32,43,44,Tr1,Exp2 |
| **PSTv-51** | 575777 | 1,6,7,8,9,10,17,24,27,32,43,44,SP,Tr1,Exp2,Tye/5,15 |

**Table S3.** Seedling reaction adult plant reaction, final rust severity and coefficient of infection to stripe rust and AUDPC in F5 RIL population PI 388222 x Avocet ‘S’ in two locations. **a: Adult plant reaction, b: Final rust severity, c: Area under disease progress, d: relative Area under disease progress**

| **Pullman Field Results** | | | |  | |  | | **Mount Vernon Field Results** | | |  | | |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **RILs** | **APRa** | **FRSb** | **AUDPCc** | | **rAUDPCd** | | **RILs** | **APRa** | **FRSb** | **AUDPCc** | | **rAUDPCd** |
| 1 | R | 15 | 156 | | 11 | | 1 | R | 30 | 665 | | 37 |
| 2 | R | 5 | 153 | | 11 | | 2 | R | 20 | 475 | | 26 |
| 3 | R | 40 | 240 | | 17 | | 3 | R | 60 | 380 | | 21 |
| 4 | MR | 5 | 267 | | 19 | | 4 | MR | 30 | 760 | | 42 |
| 5 | R | 70 | 189 | | 13 | | 5 | R | 40 | 380 | | 21 |
| 6 | M | 80 | 275 | | 19 | | 6 | S | 80 | 665 | | 37 |
| 7 | M | 5 | 655 | | 46 | | 7 | S | 80 | 1520 | | 84 |
| 8 | R | 5 | 157 | | 11 | | 8 | R | 10 | 190 | | 11 |
| 9 | R | 5 | 136 | | 9 | | 9 | R | 40 | 143 | | 8 |
| 10 | R | 5 | 174 | | 12 | | 10 | R | 30 | 475 | | 26 |
| 11 | R | 5 | 116 | | 8 | | 11 | R | 20 | 380 | | 21 |
| 12 | R | 5 | 77 | | 5 | | 12 | R | 20 | 285 | | 16 |
| 13 | R | 15 | 156 | | 11 | | 13 | R | 20 | 285 | | 16 |
| 14 | MR | 10 | 158 | | 11 | | 14 | MR | 60 | 380 | | 21 |
| 15 | R | 5 | 136 | | 9 | | 15 | R | 10 | 190 | | 11 |
| 16 | R | 5 | 119 | | 8 | | 16 | R | 10 | 190 | | 11 |
| 17 | R | 5 | 119 | | 8 | | 17 | R | 30 | 190 | | 11 |
| 18 | R | 5 | 137 | | 10 | | 18 | R | 10 | 380 | | 21 |
| 19 | R | 5 | 150 | | 10 | | 19 | R | 20 | 190 | | 11 |
| 20 | R | 5 | 95 | | 7 | | 20 | R | 10 | 285 | | 16 |
| 21 | R | 5 | 244 | | 17 | | 21 | R | 20 | 190 | | 11 |
| 22 | R | 5 | 174 | | 12 | | 22 | R | 10 | 285 | | 16 |
| 23 | R | 5 | 77 | | 5 | | 23 | R | 40 | 190 | | 11 |
| 24 | R | 5 | 95 | | 7 | | 24 | R | 20 | 475 | | 26 |
| 25 | R | 5 | 115 | | 8 | | 25 | R | 30 | 285 | | 16 |
| 26 | R | 10 | 133 | | 9 | | 26 | R | 20 | 380 | | 21 |
| 27 | R | 5 | 132 | | 9 | | 27 | R | 20 | 285 | | 16 |
| 28 | R | 10 | 137 | | 10 | | 28 | R | 20 | 285 | | 16 |
| 29 | R | 5 | 116 | | 8 | | 29 | R | 10 | 285 | | 16 |
| 30 | MR | 5 | 77 | | 5 | | 30 | MR | 30 | 190 | | 11 |
| 31 | R | 5 | 95 | | 7 | | 31 | R | 20 | 380 | | 21 |
| 32 | R | 5 | 132 | | 9 | | 32 | R | 40 | 285 | | 16 |
| 33 | R | 5 | 115 | | 8 | | 33 | R | 20 | 285 | | 16 |
| 34 | R | 5 | 115 | | 8 | | 34 | R | 40 | 475 | | 26 |
| 35 | R | 10 | 96 | | 7 | | 35 | R | 30 | 380 | | 21 |
| 36 | R | 10 | 208 | | 15 | | 36 | MR | 60 | 950 | | 53 |
| 37 | R | 50 | 468 | | 33 | | 37 | R | 40 | 143 | | 8 |
| 38 | R | 20 | 396 | | 28 | | 38 | R | 70 | 855 | | 47 |
| 39 | MR | 60 | 573 | | 40 | | 39 | MR | 40 | 1045 | | 58 |
| 40 | MR | 80 | 797 | | 56 | | 40 | MS | 70 | 1330 | | 74 |
| 41 | MR | 40 | 536 | | 37 | | 41 | MR | 50 | 1140 | | 63 |
| 42 | MR | 60 | 608 | | 42 | | 42 | S | 60 | 1425 | | 79 |
| 43 | R | 30 | 305 | | 21 | | 43 | MR | 40 | 570 | | 32 |
| 44 | R | 70 | 535 | | 37 | | 44 | MR | 30 | 1425 | | 79 |
| 45 | R | 30 | 273 | | 19 | | 45 | MR | 20 | 665 | | 37 |
| 46 | R | 40 | 287 | | 20 | | 46 | MR | 30 | 1330 | | 74 |
| 47 | MR | 30 | 138 | | 10 | | 47 | R | 30 | 665 | | 37 |
| 48 | R | 50 | 125 | | 9 | | 48 | R | 40 | 475 | | 26 |
| 49 | R | 5 | 190 | | 13 | | 49 | R | 20 | 475 | | 26 |
| 50 | R | 15 | 117 | | 8 | | 50 | R | 20 | 380 | | 21 |
| 51 | R | 10 | 133 | | 9 | | 51 | R | 40 | 380 | | 21 |
| 52 | R | 5 | 132 | | 9 | | 52 | R | 10 | 475 | | 26 |
| 53 | R | 5 | 150 | | 10 | | 53 | R | 30 | 570 | | 32 |
| 54 | R | 5 | 132 | | 9 | | 54 | R | 30 | 380 | | 21 |
| 55 | MR | 5 | 115 | | 8 | | 55 | MR | 40 | 285 | | 16 |
| 56 | R | 5 | 190 | | 13 | | 56 | R | 70 | 570 | | 32 |
| 57 | R | 5 | 190 | | 13 | | 57 | R | 20 | 190 | | 11 |
| 58 | R | 5 | 167 | | 12 | | 58 | R | 20 | 475 | | 26 |
| 59 | R | 10 | 133 | | 9 | | 59 | R | 10 | 475 | | 26 |
| 60 | R | 70 | 538 | | 38 | | 60 | R | 20 | 570 | | 32 |
| 61 | MR | 5 | 298 | | 21 | | 61 | S | 80 | 1425 | | 79 |
| 62 | R | 10 | 238 | | 17 | | 62 | R | 10 | 285 | | 16 |
| 63 | R | 5 | 132 | | 9 | | 63 | R | 10 | 285 | | 16 |
| 64 | R | 40 | 655 | | 46 | | 64 | R | 20 | 190 | | 11 |
| 65 | R | 10 | 224 | | 16 | | 65 | R | 30 | 285 | | 16 |
| 66 | R | 10 | 133 | | 9 | | 66 | R | 10 | 190 | | 11 |
| 67 | R | 5 | 115 | | 8 | | 67 | R | 20 | 285 | | 16 |
| 68 | R | 5 | 286 | | 20 | | 68 | R | 10 | 143 | | 8 |
| 69 | R | 5 | 190 | | 13 | | 69 | R | 30 | 285 | | 16 |
| 70 | R | 5 | 153 | | 11 | | 70 | R | 40 | 380 | | 21 |
| 71 | R | 10 | 133 | | 9 | | 71 | R | 10 | 190 | | 11 |
| 72 | R | 5 | 228 | | 16 | | 72 | R | 30 | 285 | | 16 |
| 73 | R | 5 | 150 | | 10 | | 73 | R | 10 | 285 | | 16 |
| 74 | R | 10 | 133 | | 9 | | 74 | R | 20 | 475 | | 26 |
| 75 | R | 5 | 242 | | 17 | | 75 | R | 10 | 570 | | 32 |
| 76 | R | 10 | 133 | | 9 | | 76 | R | 10 | 285 | | 16 |
| 77 | R | 5 | 223 | | 16 | | 77 | R | 20 | 475 | | 26 |
| 78 | R | 5 | 132 | | 9 | | 78 | R | 20 | 190 | | 11 |
| 79 | R | 5 | 115 | | 8 | | 79 | R | 40 | 665 | | 37 |
| 80 | R | 10 | 226 | | 16 | | 80 | R | 20 | 380 | | 21 |
| 81 | MR | 5 | 225 | | 16 | | 81 | MS | 50 | 285 | | 16 |
| 82 | R | 5 | 207 | | 14 | | 82 | R | 10 | 285 | | 16 |
| 83 | R | 10 | 339 | | 24 | | 83 | R | 20 | 285 | | 16 |
| 84 | R | 60 | 589 | | 41 | | 84 | R | 70 | 570 | | 32 |
| 85 | R | 10 | 208 | | 15 | | 85 | R | 60 | 760 | | 42 |
| 86 | R | 10 | 154 | | 11 | | 86 | R | 10 | 190 | | 11 |
| 87 | R | 10 | 172 | | 12 | | 87 | R | 70 | 190 | | 11 |
| 88 | R | 10 | 208 | | 15 | | 88 | R | 10 | 380 | | 21 |
| 89 | MR | 50 | 842 | | 59 | | 89 | MR | 30 | 950 | | 11 |
| 90 | MS | 70 | 849 | | 59 | | 90 | S | 60 | 1615 | | 89 |
| 91 | S | 50 | 303 | | 21 | | 91 | MS | 80 | 855 | | 47 |
| 92 | MR | 70 | 869 | | 61 | | 92 | MR | 60 | 760 | | 42 |
| 93 | MR | 10 | 151 | | 11 | | 93 | MS | 70 | 665 | | 37 |
| 94 | R | 5 | 150 | | 10 | | 94 | R | 10 | 475 | | 26 |
| 95 | R | 10 | 207 | | 14 | | 95 | R | 10 | 380 | | 21 |
| 96 | MS | 80 | 924 | | 64 | | 96 | MR | 20 | 570 | | 32 |
| 97 | MS | 70 | 133 | | 9 | | 97 | MS | 60 | 1520 | | 84 |
| 98 | R | 5 | 188 | | 13 | | 98 | R | 20 | 285 | | 16 |
| 99 | R | 10 | 184 | | 13 | | 99 | R | 10 | 285 | | 16 |
| 100 | R | 5 | 153 | | 11 | | 100 | R | 20 | 665 | | 37 |
| 101 | R | 5 | 132 | | 9 | | 101 | R | 20 | 380 | | 21 |
| 102 | R | 5 | 167 | | 12 | | 102 | R | 10 | 380 | | 21 |
| 103 | R | 5 | 228 | | 16 | | 103 | R | 20 | 285 | | 16 |
| 104 | R | 5 | 242 | | 17 | | 104 | R | 10 | 190 | | 11 |
| 105 | R | 30 | 229 | | 16 | | 105 | R | 10 | 285 | | 16 |
| 106 | R | 10 | 326 | | 23 | | 106 | R | 20 | 475 | | 26 |
| 107 | R | 10 | 334 | | 23 | | 107 | R | 20 | 190 | | 11 |
| 108 | R | 10 | 168 | | 12 | | 108 | R | 20 | 380 | | 21 |
| 109 | R | 10 | 224 | | 16 | | 109 | R | 50 | 285 | | 16 |
| 110 | R | 10 | 133 | | 9 | | 110 | R | 60 | 285 | | 16 |
| 111 | R | 10 | 176 | | 12 | | 111 | R | 30 | 380 | | 21 |
| 112 | R | 10 | 189 | | 13 | | 112 | R | 40 | 380 | | 21 |
| 113 | R | 30 | 208 | | 15 | | 113 | R | 50 | 380 | | 21 |
| 114 | R | 40 | 1086 | | 76 | | 114 | MR | 20 | 665 | | 37 |
| 115 | MR | 80 | 304 | | 21 | | 115 | MR | 10 | 760 | | 42 |
| 116 | R | 5 | 321 | | 22 | | 116 | R | 20 | 380 | | 21 |
| 117 | R | 10 | 229 | | 16 | | 117 | MR | 10 | 570 | | 32 |
| 118 | MS | 80 | 275 | | 19 | | 118 | S | 80 | 1520 | | 84 |
| 119 | R | 10 | 208 | | 15 | | 119 | R | 30 | 380 | | 21 |
| 120 | R | 5 | 282 | | 20 | | 120 | R | 10 | 475 | | 26 |
| 121 | R | 10 | 133 | | 9 | | 121 | R | 10 | 285 | | 16 |
| 122 | R | 5 | 190 | | 13 | | 122 | R | 50 | 475 | | 26 |
| 123 | R | 5 | 150 | | 10 | | 123 | MR | 70 | 190 | | 11 |
| 124 | R | 40 | 281 | | 20 | | 124 | R | 30 | 380 | | 21 |
| 125 | R | 60 | 723 | | 50 | | 125 | R | 10 | 190 | | 11 |
| 126 | R | 5 | 298 | | 21 | | 126 | R | 20 | 285 | | 16 |
| 127 | R | 10 | 229 | | 16 | | 127 | R | 10 | 475 | | 26 |
| 128 | R | 70 | 781 | | 54 | | 128 | MR | 20 | 950 | | 53 |
| 129 | MR | 70 | 304 | | 21 | | 129 | MR | 10 | 1140 | | 63 |
| 130 | R | 15 | 97 | | 7 | | 130 | R | 20 | 380 | | 21 |
| 131 | R | 10 | 208 | | 15 | | 131 | R | 40 | 285 | | 16 |
| 132 | MR | 60 | 289 | | 20 | | 132 | MR | 10 | 665 | | 37 |
| 133 | R | 10 | 154 | | 11 | | 133 | R | 40 | 285 | | 16 |
| 134 | R | 30 | 286 | | 20 | | 134 | R | 20 | 238 | | 13 |
| 135 | R | 10 | 133 | | 9 | | 135 | R | 20 | 285 | | 16 |
| 136 | R | 10 | 137 | | 10 | | 136 | R | 10 | 475 | | 26 |
| **PI 388222** | R | 30 | 175 | | 12 | | **PI 388222** | R | 20 | **380** | | 21 |
| **AVO S** | S | 90 | 1280 | | 89 | | **AVO S** | S | 80 | **1615** | | 89 |
| **MOROCCO** | S | 100 | 1434 | | 100 | | **MOROCCO** | S | 100 | **1805** | | 100 |













