**Supplementary data:**



Figure S1. Monthly patterns of rainfall and average temperature (ATem.) recorded during the course of the experiment (2012/15)

**Supplementary data:**

Table S1. Mean values and descriptive statistics of grain yield and agronomic traits of 16 durum wheat genotypes under two water supply and three cropping seasons

|  |  |  |  |
| --- | --- | --- | --- |
| **Genotype** |  **2012/13 (Severe drought)** | **2013/14 (Mild drought)** | **2014/15 (Moderate condition)** |
| **DF** | **PH** | **DM** | **AS** | **TKW** | **YLD** | **DF** | **PH** | **DM** | **AS** | **TKW** | **YLD** | **DF** | **PH** | **DM** | **AS** | **TKW** | **YLD** |
| ***Rainfed conditions*** |
| G1 | 151 | 67 | 187 | 2 | 34 | 1386 | 157 | 65 | 195 | 4.5 | 29.9 | 2889 | 166 | 45 | 204 | 3 | 26 | 1036 |
| G2 | 150 | 75 | 189 | 3 | 37 | 1374 | 161 | 67 | 196 | 3 | 26 | 3481 | 179 | 47 | 215 | 2 | 30 | 641 |
| G3 | 149 | 68 | 190 | 3 | 39 | 1610 | 163 | 69 | 196 | 3.5 | 34.6 | 3472 | 178 | 39 | 215 | 2 | 26 | 797 |
| G4 | 150 | 56 | 189 | 3.5 | 32 | 883 | 158 | 74 | 194 | 5 | 26.8 | 2930 | 166 | 50 | 205 | 2 | 29 | 744 |
| G5 | 150 | 56 | 191 | 3.5 | 37 | 622 | 159 | 77 | 194 | 5 | 33.5 | 3236 | 171 | 47 | 210 | 2 | 23 | 544 |
| G6 | 152 | 57 | 189 | 2 | 33 | 1217 | 160 | 78 | 195 | 4.5 | 28.2 | 3292 | 167 | 45 | 205 | 3 | 25 | 928 |
| G7 | 147 | 75 | 189 | 3 | 39 | 1214 | 160 | 72 | 195 | 4.5 | 35.3 | 2539 | 172 | 38 | 212 | 2 | 22 | 582 |
| G8 | 150 | 60 | 189 | 2 | 25 | 514 | 162 | 68 | 195 | 4 | 24.2 | 2622 | 176 | 50 | 212 | 3 | 20 | 715 |
| G9 | 152 | 55 | 189 | 2 | 33 | 368 | 158 | 73 | 194 | 4.5 | 28.1 | 2825 | 170 | 42 | 207 | 1 | 24 | 623 |
| G10 | 163 | 70 | 189 | 2 | 29 | 433 | 158 | 74 | 194 | 4 | 28.8 | 2747 | 170 | 36 | 207 | 2 | 19 | 723 |
| G11 | 152 | 52 | 189 | 2 | 25 | 409 | 158 | 70 | 194 | 4 | 31.1 | 2747 | 170 | 38 | 207 | 2 | 24 | 700 |
| G12 | 153 | 58 | 189 | 2 | 33 | 738 | 157 | 80 | 193 | 4.5 | 41 | 2864 | 170 | 42 | 207 | 2 | 23 | 585 |
| G13 | 152 | 55 | 189 | 2.5 | 35 | 912 | 155 | 82 | 193 | 4 | 32.5 | 3569 | 170 | 50 | 207 | 2 | 25 | 731 |
| G14 | 152 | 40 | 188 | 2 | 25 | 728 | 156 | 75 | 195 | 3.5 | 29.7 | 2636 | 170 | 42 | 207 | 2 | 26 | 608 |
| G15 | 152 | 60 | 189 | 2 | 31 | 857 | 157 | 83 | 195 | 4.5 | 32.9 | 3500 | 172 | 43 | 209 | 3 | 30 | 887 |
| G16 | 151 | 66 | 191 | 2 | 33 | 421 | 155 | 74 | 194 | 4.5 | 34.7 | 3667 | 166 | 51 | 204 | 2 | 21 | 479 |
| SE | 0.8 | 2.3 | 0.2 | 0.1 | 1.151 | 99.8 | 0.6 | 1.3 | 0.2 | 0.1 | 1.061 | 96.4 | 1 | 1.2 | 0.9 | 0.1 | 0.821 | 37.1 |
| Mean | 152 | 61 | 189 | 2.4 | 32.5 | 855 | 158 | 74 | 195 | 4.2 | 31.08 | 3064 | 171 | 44 | 208 | 2.2 | 24.56 | 708 |
| Min | 147 | 40 | 187 | 2 | 25 | 368 | 155 | 65 | 193 | 3 | 24.2 | 2539 | 166 | 36 | 204 | 1 | 19 | 479 |
| Max | 163 | 75 | 191 | 3.5 | 39 | 1610 | 163 | 83 | 196 | 5 | 41 | 3667 | 179 | 51 | 215 | 3 | 30 | 1036 |
| LSD (5%) |  |  |  |  |  | **259.5** |  |  |  |  |  | **613.5** |  |  |  |  |  | **330.5** |
| **Genotype** | ***Supplemental irrigation conditions*** |
| G1 | 151 | 65 | 193 | 4 | 37 | 3750 | 155 | 64 | 200 | 3.5 | 34.8 | 3689 | 163 | 61 | 203 | 4 | 28 | 1408 |
| G2 | 157 | 76 | 196 | 4 | 51 | 3705 | 163 | 77 | 202 | 3 | 41.1 | 3442 | 167 | 55 | 205 | 3 | 31 | 997 |
| G3 | 158 | 71 | 195 | 4 | 44 | 3650 | 164 | 63 | 202 | 3 | 37.4 | 3411 | 171 | 48 | 206 | 3 | 29 | 995 |
| G4 | 152 | 67 | 192 | 4.5 | 43 | 2888 | 160 | 80 | 201 | 4 | 41.8 | 3994 | 163 | 66 | 205 | 4 | 33 | 1197 |
| G5 | 152 | 55 | 191 | 4 | 39 | 2309 | 163 | 70 | 201 | 4 | 36.1 | 3445 | 164 | 52 | 205 | 4 | 26 | 1256 |
| G6 | 152 | 50 | 191 | 4 | 38 | 2928 | 164 | 80 | 202 | 4 | 39 | 3402 | 164 | 64 | 205 | 4 | 28 | 1364 |
| G7 | 154 | 64 | 192 | 5 | 37 | 2669 | 163 | 70 | 202 | 4.5 | 30.3 | 3643 | 165 | 67 | 205 | 4 | 26 | 1344 |
| G8 | 157 | 87 | 192 | 5 | 35 | 2776 | 163 | 74 | 202 | 4.5 | 35.4 | 3442 | 167 | 62 | 207 | 4 | 25 | 992 |
| G9 | 153 | 68 | 192 | 5 | 36 | 2591 | 163 | 64 | 202 | 4.5 | 35.4 | 3485 | 164 | 66 | 207 | 4 | 28 | 1403 |
| G10 | 155 | 66 | 192 | 4 | 36 | 2881 | 163 | 74 | 200 | 3.5 | 31.4 | 3146 | 164 | 53 | 207 | 4 | 26 | 1287 |
| G11 | 152 | 70 | 191 | 5 | 38 | 2809 | 161 | 75 | 200 | 4 | 40.7 | 3596 | 163 | 64 | 207 | 4 | 27 | 1333 |
| G12 | 152 | 81 | 191 | 5 | 38 | 3559 | 161 | 82 | 200 | 4 | 35.8 | 3368 | 163 | 58 | 205 | 3 | 31 | 1033 |
| G13 | 152 | 79 | 191 | 5 | 39 | 2981 | 161 | 85 | 200 | 4.5 | 33.3 | 3659 | 163 | 53 | 205 | 3 | 31 | 1159 |
| G14 | 153 | 70 | 195 | 4 | 35 | 2186 | 160 | 78 | 199 | 4 | 39.8 | 3451 | 163 | 62 | 205 | 3 | 27 | 1213 |
| G15 | 155 | 75 | 194 | 4 | 41 | 3171 | 163 | 81 | 201 | 4 | 37 | 4855 | 163 | 58 | 205 | 3 | 29 | 1097 |
| G16 | 152 | 85 | 191 | 4 | 39 | 2907 | 157 | 73 | 199 | 4 | 44.9 | 4072 | 162 | 59 | 205 | 3 | 25 | 1092 |
| SE | 0.5 | 2.5 | 0.4 | 0.1 | 1.02 | 118 | 0.6 | 1.7 | 0.3 | 0.1 | 0.979 | 99.9 | 0.6 | 1.4 | 0.3 | 0.1 | 0.598 | 37.6 |
| Mean | 154 | 71 | 192 | 4.4 | 39.13 | 2985 | 162 | 74 | 201 | 3.9 | 37.14 | 3631 | 164 | 59 | 205 | 3.6 | 28.13 | 1198 |
| Min | 151 | 50 | 191 | 4 | 35 | 2186 | 155 | 63 | 199 | 3 | 30.3 | 3146 | 162 | 48 | 203 | 3 | 25 | 992 |
| Max | 158 | 87 | 196 | 5 | 51 | 3750 | 164 | 85 | 202 | 4.5 | 44.9 | 4855 | 171 | 67 | 207 | 4 | 33 | 1408 |
| LSD (<5%) |  |  |  |  |  | **1004** |  |  |  |  |  | **1034** |  |  |  |  |  | **361.1** |
| **SI** |  |  |  |  |  | **0.71** |  |  |  |  |  | **0.16** |  |  |  |  |  | **0.41** |

DF: days to flowering; PH: plant height; DM: days to maturity; AS: agronomic score; TKW: 1000-kernel weight; YLD: grain yield; SE: standard error; Min: minimum; Max: Maximum; LSD: least significant difference; SI: stress intensity

Table S2. Drought stress indices for 16 durum wheat genotypes under mild, moderate and severe stress conditions

|  |  |  |  |
| --- | --- | --- | --- |
| **Genotype** | **Severe stress (2012/13)** | **Mild stress (2013/14)** | **Moderate stress (2014/15)** |
| **STI** | **GMP** | **MP** | **SSI** | **TOL** | **STI** | **GMP** | **MP** | **SSI** | **TOL** | **STI** | **GMP** | **MP** | **SSI** | **TOL** |
| G1 | 0.583 | 2280 | 2568 | 0.883 | 2364 | 0.808 | 3265 | 3289 | 1.389 | 800 | 1.016 | 1208 | 1222 | 0.646 | 372 |
| G2 | 0.571 | 2256 | 2540 | 0.882 | 2331 | 0.909 | 3461 | 3462 | -0.073 | -39 | 0.445 | 800 | 819 | 0.874 | 356 |
| G3 | 0.660 | 2424 | 2630 | 0.783 | 2040 | 0.898 | 3441 | 3442 | -0.115 | -61 | 0.553 | 891 | 896 | 0.485 | 197 |
| G4 | 0.286 | 1597 | 1886 | 0.973 | 2005 | 0.888 | 3421 | 3462 | 1.706 | 1064 | 0.620 | 944 | 971 | 0.927 | 454 |
| G5 | 0.161 | 1198 | 1465 | 1.024 | 1687 | 0.846 | 3339 | 3341 | 0.389 | 209 | 0.476 | 826 | 900 | 1.387 | 713 |
| G6 | 0.400 | 1888 | 2073 | 0.819 | 1711 | 0.849 | 3347 | 3347 | 0.207 | 110 | 0.882 | 1125 | 1146 | 0.781 | 436 |
| G7 | 0.364 | 1800 | 1942 | 0.764 | 1455 | 0.702 | 3041 | 3091 | 1.941 | 1104 | 0.545 | 884 | 963 | 1.386 | 762 |
| G8 | 0.160 | 1195 | 1645 | 1.142 | 2262 | 0.685 | 3004 | 3032 | 1.526 | 820 | 0.495 | 843 | 854 | 0.682 | 277 |
| G9 | 0.107 | 977 | 1480 | 1.202 | 2223 | 0.747 | 3138 | 3155 | 1.213 | 660 | 0.609 | 935 | 1013 | 1.359 | 779 |
| G10 | 0.140 | 1117 | 1657 | 1.191 | 2448 | 0.655 | 2940 | 2947 | 0.812 | 399 | 0.648 | 965 | 1005 | 1.071 | 564 |
| G11 | 0.129 | 1072 | 1609 | 1.197 | 2400 | 0.749 | 3143 | 3172 | 1.512 | 849 | 0.650 | 966 | 1017 | 1.161 | 633 |
| G12 | 0.295 | 1621 | 2149 | 1.111 | 2821 | 0.732 | 3106 | 3116 | 0.958 | 504 | 0.421 | 777 | 809 | 1.062 | 449 |
| G13 | 0.305 | 1649 | 1947 | 0.973 | 2069 | 0.991 | 3614 | 3614 | 0.158 | 90 | 0.590 | 920 | 945 | 0.903 | 428 |
| G14 | 0.179 | 1262 | 1457 | 0.935 | 1458 | 0.690 | 3016 | 3044 | 1.512 | 815 | 0.514 | 858 | 910 | 1.220 | 605 |
| G15 | 0.305 | 1648 | 2014 | 1.023 | 2314 | 1.289 | 4122 | 4178 | 1.787 | 1355 | 0.678 | 987 | 992 | 0.468 | 210 |
| G16 | 0.137 | 1107 | 1664 | 1.198 | 2486 | 1.133 | 3864 | 3870 | 0.637 | 405 | 0.365 | 724 | 786 | 1.372 | 613 |

Table S3. MSI and rank values for tested 16 durum wheat genotypes under different levels of drought stress

|  |  |  |  |
| --- | --- | --- | --- |
| **Genotype** | **Severe stress****(2012/13)** | **Mild stress****(2013/14)** | **Moderate stress****(2014/15)** |
| **MSI** | **Rank** | **MSI** | **Rank** | **MSI** | **Rank** |
| G1 | 3.2 | 2 | 7.4 | 9.5 | 1.8 | 1 |
| G2 | 3.4 | 3 | 4 | 3.5 | 7.4 | 10.5 |
| G3 | 1.8 | 1 | 4 | 3.5 | 4.8 | 4 |
| G4 | 6.4 | 7 | 7 | 8 | 5.6 | 5 |
| G5 | 7.6 | 11 | 5 | 7 | 8.6 | 15 |
| G6 | 3.6 | 4 | 4.8 | 6 | 3 | 2 |
| G7 | 3.8 | 5 | 9.4 | 16 | 8 | 13.5 |
| G8 | 8.6 | 12 | 9 | 15 | 6.2 | 8.5 |
| G9 | 9.2 | 13.5 | 7.8 | 12 | 7.4 | 10.5 |
| G10 | 9.4 | 15.5 | 7.6 | 11 | 6 | 7 |
| G11 | 9.2 | 13.5 | 8.4 | 13 | 6.2 | 8.5 |
| G12 | 7.4 | 10 | 7.4 | 9.5 | 7.8 | 12 |
| G13 | 6 | 6 | 3.2 | 2 | 5.8 | 6 |
| G14 | 6.8 | 9 | 8.8 | 14 | 8 | 13.5 |
| G15 | 6.6 | 8 | 4.6 | 5 | 3.8 | 3 |
| G16 | 9.4 | 15.5 | 3 | 1 | 9.6 | 16 |