**Supplementary files**

Table S1:Pedigree information of the genetic materials used for the study

|  |  |  |
| --- | --- | --- |
| S/N | Designation | Pedigree |
| 1 | TZEEIOR 142 | 2009 TZEE-0R1 STR S9 46-1/2-1/3-2/2-3/3-2/2 |
| 2 | TZEEIOR 202 | 2009 TZEE-0R1 STR S9 68-3/3-1/3-1/2-3/4-1/1 |
| 3 | TZEEIOR 205 | 2009 TZEE-0R1 STR S9 74-1/2-1/3-1/2-2/3-1/1 |
| 4 | TZEEIOR 209 | 2009 TZEE-ORI STR S9 78-1/1-2/3-2/2-1/1-1/1 |
| 5 | TZEEIOR 221 | 2009 TZEE-0R1 STR S9 80-3/3-1/3-1/1-1/6-1/1 |
| 6 | TZEEIOR 24 | 2009 TZEE-0R1 STR S9 3-3/3-2/3-1/3-2/3-1/1 |
| 7 | TZEEIOR 28 | 2009 TZEE-0R1 STR S9 3-3/3-3/3-4/4-2/2-1/1 |
| 8 | TZEEIOR 41 | 2009 TZEE-0R1 STR S9 8-3/3-2/3-2/5-1/7-1/1 |
| 9 | TZEEIOR 45 | 2009 TZEE-0R1 STR S9 8-3/3-2/3-4/5-4/4-2/2 |
| 10 | TZEEIOR 289 | (TZdEEI 12 x TZEEI 95)S8 Inb 50-1/1-1/1-1/2-2/2-1/1 |
| 11 | TZEEIOR 290 | (TZdEEI 12 x TZEEI 95)S8 Inb 50-1/1-1/1-2/2-2/2-1/1 |
| 12 | TZEEIOR 305 | (TZdEEI 12 x TZEEI 95)S8 Inb 82-1/1-1/1-3/3-1/1-1/1 |
| 13 | TZEEIOR 314 | (TZdEEI 12 x TZEEI 95)S8 Inb 106-1/1-2/2-1/2-2/2-1/1 |
| 14 | TZEEIOR 321 | (TZdEEI 12 x TZEEI 95)S8 Inb 110-1/1-2/2-2/2-1/1-1/1 |
| 15 | TZEEIOR 346 | (TZdEEI 12 x TZEEI 95)S8 Inb 147-1/1-1/1-2/2-1/2-1/1 |
| 16 | TZEEIOR 349 | (TZdEEI 12 x TZEEI 95)S8 Inb 161-1/1-2/2-1/2-3/3-1/1 |
| 17 | TZEEIOR 365 | (TZdEEI 12 x TZEEI 95)S8 Inb 181-1/1-2/2-2/2-1/1-1/1 |
| 18 | TZEEIOR 381 | (TZdEEI 12 x TZEEI 95)S8 Inb 235-1/1-1/1-1/2-2/2-1/1 |
| 19 | TZEEIOR 384 | (TZdEEI 12 x TZEEI 95)S8 Inb 246-1/1-1/1-1/2-1/1-1/1 |
| 20 | TZEEIOR 396 | (TZdEEI 12 x TZEEI 95)S8 Inb 334-1/1-1/1-2/2-3/3-1/1 |
| 21 | TZEEIOR 458 | (TZdEEI 7 x TZdEEI 12)S8 Inb 54-1/1-1/1-1/3-2/2-1/1 |
| 22 | TZEEIOR 479 | (TZdEEI 7 x TZdEEI 12)S8 Inb 72-2/2-1/1-1/2-1/1-1/1 |
| 23 | TZEEIOR 486 | (TZdEEI 7 x TZdEEI 12)S8 Inb 91-1/1-1/1-1/4-1/2-1/1 |
| 24 | TZEEIOR 500 | (TZdEEI 7 x TZdEEI 12)S8 Inb 123-1/2-1/1-1/2-1/1-1/1 |
| 25 | TZEEIOR 509 | (TZdEEI 7 x TZdEEI 12)S8 Inb 125-2/2-1/1-3/3-2/2-1/1 |
| 26 | TZEEIOR 510 | (TZdEEI 7 x TZdEEI 12)S8 Inb 134-1/1-1/1-1/2-1/1-1/1 |
| 27 | TZEEIOR 513 | (TZdEEI 7 x TZdEEI 12)S8 Inb 140-1/2-1/1-2/3-1/1-1/1 |
| 28 | TZEEIOR 515 | (TZdEEI 7 x TZdEEI 12)S8 Inb 140-2/2-1/1-1/2-1/1-1/1 |
| 29 | TZEEIOR 523 | (TZdEEI 7 x TZdEEI 12)S8 Inb 142-2/2-1/1-2/3-2/2-1/1 |
| 30 | TZEEIOR 525 | (TZdEEI 7 x TZdEEI 12)S8 Inb 144-1/2-1/1-1/1-1/2-1/1 |
| 31 | TZEEIOR 526 | (TZdEEI 7 x TZdEEI 12)S8 Inb 144-1/2-1/1-1/1-2/2-1/1 |
| 32 | TZEEIOR 536 | (TZdEEI 7 x TZdEEI 12)S8 Inb 154-1/1-1/1-2/4-1/1-1/1 |
| 33 | TZEEIOR 540 | (TZdEEI 7 x TZdEEI 12)S8 Inb 162-2/2-1/1-1/3-1/2-1/1 |
| 34 | TZEEIOR 542 | (TZdEEI 7 x TZdEEI 12)S8 Inb 163-1/1-1/1-2/3-1/2-1/1 |
| 35 | TZEEIOR 546 | (TZdEEI 7 x TZdEEI 12)S8 Inb 168-1/1-1/1-1/1-1/2-1/1 |
| 36 | TZEEIOR 548 | (TZdEEI 7 x TZdEEI 12)S8 Inb 171-1/1-1/1-1/3-1/2-1/1 |
| 37 | TZEEIOR 197 (Tester) | 2009 TZEE-ORI STR S9 68-1/3-2/3-2/2-1/3-1/1 |
| 38 | TZEEIOR 97(Tester) | 2009 TZEE-ORI STR S9 15-2/2-1/2-1/3-3/3-1/1 |
| 39 | TZEEIOR 9A (Tester) |  |
| 40  41 | TZEEIOR 30 (Tester)  TZEEIOR 249 (Tester) | 2009 TZEE-ORI STR S9 5-1/1-2/3-1/2-2/2-1/1  2009 TZEE-ORI STR S9 9100-3/3-1/3-1/1-1/3-1/3 |

Table S2: Ranking of 196 hybrids using the Multi-Trait Genotype-Ideotype Distance Index (MGIDI)

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | Entry | MGIDI | Hybrids |
| 1 | 70 | 1.53 | TZEEIOR 510 ×TZEEIOR 97 |
| 2 | 106 | 1.85 | TZEEIOR 510 × TZEEIOR 249 |
| 3 | 110 | 1.9 | TZEEIOR 321 × TZEEIOR 197 |
| 4 | 149 | 1.96 | TZEEIOR 384 ×TZEEIOR 30 |
| 5 | 118 | 2.06 | TZEEIOR 458 × TZEEIOR 197 |
| 6 | 22 | 2.06 | TZEEIOR 28 × TZEEIOR 9 A |
| 7 | 68 | 2.07 | TZEEIOR 526 × TZEEIOR 97 |
| 8 | 164 | 2.08 | TZEEIOR 202 × TZEEIOR 30 |
| 9 | 52 | 2.12 | TZEEIOR 523 × TZEEIOR 97 |
| 10 | 121 | 2.17 | TZEEIOR 509 × TZEEIOR 197 |
| 11 | 119 | 2.24 | TZEEIOR 479 × TZEEIOR 197 |
| 12 | 192 | 2.26 | CHECK 2 - TZEEI 79 × TZEEI 82 |
| 13 | 159 | 2.36 | TZEEIOR 540 × TZEEIOR 30 |
| 14 | 81 | 2.36 | TZEEIOR 515 × TZEEIOR 249 |
| 15 | 142 | 2.42 | TZEEIOR 510 × TZEEIOR 197 |
| 16 | 109 | 2.59 | TZEEIOR 346 × TZEEIOR 197 |
| 17 | 86 | 2.6 | TZEEIOR 540 × TZEEIOR 249 |
| 18 | 144 | 2.64 | TZEEIOR 305 × TZEEIOR 197 |
| 19 | 19 | 2.65 | TZEEIOR 202 × TZEEIOR 9 A |
| 20 | 57 | 2.66 | TZEEIOR 24 × TZEEIOR 97 |
| 21 | 135 | 2.66 | TZEEIOR 142 × TZEEIOR 197 |
| 22 | 173 | 2.67 | TZEEIOR 381 × TZEEIOR 30 |
| 23 | 98 | 2.68 | TZEEIOR 221 × TZEEIOR 249 |
| 24 | 47 | 2.69 | TZEEIOR 479 × TZEEIOR 97 |
| 25 | 165 | 2.76 | TZEEIOR 205 × TZEEIOR 30 |
| 26 | 189 | 2.78 | TZEEIOR 197 × TZEEIOR 249 |
| 27 | 93 | 2.83 | TZEEIOR 24 × TZEEIOR 249 |
| 28 | 120 | 2.85 | TZEEIOR 513 × TZEEIOR 197 |
| 29 | 114 | 2.85 | TZEEIOR 289 × TZEEIOR 197 |
| 30 | 176 | 2.86 | TZEEIOR 486 × TZEEIOR 30 |
| 31 | 23 | 2.87 | TZEEIOR 41 × TZEEEIOR 9 A |
| 32 | 74 | 2.89 | TZEEIOR 321 × TZEEIOR 249 |
| 33 | 96 | 2.91 | TZEEIOR 45 × TZEEIOR 249 |
| 34 | 92 | 2.92 | TZEEIOR 205 × TZEEIOR 249 |
| 35 | 95 | 2.93 | TZEEIOR 41 × TZEEEIOR 249 |
| 36 | 38 | 2.93 | TZEEIOR 321 × TZEEIOR 97 |
| 37 | 128 | 2.95 | TZEEIOR 205 × TZEEIOR 197 |
| 38 | 111 | 2.96 | TZEEIOR 314 × TZEEIOR 197 |
| 39 | 97 | 2.98 | TZEEIOR 209 × TZEEIOR 249 |
| 40 | 158 | 3.02 | TZEEIOR 509 × TZEEIOR 30 |
| 41 | 143 | 3.02 | TZEEIOR 546 × TZEEIOR 197 |
| 42 | 186 | 3.03 | TZEEIOR 97 × TZEEIOR 249 |
| 43 | 20 | 3.04 | TZEEIOR 205 × TZEEIOR 9 A |
| 44 | 146 | 3.05 | TZEEIOR 321 × TZEEIOR 30 |
| 45 | 136 | 3.06 | TZEEIOR 381 × TZEEIOR 197 |
| 46 | 79 | 3.09 | TZEEIOR 365 × TZEEIOR 249 |
| 47 | 50 | 3.09 | TZEEIOR 540 × TZEEIOR 97 |
| 48 | 124 | 3.1 | TZEEIOR 523 × TZEEIOR 197 |
| 49 | 175 | 3.13 | TZEEIOR 536 × TZEEIOR 30 |
| 50 | 94 | 3.13 | TZEEIOR 28 × TZEEIOR 249 |
| 51 | 188 | 3.13 | TZEEIOR 197 × TZEEIOR 9A |
| 52 | 185 | 3.15 | TZEEIOR 97 × TZEEIOR 197 |
| 53 | 122 | 3.16 | TZEEIOR 540 × TZEEIOR 197 |
| 54 | 162 | 3.17 | TZEEIOR 542 × TZEEIOR 30 |
| 55 | 178 | 3.18 | TZEEIOR 525 × TZEEIOR 30 |
| 56 | 91 | 3.21 | TZEEIOR 202 × TZEEIOR 249 |
| 57 | 55 | 3.23 | TZEEIOR 202 × TZEEIOR 97 |
| 58 | 129 | 3.26 | TZEEIOR 24 × TZEEIOR 197 |
| 59 | 112 | 3.28 | TZEEIOR 396 × TZEEIOR 197 |
| 60 | 193 | 3.28 | CHECK 3 - TZEEIY Pop STR C5 × TZEEI 58 |
| 61 | 180 | 3.29 | TZEEIOR 546 × TZEEIOR 30 |
| 62 | 190 | 3.29 | TZEEIOR 249 × TZEEIOR 9 A |
| 63 | 187 | 3.3 | TZEEIOR 97 × TZEEIOR 9 A |
| 64 | 134 | 3.31 | TZEEIOR 221 × TZEEIOR 197 |
| 65 | 131 | 3.32 | TZEEIOR 41 × TZEEEIOR 197 |
| 66 | 104 | 3.32 | TZEEIOR 526 × TZEEIOR 249 |
| 67 | 48 | 3.33 | TZEEIOR 513 × TZEEIOR 97 |
| 68 | 39 | 3.37 | TZEEIOR 314 × TZEEIOR 97 |
| 69 | 46 | 3.39 | TZEEIOR 458 × TZEEIOR 97 |
| 70 | 67 | 3.4 | TZEEIOR 486 × TZEEIOR 97 |
| 71 | 88 | 3.4 | TZEEIOR 523 × TZEEIOR 249 |
| 72 | 41 | 3.41 | TZEEIOR 384 ×TZEEIOR 97 |
| 73 | 141 | 3.42 | TZEEIOR 525 × TZEEIOR 197 |
| 74 | 153 | 3.43 | TZEEIOR 290 × TZEEIOR 30 |
| 75 | 24 | 3.44 | TZEEIOR 45 × TZEEIOR 9 A |
| 76 | 182 | 3.45 | TZEEIOR 30 × TZEEIOR 197 |
| 77 | 152 | 3.45 | TZEEIOR 305 × TZEEIOR 30 |
| 78 | 54 | 3.45 | TZEEIOR 500 × TZEEIOR 97 |
| 79 | 102 | 3.46 | TZEEIOR 536 × TZEEIOR 249 |
| 80 | 76 | 3.51 | TZEEIOR 396 × TZEEIOR 249 |
| 81 | 45 | 3.51 | TZEEIOR 515 × TZEEIOR 97 |
| 82 | 21 | 3.55 | TZEEIOR 24 × TZEEIOR 9 A |
| 83 | 196 | 3.56 | CHECK 6 -TZdEEI 1 × TZdEEI 12 |
| 84 | 83 | 3.57 | TZEEIOR 479 × TZEEIOR 249 |
| 85 | 147 | 3.57 | TZEEIOR 314 × TZEEIOR 30 |
| 86 | 80 | 3.58 | TZEEIOR 290 × TZEEIOR 249 |
| 87 | 89 | 3.58 | TZEEIOR 542 TZEEIOR 249 |
| 88 | 10 | 3.59 | TZEEIOR 458 × TZEEIOR 9 A |
| 89 | 73 | 3.61 | TZEEIOR 346 × TZEEIOR 249 |
| 90 | 139 | 3.61 | TZEEIOR 486 × TZEEIOR 197 |
| 91 | 75 | 3.62 | TZEEIOR 314 × TZEEIOR 249 |
| 92 | 27 | 3.63 | TZEEIOR 142 × TZEEIOR 9 A |
| 93 | 179 | 3.64 | TZEEIOR 510 × TZEEIOR 30 |
| 94 | 155 | 3.64 | TZEEIOR 458 × TZEEIOR 30 |
| 95 | 99 | 3.65 | TZEEIOR 142 × TZEEIOR 249 |
| 96 | 108 | 3.65 | TZEEIOR 305 × TZEEIOR 249 |
| 97 | 103 | 3.65 | TZEEIOR 486 × TZEEIOR 249 |
| 98 | 3 | 3.65 | TZEEIOR 314 × TZEEIOR 9 A |
| 99 | 138 | 3.66 | TZEEIOR 536 × TZEEIOR 197 |
| 100 | 172 | 3.66 | TZEEIOR 142 × TZEEIOR 30 |
| 101 | 184 | 3.67 | TZEEIOR 30 × TZEEIOR 9 A |
| 102 | 130 | 3.67 | TZEEIOR 28 × TZEEIOR 197 |
| 103 | 11 | 3.68 | TZEEIOR 479 × TZEEIOR 9 A |
| 104 | 105 | 3.69 | TZEEIOR 525 × TZEEIOR 249 |
| 105 | 14 | 3.69 | TZEEIOR 540 × TZEEIOR 9 A |
| 106 | 150 | 3.71 | TZEEIOR 289 × TZEEIOR 30 |
| 107 | 82 | 3.73 | TZEEIOR 458 × TZEEIOR 249 |
| 108 | 123 | 3.74 | TZEEIOR 548 × TZEEIOR 197 |
| 109 | 77 | 3.75 | TZEEIOR 384 ×TZEEIOR 249 |
| 110 | 183 | 3.79 | TZEEIOR 30 × TZEEIOR 249 |
| 111 | 170 | 3.79 | TZEEIOR 209 × TZEEIOR 30 |
| 112 | 125 | 3.82 | TZEEIOR 542 TZEEIOR 197 |
| 113 | 63 | 3.85 | TZEEIOR 142 × TZEEIOR 97 |
| 114 | 90 | 3.86 | TZEEIOR 500 × TZEEIOR 249 |
| 115 | 140 | 3.86 | TZEEIOR 526 × TZEEIOR 197 |
| 116 | 137 | 3.86 | TZEEIOR 349 ×TZEEIOR 197 |
| 117 | 194 | 3.88 | CHECH 4 - TZdEEI 1 × TZdEEI 5 |
| 118 | 191 | 3.88 | CHECK 1 TZEEIOR 109 × TZdEEI 12 |
| 119 | 1 | 3.89 | TZEEIOR 346 × TZEEIOR 9 A |
| 120 | 37 | 3.9 | TZEEIOR 346 × TZEEIOR 97 |
| 121 | 163 | 3.9 | TZEEIOR 500 × TZEEIOR 30 |
| 122 | 151 | 3.93 | TZEEIOR 365 × TZEEIOR 30 |
| 123 | 154 | 3.93 | TZEEIOR 515 × TZEEIORV 30 |
| 124 | 177 | 3.95 | TZEEIOR 526 × TZEEIOR 30 |
| 125 | 116 | 3.96 | TZEEIOR 290 × TZEEIOR 197 |
| 126 | 42 | 3.96 | TZEEIOR 289 × TZEEIOR 97 |
| 127 | 56 | 3.98 | TZEEIOR 205 × TZEEIOR 97 |
| 128 | 66 | 3.98 | TZEEIOR 536 × TZEEIOR 97 |
| 129 | 35 | 4 | TZEEIOR 546 × TZEEIOR 9 A |
| 130 | 100 | 4.02 | TZEEIOR 381 × TZEEIOR 249 |
| 131 | 49 | 4.03 | TZEEIOR 509 × TZEEIOR 97 |
| 132 | 161 | 4.04 | TZEEIOR 523 × TZEEIOR 30 |
| 133 | 181 | 4.05 | TZEEIOR 30 × TZEEIOR 97 |
| 134 | 126 | 4.05 | TZEEIOR 500 × TZEEIOR 197 |
| 135 | 85 | 4.05 | TZEEIOR 509 × TZEEIOR 249 |
| 136 | 117 | 4.06 | TZEEIOR 515 × TZEEIOR 197 |
| 137 | 40 | 4.11 | TZEEIOR 396 × TZEEIOR 97 |
| 138 | 34 | 4.13 | TZEEIOR 510 × TZEEIOR 9 A |
| 139 | 78 | 4.13 | TZEEIOR 289 × TZEEIOR 249 |
| 140 | 61 | 4.16 | TZEEIOR 209 × TZEEIOR 97 |
| 141 | 101 | 4.16 | TZEEIOR 349 ×TZEEIOR 249 |
| 142 | 113 | 4.2 | TZEEIOR 384 ×TZEEIOR 197 |
| 143 | 71 | 4.2 | TZEEIOR 546 × TZEEIOR 97 |
| 144 | 84 | 4.23 | TZEEIOR 513 × TZEEIOR 249 |
| 145 | 87 | 4.23 | TZEEIOR 548 × TZEEIOR 249 |
| 146 | 133 | 4.29 | TZEEIOR 209 × TZEEIOR 197 |
| 147 | 43 | 4.34 | TZEEIOR 365 × TZEEIOR 97 |
| 148 | 59 | 4.39 | TZEEIOR 41 × TZEEEIOR 97 |
| 149 | 62 | 4.42 | TZEEIOR 221 × TZEEIOR 97 |
| 150 | 156 | 4.42 | TZEEIOR 479 × TZEEIOR 30 |
| 151 | 127 | 4.44 | TZEEIOR 202 × TZEEIOR 197 |
| 152 | 7 | 4.49 | TZEEIOR 365 × TZEEIOR 9 A |
| 153 | 51 | 4.5 | TZEEIOR 548 × TZEEIOR 97 |
| 154 | 145 | 4.51 | TZEEIOR 346 × TZEEIOR 30 |
| 155 | 171 | 4.53 | TZEEIOR 221 × TZEEIOR 30 |
| 156 | 13 | 4.53 | TZEEIOR 509 × TZEEIOR 9 A |
| 157 | 8 | 4.53 | TZEEIOR 290 × TZEEIOR 9 A |
| 158 | 53 | 4.54 | TZEEIOR 542 TZEEIOR 97 |
| 159 | 107 | 4.59 | TZEEIOR 546 × TZEEIOR 249 |
| 160 | 15 | 4.62 | TZEEIOR 548 × TZEEIOR 9 A |
| 161 | 25 | 4.63 | TZEEIOR 209 × TZEEIOR 9 A |
| 162 | 132 | 4.64 | TZEEIOR 45 × TZEE OR 197 |
| 163 | 157 | 4.66 | TZEEIOR 513 × TZEEIOR 30 |
| 164 | 4 | 4.69 | TZEEIOR 396 × TZEEIOR 9 A |
| 165 | 32 | 4.7 | TZEEIOR 526 × TZEEIOR 9 A |
| 166 | 115 | 4.73 | TZEEIOR 365 × TZEEIOR 197 |
| 167 | 160 | 4.74 | TZEEIOR 548 × TZEEIOR 30 |
| 168 | 64 | 4.77 | TZEEIOR 381 × TZEEIOR 97 |
| 169 | 44 | 4.81 | TZEEIOR 290 × TZEEIOR 97 |
| 170 | 36 | 4.82 | TZEEIOR 305 × TZEEIOR 9 A |
| 171 | 6 | 4.83 | TZEEIOR 289 × TZEEIOR 9 A |
| 172 | 60 | 4.83 | TZEEIOR 45 × TZEEIOR 97 |
| 173 | 9 | 4.87 | TZEEIOR 515 × TZEEIOR 9 A |
| 174 | 12 | 4.92 | TZEEIOR 513 × TZEEIOR 9 A |
| 175 | 31 | 4.95 | TZEEIOR 486 × TZEEIOR 9 A |
| 176 | 2 | 5.04 | TZEEIOR 321 × TZEEIOR 9 A |
| 177 | 174 | 5.11 | TZEEIOR 349 ×TZEEIOR 30 |
| 178 | 5 | 5.12 | TZEEIOR 384 ×TZEEIOR 9 A |
| 179 | 195 | 5.15 | CHECK 5 - TZEEIOR 12 × TZEEIOR 223 |
| 180 | 33 | 5.16 | TZEEIOR 525 × TZEEIOR 9 A |
| 181 | 148 | 5.21 | TZEEIOR 396 × TZEEIOR 30 |
| 182 | 28 | 5.29 | TZEEIOR 381 × TZEEIOR 9 A |
| 183 | 72 | 5.34 | TZEEIOR 305 × TZEEIOR 97 |
| 184 | 17 | 5.47 | TZEEIOR 542 TZEEIOR 9 A |
| 185 | 58 | 5.48 | TZEEIOR 28 × TZEEIOR 97 |
| 186 | 18 | 5.65 | TZEEIOR 500 × TZEEIOR 9 A |
| 187 | 30 | 5.77 | TZEEIOR 536 × TZEEIOR 9 A |
| 188 | 167 | 5.78 | TZEEIOR 28 × TZEEIOR 30 |
| 189 | 65 | 5.86 | TZEEIOR 349 ×TZEEIOR 97 |
| 190 | 69 | 5.92 | TZEEIOR 525 × TZEEIOR 97 |
| 191 | 29 | 5.93 | TZEEIOR 349 ×TZEEIOR 9 A |
| 192 | 16 | 5.97 | TZEEIOR 523 × TZEEIOR 9 A |
| 193 | 169 | 6.03 | TZEEIOR 45 × TZEEIOR 30 |
| 194 | 166 | 6.21 | TZEEIOR 24 × TZEEIOR 30 |
| 195 | 26 | 6.31 | TZEEIOR 221 × TZEEIOR 9 A |
| 196 | 168 | 6.79 | TZEEIOR 41 × TZEEEIOR 30 |

Table S3: Ranking of 196 hybrids using multiple trait base index (MBI)

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | Entry | Hybrids | MBI |
| 1 | 121 | TZEEIOR 509 × TZEEIOR 197 | 15.94 |
| 2 | 118 | TZEEIOR 458 × TZEEIOR 197 | 15.91 |
| 3 | 179 | TZEEIOR 510 × TZEEIOR 30 | 15.18 |
| 4 | 70 | TZEEIOR 510 × TZEEIOR 97 | 15.07 |
| 5 | 106 | TZEEIOR 510 × TZEEIOR 249 | 12.15 |
| 6 | 110 | TZEEIOR 321 × TZEEIOR 197 | 11.24 |
| 7 | 149 | TZEEIOR 384 ×TZEEIOR 30 | 10.71 |
| 8 | 159 | TZEEIOR 540 × TZEEIOR 30 | 10.69 |
| 9 | 52 | TZEEIOR 523 × TZEEIOR 97 | 10.5 |
| 10 | 119 | TZEEIOR 479 × TZEEIOR 197 | 10.41 |
| 11 | 81 | TZEEIOR 515 × TZEEIOR 249 | 9.81 |
| 12 | 68 | TZEEIOR 526 × TZEEIOR 97 | 9.69 |
| 13 | 74 | TZEEIOR 321 × TZEEIOR 249 | 9.31 |
| 14 | 86 | TZEEIOR 540 × TZEEIOR 249 | 9.02 |
| 15 | 164 | TZEEIOR 202 × TZEEIOR 30 | 8.97 |
| 16 | 142 | TZEEIOR 510 × TZEEIOR 197 | 8.9 |
| 17 | 178 | TZEEIOR 525 × TZEEIOR 30 | 8.85 |
| 18 | 92 | TZEEIOR 205 × TZEEIOR 249 | 8.46 |
| 19 | 39 | TZEEIOR 314 × TZEEIOR 97 | 8.38 |
| 20 | 192 | CHECK 2 - TZEEI 79 × TZEEI 82 | 7.91 |
| 21 | 22 | TZEEIOR 28 × TZEEIOR 9 A | 7.79 |
| 22 | 47 | TZEEIOR 479 × TZEEIOR 97 | 7.7 |
| 23 | 114 | TZEEIOR 289 × TZEEIOR 197 | 7.61 |
| 24 | 173 | TZEEIOR 381 × TZEEIOR 30 | 6.97 |
| 25 | 158 | TZEEIOR 509 × TZEEIOR 30 | 6.84 |
| 26 | 128 | TZEEIOR 205 × TZEEIOR 197 | 6.71 |
| 27 | 109 | TZEEIOR 346 × TZEEIOR 197 | 6.58 |
| 28 | 57 | TZEEIOR 24 × TZEEIOR 97 | 6.41 |
| 29 | 175 | TZEEIOR 536 × TZEEIOR 30 | 6.34 |
| 30 | 190 | TZEEIOR 249 × TZEEIOR 9 A | 6.14 |
| 31 | 144 | TZEEIOR 305 × TZEEIOR 197 | 6.08 |
| 32 | 120 | TZEEIOR 513 × TZEEIOR 197 | 6.03 |
| 33 | 135 | TZEEIOR 142 × TZEEIOR 197 | 6.03 |
| 34 | 143 | TZEEIOR 546 × TZEEIOR 197 | 5.83 |
| 35 | 83 | TZEEIOR 479 × TZEEIOR 249 | 5.8 |
| 36 | 38 | TZEEIOR 321 × TZEEIOR 97 | 5.61 |
| 37 | 54 | TZEEIOR 500 × TZEEIOR 97 | 5.57 |
| 38 | 147 | TZEEIOR 314 × TZEEIOR 30 | 5.49 |
| 39 | 19 | TZEEIOR 202 × TZEEIOR 9 A | 5.4 |
| 40 | 50 | TZEEIOR 540 × TZEEIOR 97 | 5.24 |
| 41 | 165 | TZEEIOR 205 × TZEEIOR 30 | 4.81 |
| 42 | 111 | TZEEIOR 314 × TZEEIOR 197 | 4.72 |
| 43 | 10 | TZEEIOR 458 × TZEEIOR 9 A | 4.72 |
| 44 | 186 | TZEEIOR 97 × TZEEIOR 249 | 4.59 |
| 45 | 75 | TZEEIOR 314 × TZEEIOR 249 | 4.55 |
| 46 | 189 | TZEEIOR 197 × TZEEIOR 249 | 4.53 |
| 47 | 155 | TZEEIOR 458 × TZEEIOR 30 | 4.46 |
| 48 | 152 | TZEEIOR 305 × TZEEIOR 30 | 4.39 |
| 49 | 98 | TZEEIOR 221 × TZEEIOR 249 | 4.2 |
| 50 | 23 | TZEEIOR 41 × TZEEEIOR 9 A | 4.17 |
| 51 | 95 | TZEEIOR 41 × TZEEEIOR 249 | 4.13 |
| 52 | 112 | TZEEIOR 396 × TZEEIOR 197 | 4.1 |
| 53 | 180 | TZEEIOR 546 × TZEEIOR 30 | 4.03 |
| 54 | 97 | TZEEIOR 209 × TZEEIOR 249 | 3.95 |
| 55 | 96 | TZEEIOR 45 × TZEEIOR 249 | 3.8 |
| 56 | 124 | TZEEIOR 523 × TZEEIOR 197 | 3.71 |
| 57 | 185 | TZEEIOR 97 × TZEEIOR 197 | 3.61 |
| 58 | 176 | TZEEIOR 486 × TZEEIOR 30 | 3.57 |
| 59 | 146 | TZEEIOR 321 × TZEEIOR 30 | 3.39 |
| 60 | 48 | TZEEIOR 513 × TZEEIOR 97 | 3.29 |
| 61 | 104 | TZEEIOR 526 × TZEEIOR 249 | 3.21 |
| 62 | 79 | TZEEIOR 365 × TZEEIOR 249 | 3.15 |
| 63 | 11 | TZEEIOR 479 × TZEEIOR 9 A | 3.08 |
| 64 | 102 | TZEEIOR 536 × TZEEIOR 249 | 3.07 |
| 65 | 136 | TZEEIOR 381 × TZEEIOR 197 | 2.97 |
| 66 | 76 | TZEEIOR 396 × TZEEIOR 249 | 2.96 |
| 67 | 41 | TZEEIOR 384 ×TZEEIOR 97 | 2.89 |
| 68 | 193 | CHECK 3 - TZEEIY Pop STR C5 × TZEEI 58 | 2.65 |
| 69 | 20 | TZEEIOR 205 × TZEEIOR 9 A | 2.63 |
| 70 | 82 | TZEEIOR 458 × TZEEIOR 249 | 2.55 |
| 71 | 93 | TZEEIOR 24 × TZEEIOR 249 | 2.29 |
| 72 | 14 | TZEEIOR 540 × TZEEIOR 9 A | 1.94 |
| 73 | 154 | TZEEIOR 515 × TZEEIORV 30 | 1.92 |
| 74 | 94 | TZEEIOR 28 × TZEEIOR 249 | 1.86 |
| 75 | 162 | TZEEIOR 542 × TZEEIOR 30 | 1.71 |
| 76 | 77 | TZEEIOR 384 ×TZEEIOR 249 | 1.65 |
| 77 | 187 | TZEEIOR 97 × TZEEIOR 9 A | 1.6 |
| 78 | 131 | TZEEIOR 41 × TZEEEIOR 197 | 1.59 |
| 79 | 188 | TZEEIOR 197 × TZEEIOR 9A | 1.48 |
| 80 | 145 | TZEEIOR 346 × TZEEIOR 30 | 1.47 |
| 81 | 56 | TZEEIOR 205 × TZEEIOR 97 | 1.35 |
| 82 | 80 | TZEEIOR 290 × TZEEIOR 249 | 1.22 |
| 83 | 88 | TZEEIOR 523 × TZEEIOR 249 | 1.13 |
| 84 | 49 | TZEEIOR 509 × TZEEIOR 97 | 1.12 |
| 85 | 141 | TZEEIOR 525 × TZEEIOR 197 | 0.95 |
| 86 | 91 | TZEEIOR 202 × TZEEIOR 249 | 0.89 |
| 87 | 122 | TZEEIOR 540 × TZEEIOR 197 | 0.83 |
| 88 | 129 | TZEEIOR 24 × TZEEIOR 197 | 0.82 |
| 89 | 156 | TZEEIOR 479 × TZEEIOR 30 | 0.81 |
| 90 | 45 | TZEEIOR 515 × TZEEIOR 97 | 0.72 |
| 91 | 182 | TZEEIOR 30 × TZEEIOR 197 | 0.57 |
| 92 | 134 | TZEEIOR 221 × TZEEIOR 197 | 0.55 |
| 93 | 196 | CHECK 6 -TZdEEI 1 × TZdEEI 12 | 0.52 |
| 94 | 3 | TZEEIOR 314 × TZEEIOR 9 A | 0.43 |
| 95 | 85 | TZEEIOR 509 × TZEEIOR 249 | 0.37 |
| 96 | 183 | TZEEIOR 30 × TZEEIOR 249 | 0.31 |
| 97 | 46 | TZEEIOR 458 × TZEEIOR 97 | 0.28 |
| 98 | 55 | TZEEIOR 202 × TZEEIOR 97 | 0.14 |
| 99 | 150 | TZEEIOR 289 × TZEEIOR 30 | 0.06 |
| 100 | 24 | TZEEIOR 45 × TZEEIOR 9 A | 0 |
| 101 | 153 | TZEEIOR 290 × TZEEIOR 30 | -0.06 |
| 102 | 34 | TZEEIOR 510 × TZEEIOR 9 A | -0.08 |
| 103 | 67 | TZEEIOR 486 × TZEEIOR 97 | -0.09 |
| 104 | 27 | TZEEIOR 142 × TZEEIOR 9 A | -0.16 |
| 105 | 1 | TZEEIOR 346 × TZEEIOR 9 A | -0.2 |
| 106 | 21 | TZEEIOR 24 × TZEEIOR 9 A | -0.26 |
| 107 | 191 | CHECK 1 TZEEIOR 109 × TZdEEI 12 | -0.27 |
| 108 | 73 | TZEEIOR 346 × TZEEIOR 249 | -0.46 |
| 109 | 170 | TZEEIOR 209 × TZEEIOR 30 | -0.48 |
| 110 | 78 | TZEEIOR 289 × TZEEIOR 249 | -0.48 |
| 111 | 151 | TZEEIOR 365 × TZEEIOR 30 | -0.56 |
| 112 | 177 | TZEEIOR 526 × TZEEIOR 30 | -0.62 |
| 113 | 137 | TZEEIOR 349 ×TZEEIOR 197 | -0.64 |
| 114 | 84 | TZEEIOR 513 × TZEEIOR 249 | -0.72 |
| 115 | 108 | TZEEIOR 305 × TZEEIOR 249 | -0.74 |
| 116 | 89 | TZEEIOR 542 TZEEIOR 249 | -0.74 |
| 117 | 138 | TZEEIOR 536 × TZEEIOR 197 | -0.79 |
| 118 | 123 | TZEEIOR 548 × TZEEIOR 197 | -0.92 |
| 119 | 90 | TZEEIOR 500 × TZEEIOR 249 | -0.97 |
| 120 | 66 | TZEEIOR 536 × TZEEIOR 97 | -0.99 |
| 121 | 130 | TZEEIOR 28 × TZEEIOR 197 | -1.09 |
| 122 | 157 | TZEEIOR 513 × TZEEIOR 30 | -1.15 |
| 123 | 105 | TZEEIOR 525 × TZEEIOR 249 | -1.17 |
| 124 | 116 | TZEEIOR 290 × TZEEIOR 197 | -1.22 |
| 125 | 139 | TZEEIOR 486 × TZEEIOR 197 | -1.78 |
| 126 | 35 | TZEEIOR 546 × TZEEIOR 9 A | -1.83 |
| 127 | 194 | CHECH 4 - TZdEEI 1 × TZdEEI 5 | -1.86 |
| 128 | 172 | TZEEIOR 142 × TZEEIOR 30 | -2.02 |
| 129 | 44 | TZEEIOR 290 × TZEEIOR 97 | -2.12 |
| 130 | 163 | TZEEIOR 500 × TZEEIOR 30 | -2.25 |
| 131 | 99 | TZEEIOR 142 × TZEEIOR 249 | -2.27 |
| 132 | 63 | TZEEIOR 142 × TZEEIOR 97 | -2.3 |
| 133 | 101 | TZEEIOR 349 ×TZEEIOR 249 | -2.32 |
| 134 | 140 | TZEEIOR 526 × TZEEIOR 197 | -2.53 |
| 135 | 103 | TZEEIOR 486 × TZEEIOR 249 | -2.78 |
| 136 | 184 | TZEEIOR 30 × TZEEIOR 9 A | -2.83 |
| 137 | 61 | TZEEIOR 209 × TZEEIOR 97 | -2.88 |
| 138 | 117 | TZEEIOR 515 × TZEEIOR 197 | -2.99 |
| 139 | 42 | TZEEIOR 289 × TZEEIOR 97 | -3 |
| 140 | 125 | TZEEIOR 542 TZEEIOR 197 | -3.05 |
| 141 | 13 | TZEEIOR 509 × TZEEIOR 9 A | -3.18 |
| 142 | 160 | TZEEIOR 548 × TZEEIOR 30 | -3.34 |
| 143 | 43 | TZEEIOR 365 × TZEEIOR 97 | -3.35 |
| 144 | 40 | TZEEIOR 396 × TZEEIOR 97 | -3.42 |
| 145 | 181 | TZEEIOR 30 × TZEEIOR 97 | -3.44 |
| 146 | 126 | TZEEIOR 500 × TZEEIOR 197 | -3.45 |
| 147 | 161 | TZEEIOR 523 × TZEEIOR 30 | -3.53 |
| 148 | 87 | TZEEIOR 548 × TZEEIOR 249 | -3.56 |
| 149 | 32 | TZEEIOR 526 × TZEEIOR 9 A | -3.91 |
| 150 | 113 | TZEEIOR 384 ×TZEEIOR 197 | -3.94 |
| 151 | 8 | TZEEIOR 290 × TZEEIOR 9 A | -4.35 |
| 152 | 100 | TZEEIOR 381 × TZEEIOR 249 | -4.44 |
| 153 | 71 | TZEEIOR 546 × TZEEIOR 97 | -4.57 |
| 154 | 6 | TZEEIOR 289 × TZEEIOR 9 A | -4.67 |
| 155 | 37 | TZEEIOR 346 × TZEEIOR 97 | -4.88 |
| 156 | 59 | TZEEIOR 41 × TZEEEIOR 97 | -4.92 |
| 157 | 115 | TZEEIOR 365 × TZEEIOR 197 | -4.99 |
| 158 | 25 | TZEEIOR 209 × TZEEIOR 9 A | -5.03 |
| 159 | 7 | TZEEIOR 365 × TZEEIOR 9 A | -5.09 |
| 160 | 15 | TZEEIOR 548 × TZEEIOR 9 A | -5.75 |
| 161 | 4 | TZEEIOR 396 × TZEEIOR 9 A | -5.82 |
| 162 | 171 | TZEEIOR 221 × TZEEIOR 30 | -5.91 |
| 163 | 133 | TZEEIOR 209 × TZEEIOR 197 | -6.08 |
| 164 | 53 | TZEEIOR 542 TZEEIOR 97 | -6.29 |
| 165 | 51 | TZEEIOR 548 × TZEEIOR 97 | -6.38 |
| 166 | 64 | TZEEIOR 381 × TZEEIOR 97 | -6.96 |
| 167 | 132 | TZEEIOR 45 × TZEE OR 197 | -6.96 |
| 168 | 62 | TZEEIOR 221 × TZEEIOR 97 | -7.11 |
| 169 | 107 | TZEEIOR 546 × TZEEIOR 249 | -7.18 |
| 170 | 127 | TZEEIOR 202 × TZEEIOR 197 | -7.18 |
| 171 | 9 | TZEEIOR 515 × TZEEIOR 9 A | -7.33 |
| 172 | 148 | TZEEIOR 396 × TZEEIOR 30 | -8.01 |
| 173 | 58 | TZEEIOR 28 × TZEEIOR 97 | -8.06 |
| 174 | 60 | TZEEIOR 45 × TZEEIOR 97 | -8.16 |
| 175 | 33 | TZEEIOR 525 × TZEEIOR 9 A | -8.88 |
| 176 | 36 | TZEEIOR 305 × TZEEIOR 9 A | -9.18 |
| 177 | 174 | TZEEIOR 349 ×TZEEIOR 30 | -9.26 |
| 178 | 5 | TZEEIOR 384 ×TZEEIOR 9 A | -9.36 |
| 179 | 17 | TZEEIOR 542 TZEEIOR 9 A | -9.47 |
| 180 | 12 | TZEEIOR 513 × TZEEIOR 9 A | -9.71 |
| 181 | 30 | TZEEIOR 536 × TZEEIOR 9 A | -10.04 |
| 182 | 31 | TZEEIOR 486 × TZEEIOR 9 A | -10.46 |
| 183 | 28 | TZEEIOR 381 × TZEEIOR 9 A | -10.88 |
| 184 | 72 | TZEEIOR 305 × TZEEIOR 97 | -11.58 |
| 185 | 195 | CHECK 5 - TZEEIOR 12 × TZEEIOR 223 | -11.78 |
| 186 | 18 | TZEEIOR 500 × TZEEIOR 9 A | -12.52 |
| 187 | 2 | TZEEIOR 321 × TZEEIOR 9 A | -12.63 |
| 188 | 16 | TZEEIOR 523 × TZEEIOR 9 A | -13.75 |
| 189 | 167 | TZEEIOR 28 × TZEEIOR 30 | -14.17 |
| 190 | 65 | TZEEIOR 349 ×TZEEIOR 97 | -14.22 |
| 191 | 29 | TZEEIOR 349 ×TZEEIOR 9 A | -14.52 |
| 192 | 69 | TZEEIOR 525 × TZEEIOR 97 | -15.17 |
| 193 | 169 | TZEEIOR 45 × TZEE OR 30 | -17.58 |
| 194 | 26 | TZEEIOR 221 × TZEEIOR 9 A | -18.78 |
| 195 | 166 | TZEEIOR 24 × TZEEIOR 30 | -18.83 |
| 196 | 168 | TZEEIOR 41 × TZEEEIOR 30 | -19.53 |

MBI: multiple trait base index

Table S4: Grain yield performance of 196 hybrids evaluated under managed drought and well-watered conditions at Ikenne during 2021-2022 and 2022-2023 dry season and 2022 and 2023 main season

|  |  |  |  |
| --- | --- | --- | --- |
| Entries | Hybrids | Grain yield (kg/ha) | |
| managed drought | well-watered |
| 168 | TZEEIOR 41 × TZEEEIOR 30 | 198.22 | 1824.96 |
| 166 | TZEEIOR 24 × TZEEIOR 30 | 364.53 | 2443.29 |
| 169 | TZEEIOR 45 × TZEE OR 30 | 508.99 | 1328.78 |
| 26 | TZEEIOR 221 × TZEEIOR 9 A | 653.19 | 4973.15 |
| 167 | TZEEIOR 28 × TZEEIOR 30 | 657.07 | 1251.15 |
| 58 | TZEEIOR 28 × TZEEIOR 97 | 935.36 | 3735.69 |
| 60 | TZEEIOR 45 × TZEEIOR 97 | 974.87 | 4374.19 |
| 29 | TZEEIOR 349 ×TZEEIOR 9 A | 1033.36 | 4716.99 |
| 195 | CHECK 5 - TZEEIOR 12 × TZEEIOR 223 | 1113.66 | 5731.83 |
| 59 | TZEEIOR 41 × TZEEEIOR 97 | 1127.34 | 3675.55 |
| 28 | TZEEIOR 381 × TZEEIOR 9 A | 1127.99 | 5008.63 |
| 127 | TZEEIOR 202 × TZEEIOR 197 | 1229.4 | 4232.97 |
| 31 | TZEEIOR 486 × TZEEIOR 9 A | 1247.4 | 5114.9 |
| 16 | TZEEIOR 523 × TZEEIOR 9 A | 1260.8 | 5497.54 |
| 133 | TZEEIOR 209 × TZEEIOR 197 | 1313.55 | 6029.2 |
| 2 | TZEEIOR 321 × TZEEIOR 9 A | 1325.1 | 4354.65 |
| 17 | TZEEIOR 542 TZEEIOR 9 A | 1336.52 | 4913.74 |
| 25 | TZEEIOR 209 × TZEEIOR 9 A | 1337.7 | 6892.2 |
| 107 | TZEEIOR 546 × TZEEIOR 249 | 1362.82 | 5713.03 |
| 62 | TZEEIOR 221 × TZEEIOR 97 | 1367.15 | 5496.66 |
| 69 | TZEEIOR 525 × TZEEIOR 97 | 1375.97 | 5985.97 |
| 132 | TZEEIOR 45 × TZEE OR 197 | 1410.69 | 5959.58 |
| 171 | TZEEIOR 221 × TZEEIOR 30 | 1411.93 | 6031.58 |
| 130 | TZEEIOR 28 × TZEEIOR 197 | 1430.01 | 4595.41 |
| 72 | TZEEIOR 305 × TZEEIOR 97 | 1459.64 | 6597.91 |
| 174 | TZEEIOR 349 ×TZEEIOR 30 | 1479.28 | 5377.24 |
| 65 | TZEEIOR 349 ×TZEEIOR 97 | 1534.59 | 5131.68 |
| 148 | TZEEIOR 396 × TZEEIOR 30 | 1555.16 | 5356.03 |
| 61 | TZEEIOR 209 × TZEEIOR 97 | 1559.35 | 5573.76 |
| 139 | TZEEIOR 486 × TZEEIOR 197 | 1563.48 | 6175.33 |
| 12 | TZEEIOR 513 × TZEEIOR 9 A | 1571.96 | 5210.66 |
| 21 | TZEEIOR 24 × TZEEIOR 9 A | 1602.87 | 5379.79 |
| 30 | TZEEIOR 536 × TZEEIOR 9 A | 1603.65 | 4884.47 |
| 181 | TZEEIOR 30 × TZEEIOR 97 | 1621.49 | 5031.49 |
| 51 | TZEEIOR 548 × TZEEIOR 97 | 1626.13 | 5059.35 |
| 193 | CHECK 3 - TZEEIY Pop STR C5 × TZEEI 58 | 1645.14 | 5415.24 |
| 126 | TZEEIOR 500 × TZEEIOR 197 | 1649.88 | 5793.58 |
| 91 | TZEEIOR 202 × TZEEIOR 249 | 1661.4 | 5941.13 |
| 99 | TZEEIOR 142 × TZEEIOR 249 | 1680.12 | 6086.11 |
| 33 | TZEEIOR 525 × TZEEIOR 9 A | 1683.34 | 5371.22 |
| 172 | TZEEIOR 142 × TZEEIOR 30 | 1705.87 | 6053.82 |
| 18 | TZEEIOR 500 × TZEEIOR 9 A | 1708.1 | 4316.87 |
| 113 | TZEEIOR 384 ×TZEEIOR 197 | 1712.46 | 6825.93 |
| 196 | CHECK 6 -TZdEEI 1 × TZdEEI 12 | 1745.76 | 1566.51 |
| 117 | TZEEIOR 515 × TZEEIOR 197 | 1756.67 | 6776.22 |
| 55 | TZEEIOR 202 × TZEEIOR 97 | 1758.75 | 6249 |
| 183 | TZEEIOR 30 × TZEEIOR 249 | 1791.15 | 5452.96 |
| 36 | TZEEIOR 305 × TZEEIOR 9 A | 1801.15 | 4068.18 |
| 5 | TZEEIOR 384 ×TZEEIOR 9 A | 1802.37 | 4850.13 |
| 40 | TZEEIOR 396 × TZEEIOR 97 | 1820.7 | 5112.46 |
| 103 | TZEEIOR 486 × TZEEIOR 249 | 1845.42 | 6177.58 |
| 87 | TZEEIOR 548 × TZEEIOR 249 | 1852.08 | 5753.19 |
| 7 | TZEEIOR 365 × TZEEIOR 9 A | 1853.71 | 4960.96 |
| 15 | TZEEIOR 548 × TZEEIOR 9 A | 1858.75 | 5044.23 |
| 161 | TZEEIOR 523 × TZEEIOR 30 | 1860.33 | 6399.62 |
| 13 | TZEEIOR 509 × TZEEIOR 9 A | 1860.69 | 4587.43 |
| 63 | TZEEIOR 142 × TZEEIOR 97 | 1870.73 | 5826.36 |
| 163 | TZEEIOR 500 × TZEEIOR 30 | 1873.33 | 5231.78 |
| 45 | TZEEIOR 515 × TZEEIOR 97 | 1884.32 | 6706.66 |
| 129 | TZEEIOR 24 × TZEEIOR 197 | 1886.22 | 5364.96 |
| 94 | TZEEIOR 28 × TZEEIOR 249 | 1893.99 | 3907.16 |
| 137 | TZEEIOR 349 ×TZEEIOR 197 | 1902.6 | 6032.11 |
| 101 | TZEEIOR 349 ×TZEEIOR 249 | 1915.2 | 5189.64 |
| 97 | TZEEIOR 209 × TZEEIOR 249 | 1919.1 | 4455.26 |
| 170 | TZEEIOR 209 × TZEEIOR 30 | 1926.02 | 4270.6 |
| 32 | TZEEIOR 526 × TZEEIOR 9 A | 1926.94 | 4347.03 |
| 194 | CHECH 4 - TZdEEI 1 × TZdEEI 5 | 1929.81 | 4270.19 |
| 44 | TZEEIOR 290 × TZEEIOR 97 | 1940.09 | 5915.99 |
| 3 | TZEEIOR 314 × TZEEIOR 9 A | 1946.98 | 5066.15 |
| 122 | TZEEIOR 540 × TZEEIOR 197 | 1948.14 | 6576.01 |
| 95 | TZEEIOR 41 × TZEEEIOR 249 | 1972.04 | 4813.1 |
| 125 | TZEEIOR 542 TZEEIOR 197 | 1973.79 | 7187.5 |
| 93 | TZEEIOR 24 × TZEEIOR 249 | 1988.74 | 4367.42 |
| 184 | TZEEIOR 30 × TZEEIOR 9 A | 1996.87 | 5200.02 |
| 8 | TZEEIOR 290 × TZEEIOR 9 A | 2012.07 | 4894.5 |
| 89 | TZEEIOR 542 TZEEIOR 249 | 2018.29 | 5331.58 |
| 188 | TZEEIOR 197 × TZEEIOR 9A | 2026 | 5183.16 |
| 23 | TZEEIOR 41 × TZEEEIOR 9 A | 2029.03 | 5083.29 |
| 134 | TZEEIOR 221 × TZEEIOR 197 | 2029.28 | 6500.24 |
| 64 | TZEEIOR 381 × TZEEIOR 97 | 2037.37 | 4832.9 |
| 34 | TZEEIOR 510 × TZEEIOR 9 A | 2046.81 | 5225.35 |
| 186 | TZEEIOR 97 × TZEEIOR 249 | 2046.81 | 3280.3 |
| 123 | TZEEIOR 548 × TZEEIOR 197 | 2048.22 | 6213.41 |
| 115 | TZEEIOR 365 × TZEEIOR 197 | 2053.48 | 6360.64 |
| 37 | TZEEIOR 346 × TZEEIOR 97 | 2067.77 | 4809.46 |
| 108 | TZEEIOR 305 × TZEEIOR 249 | 2074.05 | 5426.58 |
| 191 | CHECK 1 TZEEIOR 109 × TZdEEI 12 | 2074.39 | 5271.48 |
| 140 | TZEEIOR 526 × TZEEIOR 197 | 2077.97 | 6045.97 |
| 6 | TZEEIOR 289 × TZEEIOR 9 A | 2080.29 | 5423.94 |
| 35 | TZEEIOR 546 × TZEEIOR 9 A | 2081.42 | 5253.2 |
| 160 | TZEEIOR 548 × TZEEIOR 30 | 2082.03 | 5776.17 |
| 43 | TZEEIOR 365 × TZEEIOR 97 | 2087.35 | 5795.26 |
| 177 | TZEEIOR 526 × TZEEIOR 30 | 2091.35 | 5912.97 |
| 182 | TZEEIOR 30 × TZEEIOR 197 | 2093.71 | 5437.88 |
| 180 | TZEEIOR 546 × TZEEIOR 30 | 2095.2 | 7249.23 |
| 154 | TZEEIOR 515 × TZEEIORV 30 | 2096.38 | 6130.94 |
| 19 | TZEEIOR 202 × TZEEIOR 9 A | 2098.17 | 6714.28 |
| 42 | TZEEIOR 289 × TZEEIOR 97 | 2098.93 | 7088.25 |
| 131 | TZEEIOR 41 × TZEEEIOR 197 | 2107.18 | 5130.07 |
| 187 | TZEEIOR 97 × TZEEIOR 9 A | 2109.45 | 5033.37 |
| 77 | TZEEIOR 384 ×TZEEIOR 249 | 2115.28 | 5031.59 |
| 4 | TZEEIOR 396 × TZEEIOR 9 A | 2121.11 | 5301.57 |
| 20 | TZEEIOR 205 × TZEEIOR 9 A | 2121.72 | 5347.56 |
| 9 | TZEEIOR 515 × TZEEIOR 9 A | 2124.94 | 4524.61 |
| 96 | TZEEIOR 45 × TZEEIOR 249 | 2127.52 | 4441.89 |
| 162 | TZEEIOR 542 TZEEIOR 30 | 2130.32 | 6594.61 |
| 67 | TZEEIOR 486 × TZEEIOR 97 | 2136.38 | 6405.55 |
| 90 | TZEEIOR 500 × TZEEIOR 249 | 2146.55 | 6351.28 |
| 56 | TZEEIOR 205 × TZEEIOR 97 | 2146.97 | 6735.32 |
| 98 | TZEEIOR 221 × TZEEIOR 249 | 2156.96 | 5186.18 |
| 100 | TZEEIOR 381 × TZEEIOR 249 | 2170.14 | 4870.87 |
| 53 | TZEEIOR 542 TZEEIOR 97 | 2173.39 | 7304.07 |
| 79 | TZEEIOR 365 × TZEEIOR 249 | 2177.7 | 6060.89 |
| 138 | TZEEIOR 536 × TZEEIOR 197 | 2179.68 | 6464.66 |
| 136 | TZEEIOR 381 × TZEEIOR 197 | 2208.73 | 7060.27 |
| 66 | TZEEIOR 536 × TZEEIOR 97 | 2211.03 | 6251.63 |
| 78 | TZEEIOR 289 × TZEEIOR 249 | 2235.42 | 5270.06 |
| 105 | TZEEIOR 525 × TZEEIOR 249 | 2241.61 | 4570.43 |
| 84 | TZEEIOR 513 × TZEEIOR 249 | 2242.82 | 4932.61 |
| 49 | TZEEIOR 509 × TZEEIOR 97 | 2248.02 | 6681.76 |
| 116 | TZEEIOR 290 × TZEEIOR 197 | 2257.64 | 7350.72 |
| 124 | TZEEIOR 523 × TZEEIOR 197 | 2258.81 | 6697.25 |
| 1 | TZEEIOR 346 × TZEEIOR 9 A | 2277.42 | 4927.72 |
| 88 | TZEEIOR 523 × TZEEIOR 249 | 2289.71 | 4603.36 |
| 164 | TZEEIOR 202 × TZEEIOR 30 | 2297.08 | 4917.55 |
| 141 | TZEEIOR 525 × TZEEIOR 197 | 2299.27 | 6422.35 |
| 71 | TZEEIOR 546 × TZEEIOR 97 | 2299.37 | 7426.78 |
| 189 | TZEEIOR 197 × TZEEIOR 249 | 2299.81 | 5464.1 |
| 156 | TZEEIOR 479 × TZEEIOR 30 | 2305.94 | 5935.43 |
| 128 | TZEEIOR 205 × TZEEIOR 197 | 2308.17 | 5989.75 |
| 27 | TZEEIOR 142 × TZEEIOR 9 A | 2312.23 | 5208.35 |
| 112 | TZEEIOR 396 × TZEEIOR 197 | 2333.8 | 7437.02 |
| 176 | TZEEIOR 486 × TZEEIOR 30 | 2335.76 | 4147.16 |
| 102 | TZEEIOR 536 × TZEEIOR 249 | 2340.93 | 6194.54 |
| 165 | TZEEIOR 205 × TZEEIOR 30 | 2359.71 | 6279.68 |
| 151 | TZEEIOR 365 × TZEEIOR 30 | 2367.76 | 6024.76 |
| 146 | TZEEIOR 321 × TZEEIOR 30 | 2401.44 | 5596.57 |
| 76 | TZEEIOR 396 × TZEEIOR 249 | 2409.24 | 5721.09 |
| 111 | TZEEIOR 314 × TZEEIOR 197 | 2412.94 | 5529.33 |
| 157 | TZEEIOR 513 × TZEEIOR 30 | 2425.89 | 5516.58 |
| 109 | TZEEIOR 346 × TZEEIOR 197 | 2438.1 | 6397.55 |
| 14 | TZEEIOR 540 × TZEEIOR 9 A | 2448.8 | 4577.73 |
| 155 | TZEEIOR 458 × TZEEIOR 30 | 2453.72 | 4535.2 |
| 73 | TZEEIOR 346 × TZEEIOR 249 | 2456.44 | 5105.66 |
| 153 | TZEEIOR 290 × TZEEIOR 30 | 2467.47 | 6635.53 |
| 150 | TZEEIOR 289 × TZEEIOR 30 | 2471.75 | 6488.98 |
| 185 | TZEEIOR 97 × TZEEIOR 197 | 2481.4 | 6065.87 |
| 82 | TZEEIOR 458 × TZEEIOR 249 | 2494.72 | 5173.65 |
| 46 | TZEEIOR 458 × TZEEIOR 97 | 2498.29 | 6607.95 |
| 22 | TZEEIOR 28 × TZEEIOR 9 A | 2501.02 | 5341.02 |
| 57 | TZEEIOR 24 × TZEEIOR 97 | 2502.56 | 4392.24 |
| 41 | TZEEIOR 384 ×TZEEIOR 97 | 2504.1 | 6101.5 |
| 145 | TZEEIOR 346 × TZEEIOR 30 | 2533.34 | 6123.53 |
| 143 | TZEEIOR 546 × TZEEIOR 197 | 2540.66 | 6534.09 |
| 24 | TZEEIOR 45 × TZEEIOR 9 A | 2543.12 | 5637.36 |
| 104 | TZEEIOR 526 × TZEEIOR 249 | 2557.28 | 5800.14 |
| 92 | TZEEIOR 205 × TZEEIOR 249 | 2558.98 | 5240.41 |
| 135 | TZEEIOR 142 × TZEEIOR 197 | 2578.45 | 5953.68 |
| 80 | TZEEIOR 290 × TZEEIOR 249 | 2601.6 | 5655.67 |
| 85 | TZEEIOR 509 × TZEEIOR 249 | 2602.56 | 5992.04 |
| 142 | TZEEIOR 510 × TZEEIOR 197 | 2628.79 | 7050.98 |
| 144 | TZEEIOR 305 × TZEEIOR 197 | 2648.3 | 5885.05 |
| 48 | TZEEIOR 513 × TZEEIOR 97 | 2686.68 | 5986.77 |
| 38 | TZEEIOR 321 × TZEEIOR 97 | 2690.14 | 6331.05 |
| 75 | TZEEIOR 314 × TZEEIOR 249 | 2696.18 | 5476.2 |
| 83 | TZEEIOR 479 × TZEEIOR 249 | 2714.97 | 5521.17 |
| 50 | TZEEIOR 540 × TZEEIOR 97 | 2717.56 | 7057.71 |
| 11 | TZEEIOR 479 × TZEEIOR 9 A | 2722.54 | 5092.78 |
| 152 | TZEEIOR 305 × TZEEIOR 30 | 2730.79 | 5676.38 |
| 54 | TZEEIOR 500 × TZEEIOR 97 | 2762.46 | 6097.54 |
| 190 | TZEEIOR 249 × TZEEIOR 9 A | 2780.56 | 4348 |
| 120 | TZEEIOR 513 × TZEEIOR 197 | 2799.11 | 6953.46 |
| 10 | TZEEIOR 458 × TZEEIOR 9 A | 2833.6 | 4969 |
| 47 | TZEEIOR 479 × TZEEIOR 97 | 2857.75 | 5247.55 |
| 114 | TZEEIOR 289 × TZEEIOR 197 | 2873.28 | 7341.28 |
| 81 | TZEEIOR 515 × TZEEIOR 249 | 2917.19 | 6722.3 |
| 86 | TZEEIOR 540 × TZEEIOR 249 | 2922.97 | 5818.24 |
| 147 | TZEEIOR 314 × TZEEIOR 30 | 2938.6 | 6132.9 |
| 173 | TZEEIOR 381 × TZEEIOR 30 | 2999.96 | 5897.69 |
| 192 | CHECK 2 - TZEEI 79 × TZEEI 82 | 3015.16 | 4720.41 |
| 52 | TZEEIOR 523 × TZEEIOR 97 | 3054.03 | 6385.56 |
| 119 | TZEEIOR 479 × TZEEIOR 197 | 3073.8 | 6428.36 |
| 158 | TZEEIOR 509 × TZEEIOR 30 | 3096.97 | 5469.03 |
| 110 | TZEEIOR 321 × TZEEIOR 197 | 3116.3 | 5714.04 |
| 74 | TZEEIOR 321 × TZEEIOR 249 | 3207.81 | 4918.39 |
| 178 | TZEEIOR 525 × TZEEIOR 30 | 3217.1 | 5617.52 |
| 159 | TZEEIOR 540 × TZEEIOR 30 | 3261.14 | 7086.18 |
| 106 | TZEEIOR 510 × TZEEIOR 249 | 3294.78 | 5845.61 |
| 68 | TZEEIOR 526 × TZEEIOR 97 | 3318.75 | 6435.87 |
| 149 | TZEEIOR 384 ×TZEEIOR 30 | 3414.92 | 6752.58 |
| 175 | TZEEIOR 536 × TZEEIOR 30 | 3498.09 | 7390.22 |
| 70 | TZEEIOR 510 × TZEEIOR 97 | 3568.91 | 7379.62 |
| 39 | TZEEIOR 314 × TZEEIOR 97 | 3604.17 | 6993.1 |
| 118 | TZEEIOR 458 × TZEEIOR 197 | 3642.91 | 7062.23 |
| 179 | TZEEIOR 510 × TZEEIOR 30 | 3805.47 | 6392.13 |
| 121 | TZEEIOR 509 × TZEEIOR 197 | 4044.13 | 7454.93 |

MGIDI : Multi-Trait Genotype-Ideotype Distance Index

Table S5: traits reduction under managed drought compared to that under well-watered conditions

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Entry | Hybrids | GY\_WW | MD\_GY | GY\_RED | WW\_ASI | MD\_ASI | ASI\_RED | WW\_EPP | MD\_EPP | EPP\_red | WW\_PASP | MD\_PASP | PASP\_RED | WW\_EASP | MD\_EASP | EASP\_RED |
| 1 | TZEEIOR 346 × TZEEIOR 9 A | 4927.72 | 2277.42 | 53.78 | 0.50 | 0.50 | 0.00 | 0.92 | 0.73 | 20.65 | 4.66 | 5.30 | -13.73 | 5.00 | 5.25 | -5.00 |
| 2 | TZEEIOR 321 × TZEEIOR 9 A | 4354.65 | 1325.10 | 69.57 | 0.50 | 3.06 | -512.00 | 0.93 | 0.61 | 34.41 | 4.54 | 6.36 | -40.09 | 4.50 | 6.00 | -33.33 |
| 3 | TZEEIOR 314 × TZEEIOR 9 A | 5066.15 | 1946.98 | 61.57 | 0.25 | 0.53 | -112.00 | 0.92 | 0.79 | 14.13 | 4.51 | 5.66 | -25.50 | 4.75 | 5.25 | -10.53 |
| 4 | TZEEIOR 396 × TZEEIOR 9 A | 5301.57 | 2121.11 | 59.99 | 0.00 | 0.74 | -0.74 | 0.94 | 0.65 | 30.85 | 4.57 | 6.12 | -33.92 | 4.75 | 5.25 | -10.53 |
| 5 | TZEEIOR 384 ×TZEEIOR 9 A | 4850.13 | 1802.37 | 62.84 | 0.75 | 1.79 | -138.67 | 0.94 | 0.63 | 32.98 | 4.78 | 5.71 | -19.46 | 4.75 | 6.00 | -26.32 |
| 6 | TZEEIOR 289 × TZEEIOR 9 A | 5423.94 | 2080.29 | 61.65 | 0.25 | 0.75 | -200.00 | 0.99 | 0.80 | 19.19 | 4.27 | 6.08 | -42.39 | 4.75 | 5.25 | -10.53 |
| 7 | TZEEIOR 365 × TZEEIOR 9 A | 4960.96 | 1853.71 | 62.63 | 0.50 | 2.22 | -344.00 | 0.83 | 0.75 | 9.64 | 4.97 | 5.57 | -12.07 | 4.50 | 5.50 | -22.22 |
| 8 | TZEEIOR 290 × TZEEIOR 9 A | 4894.50 | 2012.07 | 58.89 | 0.00 | 1.69 | -1.69 | 0.91 | 0.73 | 19.78 | 5.47 | 6.12 | -11.88 | 4.25 | 5.50 | -29.41 |
| 9 | TZEEIOR 515 × TZEEIOR 9 A | 4524.61 | 2124.94 | 53.04 | 0.50 | 2.19 | -338.00 | 0.86 | 0.67 | 22.09 | 5.29 | 5.79 | -9.45 | 5.50 | 5.50 | 0.00 |
| 10 | TZEEIOR 458 × TZEEIOR 9 A | 4969.00 | 2833.60 | 42.97 | 0.25 | 0.53 | -112.00 | 0.94 | 0.78 | 17.02 | 4.74 | 4.68 | 1.27 | 5.25 | 4.50 | 14.29 |
| 11 | TZEEIOR 479 × TZEEIOR 9 A | 5092.78 | 2722.54 | 46.54 | 1.00 | 0.73 | 27.00 | 0.95 | 0.84 | 11.58 | 5.04 | 5.41 | -7.34 | 5.25 | 4.50 | 14.29 |
| 12 | TZEEIOR 513 × TZEEIOR 9 A | 5210.66 | 1571.96 | 69.83 | 0.25 | 2.45 | -880.00 | 0.97 | 0.72 | 25.77 | 4.26 | 6.05 | -42.02 | 5.50 | 6.00 | -9.09 |
| 13 | TZEEIOR 509 × TZEEIOR 9 A | 4587.43 | 1860.69 | 59.44 | 0.25 | 0.94 | -276.00 | 0.88 | 0.67 | 23.86 | 4.69 | 5.23 | -11.51 | 5.25 | 5.25 | 0.00 |
| 14 | TZEEIOR 540 × TZEEIOR 9 A | 4577.73 | 2448.80 | 46.51 | 0.50 | 0.69 | -38.00 | 0.76 | 0.84 | -10.53 | 4.26 | 5.39 | -26.53 | 4.75 | 5.00 | -5.26 |
| 15 | TZEEIOR 548 × TZEEIOR 9 A | 5044.23 | 1858.75 | 63.15 | 0.50 | 1.44 | -188.00 | 0.93 | 0.65 | 30.11 | 4.71 | 5.36 | -13.80 | 5.00 | 5.00 | 0.00 |
| 16 | TZEEIOR 523 × TZEEIOR 9 A | 5497.54 | 1260.80 | 77.07 | 0.50 | 2.00 | -300.00 | 0.99 | 0.63 | 36.36 | 5.22 | 6.93 | -32.76 | 5.00 | 6.25 | -25.00 |
| 17 | TZEEIOR 542 TZEEIOR 9 A | 4913.74 | 1336.52 | 72.80 | 0.50 | 0.01 | 98.00 | 0.82 | 0.59 | 28.05 | 4.75 | 6.30 | -32.63 | 5.00 | 5.75 | -15.00 |
| 18 | TZEEIOR 500 × TZEEIOR 9 A | 4316.87 | 1708.10 | 60.43 | 0.50 | 2.30 | -360.00 | 0.97 | 0.71 | 26.80 | 5.23 | 5.87 | -12.24 | 4.50 | 5.50 | -22.22 |
| 19 | TZEEIOR 202 × TZEEIOR 9 A | 6714.28 | 2098.17 | 68.75 | 0.50 | 0.51 | -2.00 | 1.05 | 0.80 | 23.81 | 4.18 | 4.86 | -16.27 | 4.25 | 4.75 | -11.76 |
| 20 | TZEEIOR 205 × TZEEIOR 9 A | 5347.56 | 2121.72 | 60.32 | 0.25 | 1.95 | -680.00 | 0.91 | 0.78 | 14.29 | 4.20 | 5.16 | -22.86 | 4.50 | 4.75 | -5.56 |
| 21 | TZEEIOR 24 × TZEEIOR 9 A | 5379.79 | 1602.87 | 70.21 | 0.25 | 0.34 | -36.00 | 0.98 | 0.65 | 33.67 | 4.50 | 5.37 | -19.33 | 4.50 | 5.25 | -16.67 |
| 22 | TZEEIOR 28 × TZEEIOR 9 A | 5341.02 | 2501.02 | 53.17 | 0.25 | 0.98 | -292.00 | 0.98 | 0.78 | 20.41 | 4.67 | 4.54 | 2.78 | 4.75 | 4.25 | 10.53 |
| 23 | TZEEIOR 41 × TZEEEIOR 9 A | 5083.29 | 2029.03 | 60.08 | 0.50 | 0.53 | -6.00 | 0.98 | 0.66 | 32.65 | 4.05 | 5.06 | -24.94 | 5.00 | 5.25 | -5.00 |
| 24 | TZEEIOR 45 × TZEEIOR 9 A | 5637.36 | 2543.12 | 54.89 | 0.75 | 2.51 | -234.67 | 0.91 | 0.57 | 37.36 | 3.72 | 5.76 | -54.84 | 5.00 | 4.75 | 5.00 |
| 25 | TZEEIOR 209 × TZEEIOR 9 A | 6892.20 | 1337.70 | 80.59 | 0.25 | 1.26 | -404.00 | 1.07 | 0.70 | 34.58 | 3.72 | 6.26 | -68.28 | 4.50 | 6.50 | -44.44 |
| 26 | TZEEIOR 221 × TZEEIOR 9 A | 4973.15 | 653.19 | 86.87 | 0.75 | 3.97 | -429.33 | 0.91 | 0.39 | 57.14 | 4.96 | 7.04 | -41.94 | 3.75 | 7.00 | -86.67 |
| 27 | TZEEIOR 142 × TZEEIOR 9 A | 5208.35 | 2312.23 | 55.61 | 0.00 | 1.74 | -1.74 | 0.89 | 0.69 | 22.47 | 4.93 | 6.02 | -22.11 | 3.75 | 5.25 | -40.00 |
| 28 | TZEEIOR 381 × TZEEIOR 9 A | 5008.63 | 1127.99 | 77.48 | 1.25 | 0.50 | 60.00 | 0.85 | 0.53 | 37.65 | 4.75 | 6.65 | -40.00 | 5.50 | 6.25 | -13.64 |
| 29 | TZEEIOR 349 ×TZEEIOR 9 A | 4716.99 | 1033.36 | 78.09 | 0.25 | 2.30 | -820.00 | 0.86 | 0.63 | 26.74 | 5.02 | 6.57 | -30.88 | 4.75 | 6.00 | -26.32 |
| 30 | TZEEIOR 536 × TZEEIOR 9 A | 4884.47 | 1603.65 | 67.17 | 0.50 | 0.80 | -60.00 | 0.95 | 0.70 | 26.32 | 4.52 | 6.57 | -45.35 | 4.50 | 5.75 | -27.78 |
| 31 | TZEEIOR 486 × TZEEIOR 9 A | 5114.90 | 1247.40 | 75.61 | 0.50 | 1.24 | -148.00 | 0.80 | 0.57 | 28.75 | 4.24 | 6.27 | -47.88 | 4.25 | 6.25 | -47.06 |
| 32 | TZEEIOR 526 × TZEEIOR 9 A | 4347.03 | 1926.94 | 55.67 | 1.00 | 1.24 | -24.00 | 0.94 | 0.83 | 11.70 | 5.51 | 5.78 | -4.90 | 5.00 | 5.00 | 0.00 |
| 33 | TZEEIOR 525 × TZEEIOR 9 A | 5371.22 | 1683.34 | 68.66 | 0.50 | 1.17 | -134.00 | 0.95 | 0.61 | 35.79 | 4.02 | 6.15 | -52.99 | 5.00 | 6.00 | -20.00 |
| 34 | TZEEIOR 510 × TZEEIOR 9 A | 5225.35 | 2046.81 | 60.83 | 0.00 | 0.28 | -0.28 | 0.88 | 0.81 | 7.95 | 5.52 | 5.20 | 5.80 | 5.00 | 5.00 | 0.00 |
| 35 | TZEEIOR 546 × TZEEIOR 9 A | 5253.20 | 2081.42 | 60.38 | 0.25 | 0.79 | -216.00 | 0.84 | 0.78 | 7.14 | 4.20 | 4.97 | -18.33 | 5.50 | 5.50 | 0.00 |
| 36 | TZEEIOR 305 × TZEEIOR 9 A | 4068.18 | 1801.15 | 55.73 | 0.25 | 2.75 | -1000.00 | 0.89 | 0.58 | 34.83 | 5.25 | 6.15 | -17.14 | 5.75 | 6.00 | -4.35 |
| 37 | TZEEIOR 346 × TZEEIOR 97 | 4809.46 | 2067.77 | 57.01 | 0.00 | 3.10 | -3.10 | 0.80 | 0.70 | 12.50 | 3.49 | 5.02 | -43.84 | 4.50 | 5.50 | -22.22 |
| 38 | TZEEIOR 321 × TZEEIOR 97 | 6331.05 | 2690.14 | 57.51 | 0.75 | 0.48 | 36.00 | 0.91 | 0.75 | 17.58 | 3.67 | 5.29 | -44.14 | 5.25 | 4.25 | 19.05 |
| 39 | TZEEIOR 314 × TZEEIOR 97 | 6993.10 | 3604.17 | 48.46 | 0.50 | 0.77 | -54.00 | 0.96 | 0.93 | 3.12 | 5.23 | 5.51 | -5.35 | 4.50 | 4.50 | 0.00 |
| 40 | TZEEIOR 396 × TZEEIOR 97 | 5112.46 | 1820.70 | 64.39 | 0.75 | 1.74 | -132.00 | 0.98 | 0.69 | 29.59 | 4.22 | 5.75 | -36.26 | 5.00 | 5.50 | -10.00 |
| 41 | TZEEIOR 384 ×TZEEIOR 97 | 6101.50 | 2504.10 | 58.96 | 1.50 | 0.85 | 43.33 | 0.99 | 0.72 | 27.27 | 3.74 | 5.02 | -34.22 | 4.75 | 4.25 | 10.53 |
| 42 | TZEEIOR 289 × TZEEIOR 97 | 7088.25 | 2098.93 | 70.39 | 0.50 | 2.21 | -342.00 | 0.93 | 0.73 | 21.51 | 4.00 | 5.83 | -45.75 | 4.25 | 5.25 | -23.53 |
| 43 | TZEEIOR 365 × TZEEIOR 97 | 5795.26 | 2087.35 | 63.98 | 0.75 | 0.92 | -22.67 | 0.94 | 0.63 | 32.98 | 4.02 | 5.90 | -46.77 | 4.75 | 5.50 | -15.79 |
| 44 | TZEEIOR 290 × TZEEIOR 97 | 5915.99 | 1940.09 | 67.21 | 0.00 | 0.96 | -0.96 | 0.91 | 0.63 | 30.77 | 5.50 | 5.83 | -6.00 | 5.25 | 5.00 | 4.76 |
| 45 | TZEEIOR 515 × TZEEIOR 97 | 6706.66 | 1884.32 | 71.90 | 0.50 | 0.50 | 0.00 | 0.93 | 0.70 | 24.73 | 3.04 | 5.34 | -75.66 | 5.25 | 5.25 | 0.00 |
| 46 | TZEEIOR 458 × TZEEIOR 97 | 6607.95 | 2498.29 | 62.19 | 1.25 | 1.94 | -55.20 | 0.95 | 0.65 | 31.58 | 3.51 | 5.39 | -53.56 | 5.50 | 4.50 | 18.18 |
| 47 | TZEEIOR 479 × TZEEIOR 97 | 5247.55 | 2857.75 | 45.54 | 1.75 | 1.00 | 42.86 | 0.87 | 0.76 | 12.64 | 4.56 | 4.71 | -3.29 | 4.50 | 4.50 | 0.00 |
| 48 | TZEEIOR 513 × TZEEIOR 97 | 5986.77 | 2686.68 | 55.12 | 0.75 | 0.74 | 1.33 | 0.90 | 0.77 | 14.44 | 4.56 | 5.35 | -17.32 | 4.50 | 4.75 | -5.56 |
| 49 | TZEEIOR 509 × TZEEIOR 97 | 6681.76 | 2248.02 | 66.36 | 0.25 | 0.41 | -64.00 | 0.91 | 0.73 | 19.78 | 3.76 | 5.55 | -47.61 | 4.75 | 5.25 | -10.53 |
| 50 | TZEEIOR 540 × TZEEIOR 97 | 7057.71 | 2717.56 | 61.50 | 1.00 | 1.21 | -21.00 | 0.96 | 0.81 | 15.63 | 3.21 | 4.87 | -51.71 | 4.75 | 4.75 | 0.00 |
| 51 | TZEEIOR 548 × TZEEIOR 97 | 5059.35 | 1626.13 | 67.86 | 0.00 | 2.19 | -2.19 | 0.98 | 0.61 | 37.76 | 4.22 | 5.87 | -39.10 | 4.75 | 5.75 | -21.05 |
| 52 | TZEEIOR 523 × TZEEIOR 97 | 6385.56 | 3054.03 | 52.17 | 0.50 | 0.78 | -56.00 | 0.96 | 0.84 | 12.50 | 3.95 | 4.32 | -9.37 | 5.00 | 4.75 | 5.00 |
| 53 | TZEEIOR 542 TZEEIOR 97 | 7304.07 | 2173.39 | 70.24 | 0.25 | 1.71 | -584.00 | 0.94 | 0.53 | 43.62 | 3.52 | 6.10 | -73.30 | 3.25 | 5.25 | -61.54 |
| 54 | TZEEIOR 500 × TZEEIOR 97 | 6097.54 | 2762.46 | 54.70 | 0.50 | 0.75 | -50.00 | 0.99 | 0.91 | 8.08 | 4.74 | 5.56 | -17.30 | 5.00 | 5.25 | -5.00 |
| 55 | TZEEIOR 202 × TZEEIOR 97 | 6249.00 | 1758.75 | 71.86 | 0.25 | 3.50 | -1300.00 | 1.00 | 0.73 | 27.00 | 3.49 | 5.06 | -44.99 | 3.75 | 5.00 | -33.33 |
| 56 | TZEEIOR 205 × TZEEIOR 97 | 6735.32 | 2146.97 | 68.12 | 1.25 | 2.17 | -73.60 | 0.94 | 0.54 | 42.55 | 3.27 | 5.65 | -72.78 | 4.25 | 5.25 | -23.53 |
| 57 | TZEEIOR 24 × TZEEIOR 97 | 4392.24 | 2502.56 | 43.02 | 0.75 | 2.03 | -170.67 | 0.98 | 0.72 | 26.53 | 4.46 | 5.55 | -24.44 | 5.00 | 4.75 | 5.00 |
| 58 | TZEEIOR 28 × TZEEIOR 97 | 3735.69 | 935.36 | 74.96 | 0.50 | 3.76 | -652.00 | 0.93 | 0.34 | 63.44 | 4.75 | 6.10 | -28.42 | 4.50 | 6.25 | -38.89 |
| 59 | TZEEIOR 41 × TZEEEIOR 97 | 3675.55 | 1127.34 | 69.33 | 1.00 | 2.90 | -190.00 | 0.78 | 0.51 | 34.62 | 5.75 | 6.10 | -6.09 | 5.25 | 5.75 | -9.52 |
| 60 | TZEEIOR 45 × TZEEIOR 97 | 4374.19 | 974.87 | 77.71 | 0.50 | 3.45 | -590.00 | 0.85 | 0.50 | 41.18 | 4.49 | 5.75 | -28.06 | 4.50 | 6.75 | -50.00 |
| 61 | TZEEIOR 209 × TZEEIOR 97 | 5573.76 | 1559.35 | 72.02 | 0.75 | 2.26 | -201.33 | 0.84 | 0.58 | 30.95 | 3.50 | 5.71 | -63.14 | 4.25 | 5.75 | -35.29 |
| 62 | TZEEIOR 221 × TZEEIOR 97 | 5496.66 | 1367.15 | 75.13 | 0.25 | 3.49 | -1296.00 | 1.01 | 0.58 | 42.57 | 4.97 | 6.30 | -26.76 | 5.00 | 5.75 | -15.00 |
| 63 | TZEEIOR 142 × TZEEIOR 97 | 5826.36 | 1870.73 | 67.89 | 1.25 | 2.50 | -100.00 | 0.89 | 0.59 | 33.71 | 4.22 | 5.92 | -40.28 | 5.25 | 5.50 | -4.76 |
| 64 | TZEEIOR 381 × TZEEIOR 97 | 4832.90 | 2037.37 | 57.84 | 1.25 | 1.24 | 0.80 | 0.87 | 0.60 | 31.03 | 4.76 | 6.28 | -31.93 | 5.25 | 5.75 | -9.52 |
| 65 | TZEEIOR 349 ×TZEEIOR 97 | 5131.68 | 1534.59 | 70.10 | 0.50 | 1.94 | -288.00 | 0.84 | 0.51 | 39.29 | 3.48 | 7.11 | -104.31 | 5.00 | 5.75 | -15.00 |
| 66 | TZEEIOR 536 × TZEEIOR 97 | 6251.63 | 2211.03 | 64.63 | 0.50 | 1.48 | -196.00 | 0.99 | 0.64 | 35.35 | 3.74 | 5.94 | -58.82 | 4.50 | 4.75 | -5.56 |
| 67 | TZEEIOR 486 × TZEEIOR 97 | 6405.55 | 2136.38 | 66.65 | 0.25 | 1.52 | -508.00 | 0.93 | 0.54 | 41.94 | 3.50 | 5.06 | -44.57 | 4.50 | 5.00 | -11.11 |
| 68 | TZEEIOR 526 × TZEEIOR 97 | 6435.87 | 3318.75 | 48.43 | 1.00 | 1.82 | -82.00 | 0.92 | 0.72 | 21.74 | 3.41 | 4.23 | -24.05 | 4.75 | 3.75 | 21.05 |
| 69 | TZEEIOR 525 × TZEEIOR 97 | 5985.97 | 1375.97 | 77.01 | 0.25 | 2.69 | -976.00 | 0.91 | 0.49 | 46.15 | 3.94 | 7.39 | -87.56 | 4.75 | 5.75 | -21.05 |
| 70 | TZEEIOR 510 ×TZEEIOR 97 | 7379.62 | 3568.91 | 51.64 | 0.25 | 0.28 | -12.00 | 0.95 | 0.87 | 8.42 | 3.23 | 4.52 | -39.94 | 4.50 | 3.75 | 16.67 |
| 71 | TZEEIOR 546 × TZEEIOR 97 | 7426.78 | 2299.37 | 69.04 | 0.75 | 2.06 | -174.67 | 0.93 | 0.68 | 26.88 | 3.46 | 6.00 | -73.41 | 3.50 | 5.00 | -42.86 |
| 72 | TZEEIOR 305 × TZEEIOR 97 | 6597.91 | 1459.64 | 77.88 | 0.75 | 2.00 | -166.67 | 0.91 | 0.55 | 39.56 | 3.00 | 6.69 | -123.00 | 4.50 | 5.75 | -27.78 |
| 73 | TZEEIOR 346 × TZEEIOR 249 | 5105.66 | 2456.44 | 51.89 | 0.25 | 1.94 | -676.00 | 0.95 | 0.77 | 18.95 | 4.50 | 5.38 | -19.56 | 5.00 | 5.25 | -5.00 |
| 74 | TZEEIOR 321 × TZEEIOR 249 | 4918.39 | 3207.81 | 34.78 | 0.50 | 0.54 | -8.00 | 0.99 | 0.83 | 16.16 | 4.77 | 4.91 | -2.94 | 5.25 | 3.25 | 38.10 |
| 75 | TZEEIOR 314 × TZEEIOR 249 | 5476.20 | 2696.18 | 50.77 | 0.50 | 0.20 | 60.00 | 0.90 | 0.75 | 16.67 | 4.45 | 4.91 | -10.34 | 4.75 | 4.25 | 10.53 |
| 76 | TZEEIOR 396 × TZEEIOR 249 | 5721.09 | 2409.24 | 57.89 | 0.50 | 0.50 | 0.00 | 0.89 | 0.79 | 11.24 | 5.26 | 5.15 | 2.09 | 4.75 | 5.25 | -10.53 |
| 77 | TZEEIOR 384 ×TZEEIOR 249 | 5031.59 | 2115.28 | 57.96 | 0.25 | 0.19 | 24.00 | 0.86 | 0.73 | 15.12 | 4.51 | 5.06 | -12.20 | 4.25 | 5.00 | -17.65 |
| 78 | TZEEIOR 289 × TZEEIOR 249 | 5270.06 | 2235.42 | 57.58 | 0.00 | 1.01 | -1.01 | 0.85 | 0.83 | 2.35 | 5.47 | 5.06 | 7.50 | 5.00 | 5.25 | -5.00 |
| 79 | TZEEIOR 365 × TZEEIOR 249 | 6060.89 | 2177.70 | 64.07 | 0.00 | 1.03 | -1.03 | 0.97 | 0.72 | 25.77 | 4.52 | 5.01 | -10.84 | 5.00 | 4.50 | 10.00 |
| 80 | TZEEIOR 290 × TZEEIOR 249 | 5655.67 | 2601.60 | 54.00 | 0.00 | 1.95 | -1.95 | 0.81 | 0.89 | -9.88 | 5.29 | 5.29 | 0.00 | 4.75 | 5.00 | -5.26 |
| 81 | TZEEIOR 515 × TZEEIOR 249 | 6722.30 | 2917.19 | 56.60 | 1.00 | 0.48 | 52.00 | 0.98 | 0.80 | 18.37 | 3.92 | 3.96 | -1.02 | 4.75 | 4.50 | 5.26 |
| 82 | TZEEIOR 458 × TZEEIOR 249 | 5173.65 | 2494.72 | 51.78 | 0.50 | 0.31 | 38.00 | 0.90 | 0.83 | 7.78 | 5.46 | 5.25 | 3.85 | 5.50 | 4.50 | 18.18 |
| 83 | TZEEIOR 479 × TZEEIOR 249 | 5521.17 | 2714.97 | 50.83 | 0.25 | 0.52 | -108.00 | 0.93 | 0.88 | 5.38 | 5.02 | 4.62 | 7.97 | 4.75 | 4.75 | 0.00 |
| 84 | TZEEIOR 513 × TZEEIOR 249 | 4932.61 | 2242.82 | 54.53 | 0.25 | 0.72 | -188.00 | 0.94 | 0.84 | 10.64 | 5.01 | 5.93 | -18.36 | 5.00 | 5.00 | 0.00 |
| 85 | TZEEIOR 509 × TZEEIOR 249 | 5992.04 | 2602.56 | 56.57 | 0.25 | 0.60 | -140.00 | 0.89 | 0.82 | 7.87 | 5.25 | 5.04 | 4.00 | 4.75 | 5.25 | -10.53 |
| 86 | TZEEIOR 540 × TZEEIOR 249 | 5818.24 | 2922.97 | 49.76 | 0.25 | 1.48 | -492.00 | 0.95 | 0.87 | 8.42 | 4.99 | 5.19 | -4.01 | 4.75 | 4.25 | 10.53 |
| 87 | TZEEIOR 548 × TZEEIOR 249 | 5753.19 | 1852.08 | 67.81 | 0.25 | 0.77 | -208.00 | 0.81 | 0.74 | 8.64 | 5.02 | 5.05 | -0.60 | 4.25 | 5.00 | -17.65 |
| 88 | TZEEIOR 523 × TZEEIOR 249 | 4603.36 | 2289.71 | 50.26 | 0.75 | 1.01 | -34.67 | 0.91 | 0.72 | 20.88 | 5.81 | 5.48 | 5.68 | 4.50 | 4.75 | -5.56 |
| 89 | TZEEIOR 542 TZEEIOR 249 | 5331.58 | 2018.29 | 62.14 | 0.25 | 1.26 | -404.00 | 0.94 | 0.62 | 34.04 | 5.00 | 4.85 | 3.00 | 4.75 | 5.25 | -10.53 |
| 90 | TZEEIOR 500 × TZEEIOR 249 | 6351.28 | 2146.55 | 66.20 | 1.25 | 1.49 | -19.20 | 0.98 | 0.72 | 26.53 | 4.81 | 5.41 | -12.47 | 4.75 | 5.50 | -15.79 |
| 91 | TZEEIOR 202 × TZEEIOR 249 | 5941.13 | 1661.40 | 72.04 | 0.50 | 3.28 | -556.00 | 0.96 | 0.78 | 18.75 | 3.50 | 4.86 | -38.86 | 4.50 | 5.25 | -16.67 |
| 92 | TZEEIOR 205 × TZEEIOR 249 | 5240.41 | 2558.98 | 51.17 | 1.25 | 2.21 | -76.80 | 0.86 | 0.87 | -1.16 | 5.02 | 4.67 | 6.97 | 4.75 | 5.00 | -5.26 |
| 93 | TZEEIOR 24 × TZEEIOR 249 | 4367.42 | 1988.74 | 54.46 | 1.50 | 1.29 | 14.00 | 0.90 | 0.78 | 13.33 | 5.31 | 5.37 | -1.13 | 4.25 | 5.25 | -23.53 |
| 94 | TZEEIOR 28 × TZEEIOR 249 | 3907.16 | 1893.99 | 51.53 | 1.25 | 2.48 | -98.40 | 0.81 | 0.70 | 13.58 | 5.53 | 5.16 | 6.69 | 4.50 | 5.75 | -27.78 |
| 95 | TZEEIOR 41 × TZEEEIOR 249 | 4813.10 | 1972.04 | 59.03 | 0.75 | 1.69 | -125.33 | 0.93 | 0.60 | 35.48 | 4.94 | 5.23 | -5.87 | 4.50 | 5.00 | -11.11 |
| 96 | TZEEIOR 45 × TZEEIOR 249 | 4441.89 | 2127.52 | 52.10 | 1.25 | 1.54 | -23.20 | 0.80 | 0.81 | -1.25 | 5.24 | 5.18 | 1.15 | 4.00 | 5.00 | -25.00 |
| 97 | TZEEIOR 209 × TZEEIOR 249 | 4455.26 | 1919.10 | 56.93 | 0.50 | 1.44 | -188.00 | 0.93 | 0.85 | 8.60 | 5.26 | 4.89 | 7.03 | 4.75 | 5.50 | -15.79 |
| 98 | TZEEIOR 221 × TZEEIOR 249 | 5186.18 | 2156.96 | 58.41 | 0.00 | 1.85 | -1.85 | 0.94 | 0.85 | 9.57 | 4.00 | 5.32 | -33.00 | 5.25 | 4.75 | 9.52 |
| 99 | TZEEIOR 142 × TZEEIOR 249 | 6086.11 | 1680.12 | 72.39 | 0.50 | 2.21 | -342.00 | 0.93 | 0.70 | 24.73 | 4.81 | 4.74 | 1.46 | 5.00 | 5.50 | -10.00 |
| 100 | TZEEIOR 381 × TZEEIOR 249 | 4870.87 | 2170.14 | 55.45 | 0.50 | 2.00 | -300.00 | 0.84 | 0.71 | 15.48 | 5.02 | 5.48 | -9.16 | 5.50 | 5.50 | 0.00 |
| 101 | TZEEIOR 349 ×TZEEIOR 249 | 5189.64 | 1915.20 | 63.10 | 0.25 | 0.69 | -176.00 | 0.88 | 0.75 | 14.77 | 3.75 | 5.63 | -50.13 | 5.00 | 5.50 | -10.00 |
| 102 | TZEEIOR 536 × TZEEIOR 249 | 6194.54 | 2340.93 | 62.21 | 0.25 | 0.54 | -116.00 | 0.87 | 0.82 | 5.75 | 5.01 | 5.36 | -6.99 | 4.50 | 4.75 | -5.56 |
| 103 | TZEEIOR 486 × TZEEIOR 249 | 6177.58 | 1845.42 | 70.13 | 0.25 | 1.53 | -512.00 | 0.92 | 0.63 | 31.52 | 4.54 | 5.47 | -20.48 | 4.75 | 5.25 | -10.53 |
| 104 | TZEEIOR 526 × TZEEIOR 249 | 5800.14 | 2557.28 | 55.91 | 0.00 | 1.26 | -1.26 | 0.88 | 0.76 | 13.64 | 4.17 | 5.01 | -20.14 | 4.50 | 4.75 | -5.56 |
| 105 | TZEEIOR 525 × TZEEIOR 249 | 4570.43 | 2241.61 | 50.95 | 1.00 | 1.29 | -29.00 | 0.84 | 0.67 | 20.24 | 4.76 | 5.06 | -6.30 | 4.75 | 5.00 | -5.26 |
| 106 | TZEEIOR 510 × TZEEIOR 249 | 5845.61 | 3294.78 | 43.64 | 0.25 | 0.99 | -296.00 | 0.91 | 0.90 | 1.10 | 4.57 | 4.62 | -1.09 | 5.00 | 3.75 | 25.00 |
| 107 | TZEEIOR 546 × TZEEIOR 249 | 5713.03 | 1362.82 | 76.15 | 0.50 | 1.03 | -106.00 | 0.87 | 0.68 | 21.84 | 4.78 | 5.97 | -24.90 | 5.00 | 6.00 | -20.00 |
| 108 | TZEEIOR 305 × TZEEIOR 249 | 5426.58 | 2074.05 | 61.78 | 0.50 | 1.48 | -196.00 | 0.85 | 0.74 | 12.94 | 4.42 | 5.21 | -17.87 | 4.50 | 5.00 | -11.11 |
| 109 | TZEEIOR 346 × TZEEIOR 197 | 6397.55 | 2438.10 | 61.89 | 0.25 | 0.75 | -200.00 | 0.95 | 0.78 | 17.89 | 3.97 | 3.89 | 2.02 | 4.75 | 4.50 | 5.26 |
| 110 | TZEEIOR 321 × TZEEIOR 197 | 5714.04 | 3116.30 | 45.46 | 0.00 | 1.35 | -1.35 | 0.96 | 0.86 | 10.42 | 3.50 | 4.29 | -22.57 | 4.75 | 3.75 | 21.05 |
| 111 | TZEEIOR 314 × TZEEIOR 197 | 5529.33 | 2412.94 | 56.36 | 0.50 | 0.75 | -50.00 | 1.01 | 0.76 | 24.75 | 4.51 | 5.15 | -14.19 | 4.75 | 4.75 | 0.00 |
| 112 | TZEEIOR 396 × TZEEIOR 197 | 7437.02 | 2333.80 | 68.62 | 0.25 | 0.78 | -212.00 | 0.99 | 0.78 | 21.21 | 3.23 | 5.52 | -70.90 | 4.25 | 4.25 | 0.00 |
| 113 | TZEEIOR 384 ×TZEEIOR 197 | 6825.93 | 1712.46 | 74.91 | 0.50 | 1.00 | -100.00 | 0.97 | 0.55 | 43.30 | 3.57 | 5.78 | -61.90 | 4.75 | 5.00 | -5.26 |
| 114 | TZEEIOR 289 × TZEEIOR 197 | 7341.28 | 2873.28 | 60.86 | 0.25 | 2.18 | -772.00 | 0.99 | 0.86 | 13.13 | 3.47 | 4.90 | -41.21 | 4.25 | 4.50 | -5.88 |
| 115 | TZEEIOR 365 × TZEEIOR 197 | 6360.64 | 2053.48 | 67.72 | 0.75 | 2.25 | -200.00 | 0.99 | 0.68 | 31.31 | 3.81 | 6.46 | -69.55 | 4.00 | 5.00 | -25.00 |
| 116 | TZEEIOR 290 × TZEEIOR 197 | 7350.72 | 2257.64 | 69.29 | 0.50 | 1.49 | -198.00 | 0.98 | 0.73 | 25.51 | 2.99 | 5.52 | -84.62 | 4.50 | 5.25 | -16.67 |
| 117 | TZEEIOR 515 × TZEEIOR 197 | 6776.22 | 1756.67 | 74.08 | 0.25 | 0.98 | -292.00 | 0.98 | 0.66 | 32.65 | 3.07 | 5.85 | -90.55 | 4.25 | 6.00 | -41.18 |
| 118 | TZEEIOR 458 × TZEEIOR 197 | 7062.23 | 3642.91 | 48.42 | 0.25 | 0.25 | 0.00 | 0.94 | 0.90 | 4.26 | 3.71 | 3.83 | -3.23 | 3.75 | 4.25 | -13.33 |
| 119 | TZEEIOR 479 × TZEEIOR 197 | 6428.36 | 3073.80 | 52.18 | 0.75 | 0.71 | 5.33 | 0.98 | 0.86 | 12.24 | 4.28 | 4.63 | -8.18 | 4.25 | 4.25 | 0.00 |
| 120 | TZEEIOR 513 × TZEEIOR 197 | 6953.46 | 2799.11 | 59.75 | 0.50 | 1.55 | -210.00 | 0.97 | 0.80 | 17.53 | 3.76 | 5.00 | -32.98 | 4.25 | 4.75 | -11.76 |
| 121 | TZEEIOR 509 × TZEEIOR 197 | 7454.93 | 4044.13 | 45.75 | 0.25 | 1.02 | -308.00 | 0.97 | 0.98 | -1.03 | 2.77 | 4.37 | -57.76 | 4.50 | 3.50 | 22.22 |
| 122 | TZEEIOR 540 × TZEEIOR 197 | 6576.01 | 1948.14 | 70.38 | 0.50 | 1.01 | -102.00 | 1.00 | 0.74 | 26.00 | 4.08 | 5.59 | -37.01 | 4.00 | 4.75 | -18.75 |
| 123 | TZEEIOR 548 × TZEEIOR 197 | 6213.41 | 2048.22 | 67.04 | 0.25 | 1.22 | -388.00 | 0.92 | 0.72 | 21.74 | 3.76 | 5.36 | -42.55 | 4.25 | 5.50 | -29.41 |
| 124 | TZEEIOR 523 × TZEEIOR 197 | 6697.25 | 2258.81 | 66.27 | 0.75 | 0.58 | 22.67 | 0.96 | 0.86 | 10.42 | 3.76 | 5.10 | -35.64 | 3.75 | 5.00 | -33.33 |
| 125 | TZEEIOR 542 TZEEIOR 197 | 7187.50 | 1973.79 | 72.54 | 0.25 | 2.02 | -708.00 | 1.00 | 0.58 | 42.00 | 3.46 | 5.95 | -71.97 | 4.00 | 5.00 | -25.00 |
| 126 | TZEEIOR 500 × TZEEIOR 197 | 5793.58 | 1649.88 | 71.52 | 0.00 | 1.04 | -1.04 | 0.95 | 0.62 | 34.74 | 4.95 | 5.74 | -15.96 | 4.25 | 5.75 | -35.29 |
| 127 | TZEEIOR 202 × TZEEIOR 197 | 4232.97 | 1229.40 | 70.96 | 1.50 | 2.81 | -87.33 | 0.91 | 0.62 | 31.87 | 4.79 | 6.32 | -31.94 | 4.50 | 5.50 | -22.22 |
| 128 | TZEEIOR 205 × TZEEIOR 197 | 5989.75 | 2308.17 | 61.46 | 1.00 | 2.21 | -121.00 | 0.95 | 0.83 | 12.63 | 3.52 | 4.92 | -39.77 | 4.50 | 5.25 | -16.67 |
| 129 | TZEEIOR 24 × TZEEIOR 197 | 5364.96 | 1886.22 | 64.84 | 0.75 | 2.33 | -210.67 | 0.91 | 0.82 | 9.89 | 4.51 | 5.60 | -24.17 | 4.00 | 5.25 | -31.25 |
| 130 | TZEEIOR 28 × TZEEIOR 197 | 4595.41 | 1430.01 | 68.88 | 0.75 | 2.04 | -172.00 | 0.90 | 0.76 | 15.56 | 4.96 | 5.59 | -12.70 | 4.25 | 5.75 | -35.29 |
| 131 | TZEEIOR 41 × TZEEEIOR 197 | 5130.07 | 2107.18 | 58.92 | 0.75 | 3.19 | -325.33 | 0.92 | 0.77 | 16.30 | 4.23 | 4.86 | -14.89 | 4.00 | 5.00 | -25.00 |
| 132 | TZEEIOR 45 × TZEE OR 197 | 5959.58 | 1410.69 | 76.33 | 0.25 | 1.50 | -500.00 | 1.05 | 0.68 | 35.24 | 4.00 | 6.19 | -54.75 | 4.50 | 5.75 | -27.78 |
| 133 | TZEEIOR 209 × TZEEIOR 197 | 6029.20 | 1313.55 | 78.21 | 0.75 | 2.06 | -174.67 | 1.03 | 0.60 | 41.75 | 3.80 | 5.95 | -56.58 | 4.50 | 5.50 | -22.22 |
| 134 | TZEEIOR 221 × TZEEIOR 197 | 6500.24 | 2029.28 | 68.78 | 0.50 | 2.44 | -388.00 | 0.98 | 0.78 | 20.41 | 3.72 | 5.27 | -41.67 | 5.00 | 5.50 | -10.00 |
| 135 | TZEEIOR 142 × TZEEIOR 197 | 5953.68 | 2578.45 | 56.69 | 1.25 | 4.02 | -221.60 | 1.01 | 0.74 | 26.73 | 3.53 | 4.24 | -20.11 | 5.00 | 4.50 | 10.00 |
| 136 | TZEEIOR 381 × TZEEIOR 197 | 7060.27 | 2208.73 | 68.72 | 0.75 | 0.52 | 30.67 | 0.96 | 0.70 | 27.08 | 3.27 | 4.80 | -46.79 | 4.50 | 5.00 | -11.11 |
| 137 | TZEEIOR 349 ×TZEEIOR 197 | 6032.11 | 1902.60 | 68.46 | 0.75 | 0.74 | 1.33 | 0.97 | 0.70 | 27.84 | 4.31 | 5.66 | -31.32 | 4.00 | 5.25 | -31.25 |
| 138 | TZEEIOR 536 × TZEEIOR 197 | 6464.66 | 2179.68 | 66.28 | 0.75 | 3.03 | -304.00 | 1.01 | 0.81 | 19.80 | 4.21 | 5.80 | -37.77 | 4.75 | 4.75 | 0.00 |
| 139 | TZEEIOR 486 × TZEEIOR 197 | 6175.33 | 1563.48 | 74.68 | 1.50 | 3.04 | -102.67 | 0.92 | 0.71 | 22.83 | 3.76 | 5.45 | -44.95 | 4.00 | 5.50 | -37.50 |
| 140 | TZEEIOR 526 × TZEEIOR 197 | 6045.97 | 2077.97 | 65.63 | 1.25 | 2.27 | -81.60 | 0.97 | 0.71 | 26.80 | 3.28 | 5.85 | -78.35 | 4.50 | 5.25 | -16.67 |
| 141 | TZEEIOR 525 × TZEEIOR 197 | 6422.35 | 2299.27 | 64.20 | 1.00 | 1.29 | -29.00 | 0.97 | 0.64 | 34.02 | 3.70 | 4.97 | -34.32 | 5.25 | 4.75 | 9.52 |
| 142 | TZEEIOR 510 × TZEEIOR 197 | 7050.98 | 2628.79 | 62.72 | 0.75 | 1.24 | -65.33 | 0.98 | 0.87 | 11.22 | 3.76 | 4.57 | -21.54 | 4.75 | 4.25 | 10.53 |
| 143 | TZEEIOR 546 × TZEEIOR 197 | 6534.09 | 2540.66 | 61.12 | 0.50 | 2.26 | -352.00 | 0.97 | 0.89 | 8.25 | 2.99 | 4.79 | -60.20 | 4.00 | 5.00 | -25.00 |
| 144 | TZEEIOR 305 × TZEEIOR 197 | 5885.05 | 2648.30 | 55.00 | 0.25 | 1.04 | -316.00 | 1.00 | 0.75 | 25.00 | 4.77 | 5.21 | -9.22 | 3.75 | 4.50 | -20.00 |
| 145 | TZEEIOR 346 × TZEEIOR 30 | 6123.53 | 2533.34 | 58.63 | 1.00 | 0.80 | 20.00 | 0.98 | 0.77 | 21.43 | 4.73 | 5.37 | -13.53 | 5.00 | 5.25 | -5.00 |
| 146 | TZEEIOR 321 × TZEEIOR 30 | 5596.57 | 2401.44 | 57.09 | 1.25 | 0.71 | 43.20 | 0.89 | 0.78 | 12.36 | 4.56 | 5.24 | -14.91 | 5.50 | 4.75 | 13.64 |
| 147 | TZEEIOR 314 × TZEEIOR 30 | 6132.90 | 2938.60 | 52.08 | 0.75 | 0.60 | 20.00 | 0.90 | 0.85 | 5.56 | 4.29 | 4.97 | -15.85 | 4.75 | 4.25 | 10.53 |
| 148 | TZEEIOR 396 × TZEEIOR 30 | 5356.03 | 1555.16 | 70.96 | 1.25 | 0.46 | 63.20 | 0.93 | 0.58 | 37.63 | 4.25 | 6.40 | -50.59 | 3.75 | 5.75 | -53.33 |
| 149 | TZEEIOR 384 ×TZEEIOR 30 | 6752.58 | 3414.92 | 49.43 | 1.75 | 1.52 | 13.14 | 0.95 | 0.81 | 14.74 | 3.96 | 4.21 | -6.31 | 4.50 | 3.75 | 16.67 |
| 150 | TZEEIOR 289 × TZEEIOR 30 | 6488.98 | 2471.75 | 61.91 | 1.25 | 2.19 | -75.20 | 0.95 | 0.81 | 14.74 | 4.79 | 5.29 | -10.44 | 4.00 | 5.25 | -31.25 |
| 151 | TZEEIOR 365 × TZEEIOR 30 | 6024.76 | 2367.76 | 60.70 | 1.00 | 2.30 | -130.00 | 0.94 | 0.76 | 19.15 | 4.30 | 5.25 | -22.09 | 3.75 | 4.75 | -26.67 |
| 152 | TZEEIOR 305 × TZEEIOR 30 | 5676.38 | 2730.79 | 51.89 | 0.75 | 0.72 | 4.00 | 0.93 | 0.79 | 15.05 | 4.50 | 5.09 | -13.11 | 5.25 | 4.75 | 9.52 |
| 153 | TZEEIOR 290 × TZEEIOR 30 | 6635.53 | 2467.47 | 62.81 | 1.50 | 2.02 | -34.67 | 0.98 | 0.75 | 23.47 | 3.98 | 5.47 | -37.44 | 4.25 | 5.00 | -17.65 |
| 154 | TZEEIOR 515 × TZEEIORV 30 | 6130.94 | 2096.38 | 65.81 | 1.25 | 0.80 | 36.00 | 0.97 | 0.78 | 19.59 | 4.27 | 4.82 | -12.88 | 4.50 | 4.75 | -5.56 |
| 155 | TZEEIOR 458 × TZEEIOR 30 | 4535.20 | 2453.72 | 45.90 | 1.50 | 0.99 | 34.00 | 0.86 | 0.83 | 3.49 | 5.31 | 5.10 | 3.95 | 4.50 | 4.75 | -5.56 |
| 156 | TZEEIOR 479 × TZEEIOR 30 | 5935.43 | 2305.94 | 61.15 | 1.50 | 0.21 | 86.00 | 0.90 | 0.76 | 15.56 | 5.03 | 5.63 | -11.93 | 4.75 | 5.00 | -5.26 |
| 157 | TZEEIOR 513 × TZEEIOR 30 | 5516.58 | 2425.89 | 56.03 | 1.25 | 1.06 | 15.20 | 0.91 | 0.69 | 24.18 | 4.50 | 5.95 | -32.22 | 4.50 | 4.75 | -5.56 |
| 158 | TZEEIOR 509 × TZEEIOR 30 | 5469.03 | 3096.97 | 43.37 | 0.75 | 1.78 | -137.33 | 0.90 | 0.77 | 14.44 | 4.47 | 4.42 | 1.12 | 5.25 | 4.25 | 19.05 |
| 159 | TZEEIOR 540 × TZEEIOR 30 | 7086.18 | 3261.14 | 53.98 | 1.00 | 0.73 | 27.00 | 1.00 | 0.87 | 13.00 | 4.07 | 4.35 | -6.88 | 3.75 | 3.50 | 6.67 |
| 160 | TZEEIOR 548 × TZEEIOR 30 | 5776.17 | 2082.03 | 63.95 | 0.50 | 0.97 | -94.00 | 0.95 | 0.67 | 29.47 | 4.96 | 5.68 | -14.52 | 5.25 | 5.00 | 4.76 |
| 161 | TZEEIOR 523 × TZEEIOR 30 | 6399.62 | 1860.33 | 70.93 | 0.75 | 1.58 | -110.67 | 0.97 | 0.80 | 17.53 | 5.19 | 6.11 | -17.73 | 4.75 | 5.50 | -15.79 |
| 162 | TZEEIOR 542 × TZEEIOR 30 | 6594.61 | 2130.32 | 67.70 | 1.00 | 1.00 | 0.00 | 0.89 | 0.61 | 31.46 | 4.49 | 4.56 | -1.56 | 5.00 | 5.25 | -5.00 |
| 163 | TZEEIOR 500 × TZEEIOR 30 | 5231.78 | 1873.33 | 64.19 | 1.50 | 1.29 | 14.00 | 0.94 | 0.67 | 28.72 | 5.20 | 4.99 | 4.04 | 5.00 | 5.25 | -5.00 |
| 164 | TZEEIOR 202 × TZEEIOR 30 | 4917.55 | 2297.08 | 53.29 | 0.00 | 2.19 | -2.19 | 0.93 | 0.82 | 11.83 | 5.21 | 4.36 | 16.31 | 5.00 | 4.50 | 10.00 |
| 165 | TZEEIOR 205 × TZEEIOR 30 | 6279.68 | 2359.71 | 62.42 | 0.50 | 1.74 | -248.00 | 0.93 | 0.72 | 22.58 | 3.93 | 5.52 | -40.46 | 4.00 | 5.00 | -25.00 |
| 166 | TZEEIOR 24 × TZEEIOR 30 | 2443.29 | 364.53 | 85.08 | 0.75 | 1.52 | -102.67 | 0.95 | 0.32 | 66.32 | 6.46 | 6.50 | -0.62 | 5.50 | 6.50 | -18.18 |
| 167 | TZEEIOR 28 × TZEEIOR 30 | 1251.15 | 657.07 | 47.48 | 1.25 | 2.69 | -115.20 | 0.44 | 0.35 | 20.45 | 5.69 | 6.89 | -21.09 | 6.25 | 6.50 | -4.00 |
| 168 | TZEEIOR 41 × TZEEEIOR 30 | 1824.96 | 198.22 | 89.14 | 1.75 | 3.58 | -104.57 | 0.74 | 0.31 | 58.11 | 6.72 | 6.74 | -0.30 | 5.50 | 7.00 | -27.27 |
| 169 | TZEEIOR 45 × TZEEIOR 30 | 1328.78 | 508.99 | 61.69 | 1.00 | 2.78 | -178.00 | 0.70 | 0.39 | 44.29 | 6.53 | 6.72 | -2.91 | 5.50 | 7.00 | -27.27 |
| 170 | TZEEIOR 209 × TZEEIOR 30 | 4270.60 | 1926.02 | 54.90 | 0.75 | 1.93 | -157.33 | 0.92 | 0.69 | 25.00 | 4.97 | 5.65 | -13.68 | 5.00 | 6.00 | -20.00 |
| 171 | TZEEIOR 221 × TZEEIOR 30 | 6031.58 | 1411.93 | 76.59 | 0.25 | 2.66 | -964.00 | 0.89 | 0.59 | 33.71 | 4.72 | 5.80 | -22.88 | 4.75 | 5.50 | -15.79 |
| 172 | TZEEIOR 142 × TZEEIOR 30 | 6053.82 | 1705.87 | 71.82 | 0.50 | 3.00 | -500.00 | 0.95 | 0.61 | 35.79 | 4.32 | 5.53 | -28.01 | 4.25 | 5.50 | -29.41 |
| 173 | TZEEIOR 381 × TZEEIOR 30 | 5897.69 | 2999.96 | 49.13 | 0.75 | 0.78 | -4.00 | 0.89 | 0.70 | 21.35 | 5.00 | 4.61 | 7.80 | 5.00 | 5.00 | 0.00 |
| 174 | TZEEIOR 349 ×TZEEIOR 30 | 5377.24 | 1479.28 | 72.49 | 0.50 | 0.75 | -50.00 | 0.97 | 0.64 | 34.02 | 5.04 | 6.55 | -29.96 | 4.00 | 6.00 | -50.00 |
| 175 | TZEEIOR 536 × TZEEIOR 30 | 7390.22 | 3498.09 | 52.67 | 0.50 | 2.63 | -426.00 | 0.99 | 0.75 | 24.24 | 4.26 | 5.25 | -23.24 | 4.50 | 4.50 | 0.00 |
| 176 | TZEEIOR 486 × TZEEIOR 30 | 4147.16 | 2335.76 | 43.68 | 0.25 | 1.33 | -432.00 | 0.86 | 0.72 | 16.28 | 3.72 | 5.19 | -39.52 | 5.25 | 5.00 | 4.76 |
| 177 | TZEEIOR 526 × TZEEIOR 30 | 5912.97 | 2091.35 | 64.63 | 0.50 | 1.00 | -100.00 | 0.89 | 0.61 | 31.46 | 4.82 | 5.53 | -14.73 | 4.50 | 5.00 | -11.11 |
| 178 | TZEEIOR 525 × TZEEIOR 30 | 5617.52 | 3217.10 | 42.73 | 0.25 | 0.79 | -216.00 | 0.95 | 0.80 | 15.79 | 5.02 | 4.66 | 7.17 | 5.00 | 4.25 | 15.00 |
| 179 | TZEEIOR 510 × TZEEIOR 30 | 6392.13 | 3805.47 | 40.47 | 0.25 | 1.29 | -416.00 | 0.97 | 0.91 | 6.19 | 5.02 | 4.16 | 17.13 | 5.00 | 3.25 | 35.00 |
| 180 | TZEEIOR 546 × TZEEIOR 30 | 7249.23 | 2095.20 | 71.10 | 1.75 | 0.27 | 84.57 | 0.90 | 0.78 | 13.33 | 3.77 | 4.92 | -30.50 | 4.00 | 5.00 | -25.00 |
| 181 | TZEEIOR 30 × TZEEIOR 97 | 5031.49 | 1621.49 | 67.77 | 0.75 | 2.05 | -173.33 | 0.92 | 0.69 | 25.00 | 4.96 | 5.80 | -16.94 | 5.25 | 5.75 | -9.52 |
| 182 | TZEEIOR 30 × TZEEIOR 197 | 5437.88 | 2093.71 | 61.50 | 0.25 | 2.16 | -764.00 | 0.88 | 0.70 | 20.45 | 4.01 | 5.30 | -32.17 | 4.25 | 5.50 | -29.41 |
| 183 | TZEEIOR 30 × TZEEIOR 249 | 5452.96 | 1791.15 | 67.15 | 0.50 | 3.03 | -506.00 | 0.93 | 0.76 | 18.28 | 5.02 | 5.01 | 0.20 | 4.25 | 5.25 | -23.53 |
| 184 | TZEEIOR 30 × TZEEIOR 9 A | 5200.02 | 1996.87 | 61.60 | 0.00 | 2.25 | -2.25 | 0.93 | 0.66 | 29.03 | 5.02 | 5.08 | -1.20 | 4.50 | 5.25 | -16.67 |
| 185 | TZEEIOR 97 × TZEEIOR 197 | 6065.87 | 2481.40 | 59.09 | 0.75 | 2.19 | -192.00 | 0.87 | 0.82 | 5.75 | 4.22 | 5.77 | -36.73 | 5.00 | 5.00 | 0.00 |
| 186 | TZEEIOR 97 × TZEEIOR 249 | 3280.30 | 2046.81 | 37.60 | 1.50 | 0.75 | 50.00 | 0.90 | 0.68 | 24.44 | 5.75 | 5.19 | 9.74 | 4.75 | 4.75 | 0.00 |
| 187 | TZEEIOR 97 × TZEEIOR 9 A | 5033.37 | 2109.45 | 58.09 | 0.50 | 1.39 | -178.00 | 0.85 | 0.75 | 11.76 | 4.78 | 5.48 | -14.64 | 4.25 | 5.25 | -23.53 |
| 188 | TZEEIOR 197 × TZEEIOR 9A | 5183.16 | 2026.00 | 60.91 | 0.50 | 1.53 | -206.00 | 0.94 | 0.77 | 18.09 | 4.55 | 5.31 | -16.70 | 5.25 | 5.00 | 4.76 |
| 189 | TZEEIOR 197 × TZEEIOR 249 | 5464.10 | 2299.81 | 57.91 | 1.00 | 0.73 | 27.00 | 0.93 | 0.74 | 20.43 | 4.57 | 4.60 | -0.66 | 4.75 | 4.75 | 0.00 |
| 190 | TZEEIOR 249 × TZEEIOR 9 A | 4348.00 | 2780.56 | 36.05 | 0.75 | 0.71 | 5.33 | 0.86 | 0.77 | 10.47 | 4.27 | 4.96 | -16.16 | 4.75 | 4.25 | 10.53 |
| 191 | CHECK 1 TZEEIOR 109 × TZdEEI 12 | 5271.48 | 2074.39 | 60.65 | 0.50 | 0.97 | -94.00 | 0.94 | 0.74 | 21.28 | 4.81 | 5.77 | -19.96 | 4.25 | 5.00 | -17.65 |
| 192 | CHECK 2 - TZEEI 79 × TZEEI 82 | 4720.41 | 3015.16 | 36.13 | 0.50 | 1.86 | -272.00 | 0.95 | 0.84 | 11.58 | 3.78 | 4.41 | -16.67 | 5.00 | 4.25 | 15.00 |
| 193 | CHECK 3 - TZEEIY Pop STR C5 × TZEEI 58 | 5415.24 | 1645.14 | 69.62 | 0.50 | 1.28 | -156.00 | 0.89 | 0.58 | 34.83 | 3.95 | 4.82 | -22.03 | 4.75 | 5.25 | -10.53 |
| 194 | CHECH 4 - TZdEEI 1 × TZdEEI 5 | 4270.19 | 1929.81 | 54.81 | 0.50 | 0.52 | -4.00 | 0.93 | 0.75 | 19.35 | 5.00 | 5.56 | -11.20 | 5.50 | 5.50 | 0.00 |
| 195 | CHECK 5 - TZEEIOR 12 × TZEEIOR 223 | 5731.83 | 1113.66 | 80.57 | 0.75 | 3.20 | -326.67 | 0.95 | 0.37 | 61.05 | 4.01 | 6.05 | -50.87 | 4.75 | 6.25 | -31.58 |
| 196 | CHECK 6 -TZdEEI 1 × TZdEEI 12 | 1566.51 | 1745.76 | -11.44 | 0.00 | 1.23 | -1.23 | 0.88 | 0.80 | 9.09 | 6.53 | 5.66 | 13.32 | 4.50 | 5.50 | -22.22 |
|  | average reduction |  |  | 61.10 |  |  | -181.87 |  |  | 22.47 |  |  | -24.97 |  |  | -10.64 |

WW: well-watered; MD: managed drought, RED: reduction; GY: grain yield, ASI: anthesis-silking interval; PASP: plant aspect; EASP: ear aspect; EPP: ear per plant.