**Table S1.** Names and codes of 56 wheat genotypes used in the study.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NO. | Genotypes code | Name of genotype | Year of release | TGW (g) | NO. | Genotypes code | Name of genotype | Year of release | TGW (g) |
| 1 | B1 | Niknejad | 1995 | 41.1 | 29 | B29 | Golestan | 1986 | 42.0 |
| 2 | B2 | Alvand | 1995 | 45.7 | 30 | B30 | Roz | - | 34.5 |
| 3 | B3 | Shiroudi | 1997 | 46.5 | 31 | B31 | Shahryar | 2002 | 35.0 |
| 4 | B4 | Baz | - | 35.0 | 32 | B32 | Heirmand | 1991 | 46.0 |
| 5 | B5 | Hamoon | 2002 | 47.0 | 33 | B33 | Karaj-2 | 1973 | 42.5 |
| 6 | B6 | Alamout | 1995 | 40.5 | 34 | B34 | Rassoul | 1992 | 44.0 |
| 7 | B7 | Sardari | 1930 | 47.5 | 35 | B35 | Arta | 2001 | 36.5 |
| 8 | B8 | Zaree | 2010 | 42.0 | 36 | B36 | Mughan-1 | 1973 | 38.5 |
| 9 | B9 | Shiraz | 2002 | 39.5 | 37 | B37 | Mughan-2 | 1974 | 37.0 |
| 10 | B10 | Neishabour | 2006 | 49.0 | 38 | B38 | Mughan-3 | 2006 | 37.5 |
| 11 | B11 | Kavir | 1997 | 40.5 | 39 | B39 | Ghohar | - | 43.5 |
| 12 | B12 | Alborz | 1978 | 48.5 | 40 | B40 | Pastor | 2000 | 39.5 |
| 13 | B13 | Bahar | 2007 | 43.5 | 41 | D41 | Seimareh † | 1996 | 55.0 |
| 14 | B14 | Atrak | 1995 | 48.0 | 42 | B42 | Behrang | 2009 | 53.5 |
| 15 | B15 | Bezostaya | 1969 | 45.5 | 43 | B43 | Azar-2 | 1997 | 49.0 |
| 16 | B16 | Navid | 1990 | 40.0 | 44 | B44 | Cross of Alborz | 2010 | 44.5 |
| 17 | B17 | Falat | 1990 | 39.0 | 45 | D45 | Saji † | 2009 | 49.5 |
| 18 | B18 | Pishgam | 2008 | 46.0 | 46 | B46 | Ohadi | 2009 | 47.5 |
| 19 | B19 | Ghods | 1989 | 31.5 | 47 | B47 | Rasad | 2007 | 47.5 |
| 20 | B20 | Mahdavi | 1995 | 38.0 | 48 | D48 | Zardak † | - | 54.0 |
| 21 | B21 | Argh | 2009 | 40.0 | 49 | B49 | Kouhdasht | 2000 | 46.0 |
| 22 | B22 | Darab-2 | 1995 | 39.5 | 50 | B50 | UN-11 \* | - | 48.0 |
| 23 | B23 | Sivand | 2009 | 41.5 | 51 | B51 | Chamran | 1997 | 42.5 |
| 24 | B24 | Tous | 2002 | 39.5 | 52 | B52 | Parsi | 2009 | 52.0 |
| 25 | B25 | Oroom | 2010 | 45.5 | 53 | B53 | 318 \* | - | 41.5 |
| 26 | B26 | Pishtaz | 2002 | 49.0 | 54 | B54 | 330 \* | - | 39.0 |
| 27 | B27 | Zarin | 1995 | 42.5 | 55 | B55 | 341 \* | - | 43.0 |
| 28 | B28 | Tajan | 1995 | 37.5 | 56 | B56 | Marvdasht | 1999 | 38.0 |

† Durum wheat.

\* Superior elite line.

1000-grains weight (TGW), Bread wheat (B), and Durum wheat (D).

Source: Karaj Agricultural and Natural Resources Research and Education Center, Karaj, Iran.

**Table S2.** Equations drought stress tolerance indices.

|  |  |  |
| --- | --- | --- |
| Index | Equation | Reference |
| Stress tolerance index (STI) |  | Fernandez [8] |
| Relative drought index (RDI) |  | Fischer and Wood [14] |
| Yield index (YI) |  | Lin et al. [15], Gavuzzi et al. [16] |
| Yield stability index (YSI) |  | Bouslama and Schapaugh [9] |
| Drought resistance index (DI) |  | Lan [17] |
| Abiotic tolerance index (ATI) |  | Moosavi et al. [18] |
| Stress susceptibility percentage index (SSPI) |  | Moosavi et al. [18] |
| Sensitive drought index (SDI) | *SDI = (Yp – Ys)/Yp* | Farshadfar and Sutka [10], Farshadfar et al. [19] |
| Modified stress tolerance index in normal irrigation (K1STI) | *K1STI = (Yp2/ Ȳp2) × STI* | Farshadfar and Sutka [10] |
| Modified stress tolerance index in stress irrigation (K2STI) | *K2STI = (Ys2/ Ȳs2) × STI* | Farshadfar and Sutka [10] |

Yp and Ys: Grain yield of each genotype under normal and drought stress conditions, respectively.

Ȳp and Ȳs: Mean grain yield of all genotypes under normal and drought stress conditions, respectively.

**Table S3.** New indices of drought stress tolerance for 56 wheat genotypes.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NO. | Genotypes code | RDI | YI | YSI | DI | ATI | SSPI | SDI | K1STI | K2STI |
| 1 | B1 | 0.864 | 1.004 | 0.629 | 0.632 | 0.086 | 21.5 | 0.371 | 4.70 | 3.51 |
| 2 | B2 | 0.838 | 0.947 | 0.610 | 0.578 | 0.084 | 22.0 | 0.390 | 4.27 | 3.00 |
| 3 | B3 | 0.534 | 0.473 | 0.389 | 0.184 | 0.064 | **27.1** | **0.611** | 1.78 | 0.51 |
| 4 | B4 | 1.016 | 0.874 | 0.740 | 0.647 | 0.036 | 11.2 | 0.260 | 2.04 | 2.10 |
| 5 | B5 | 1.113 | 1.074 | 0.810 | 0.870 | 0.034 | 9.2 | 0.190 | 2.99 | 3.70 |
| 6 | B6 | **1.234** | 1.177 | **0.898** | 1.057 | 0.019 | 4.9 | 0.102 | 3.03 | 4.61 |
| 7 | B7 | 1.068 | 1.100 | 0.777 | 0.855 | 0.045 | 11.5 | 0.223 | 3.58 | 4.08 |
| 8 | B8 | 0.793 | 0.911 | 0.577 | 0.526 | 0.091 | 24.3 | 0.423 | 4.40 | 2.77 |
| 9 | B9 | 0.783 | 0.767 | 0.570 | 0.437 | 0.067 | 21.1 | 0.430 | 2.71 | 1.66 |
| 10 | B10 | 0.965 | 1.066 | 0.702 | 0.749 | 0.066 | 16.4 | 0.298 | 4.23 | 3.93 |
| 11 | B11 | 0.999 | 0.938 | 0.727 | 0.682 | 0.044 | 12.8 | 0.273 | 2.63 | 2.62 |
| 12 | B12 | 0.836 | 0.914 | 0.608 | 0.556 | 0.079 | 21.4 | 0.392 | 3.88 | 2.71 |
| 13 | B13 | 1.201 | **1.225** | 0.874 | **1.071** | 0.026 | 6.4 | 0.126 | 3.66 | **5.28** |
| 14 | B14 | 0.960 | 1.103 | 0.699 | 0.770 | 0.072 | 17.3 | 0.301 | 4.74 | 4.36 |
| 15 | B15 | 0.811 | 0.967 | 0.590 | 0.571 | **0.096** | **24.4** | 0.410 | 4.96 | 3.26 |
| 16 | B16 | 0.935 | 1.186 | 0.680 | 0.807 | 0.091 | 20.3 | 0.320 | **6.31** | **5.51** |
| 17 | B17 | 1.139 | 1.106 | 0.829 | 0.917 | 0.032 | 8.3 | 0.171 | 3.08 | 4.00 |
| 18 | B18 | 0.841 | 0.809 | 0.612 | 0.496 | 0.060 | 18.6 | 0.388 | 2.64 | 1.87 |
| 19 | B19 | 1.074 | 1.065 | 0.782 | 0.832 | 0.041 | 10.8 | 0.218 | 3.20 | 3.69 |
| 20 | B20 | **1.271** | 1.062 | **0.925** | 0.983 | 0.011 | 3.1 | 0.075 | 2.06 | 3.34 |
| 21 | B21 | 0.782 | 0.918 | 0.569 | 0.522 | **0.096** | **25.3** | **0.431** | 4.67 | 2.85 |
| 22 | B22 | 0.708 | 0.990 | 0.516 | 0.511 | **0.146** | **33.8** | **0.484** | **7.61** | 3.82 |
| 23 | B23 | 1.197 | 1.141 | 0.871 | 0.994 | 0.024 | 6.1 | 0.129 | 2.98 | 4.27 |
| 24 | B24 | 0.986 | 0.985 | 0.718 | 0.707 | 0.051 | 14.1 | 0.282 | 3.15 | 3.06 |
| 25 | B25 | 1.142 | 1.007 | 0.831 | 0.837 | 0.026 | 7.5 | 0.169 | 2.31 | 3.01 |
| 26 | B26 | 0.901 | 1.019 | 0.656 | 0.668 | 0.077 | 19.4 | 0.344 | 4.40 | 3.57 |
| 27 | B27 | 1.159 | 1.008 | 0.844 | 0.851 | 0.023 | 6.8 | 0.156 | 2.23 | 2.99 |
| 28 | B28 | 1.128 | 1.167 | 0.821 | 0.958 | 0.037 | 9.2 | 0.179 | 3.70 | 4.71 |
| 29 | B29 | 1.044 | **1.241** | 0.760 | 0.943 | 0.064 | 14.3 | 0.240 | **5.43** | **5.92** |
| 30 | B30 | 0.922 | 0.876 | 0.671 | 0.588 | 0.052 | 15.6 | 0.329 | 2.64 | 2.24 |
| 31 | B31 | 1.054 | 0.914 | 0.767 | 0.701 | 0.033 | 10.1 | 0.233 | 2.12 | 2.35 |
| 32 | B32 | 1.115 | 1.124 | 0.812 | 0.912 | 0.037 | 9.5 | 0.188 | 3.41 | 4.24 |
| 33 | B33 | 0.816 | 0.739 | 0.594 | 0.439 | 0.055 | 18.4 | 0.406 | 2.17 | 1.45 |
| 34 | B34 | 0.669 | 0.604 | 0.487 | 0.294 | 0.063 | **23.1** | 0.513 | 2.01 | 0.90 |
| 35 | B35 | 1.156 | 1.045 | 0.842 | 0.879 | 0.026 | 7.2 | 0.158 | 2.50 | 3.34 |
| 36 | B36 | 0.945 | **1.287** | 0.688 | 0.885 | **0.103** | 21.2 | 0.312 | **7.83** | **6.99** |
| 37 | B37 | 1.193 | 1.073 | 0.868 | 0.932 | 0.021 | 5.9 | 0.132 | 2.50 | 3.56 |
| 38 | B38 | 1.009 | 0.958 | 0.735 | 0.704 | 0.044 | 12.6 | 0.265 | 2.73 | 2.78 |
| 39 | B39 | **1.310** | **1.215** | **0.953** | **1.159** | 0.008 | 2.2 | 0.047 | 2.87 | 4.92 |
| 40 | B40 | 1.038 | 1.033 | 0.756 | 0.781 | 0.045 | 12.1 | 0.244 | 3.18 | 3.43 |
| 41 | D41 | 0.883 | 1.006 | 0.643 | 0.647 | 0.080 | 20.4 | 0.357 | 4.47 | 3.48 |
| 42 | B42 | 1.212 | 1.205 | 0.882 | **1.062** | 0.024 | 5.9 | 0.118 | 3.40 | 4.99 |
| 43 | B43 | 1.044 | 0.930 | 0.760 | 0.707 | 0.036 | 10.7 | 0.240 | 2.29 | 2.49 |
| 44 | B44 | 1.227 | 0.965 | 0.893 | 0.862 | 0.013 | 4.2 | 0.107 | 1.69 | 2.55 |
| 45 | D45 | 0.922 | 0.939 | 0.671 | 0.631 | 0.060 | 16.7 | 0.329 | 3.25 | 2.76 |
| 46 | B46 | 0.827 | 0.652 | 0.602 | 0.392 | 0.041 | 15.7 | 0.398 | 1.44 | 0.99 |
| 47 | B47 | 1.149 | 0.885 | 0.836 | 0.740 | 0.019 | 6.3 | 0.164 | 1.54 | 2.04 |
| 48 | D48 | 1.159 | 0.921 | 0.844 | 0.777 | 0.020 | 6.2 | 0.156 | 1.70 | 2.28 |
| 49 | B49 | 1.081 | 0.835 | 0.787 | 0.657 | 0.024 | 8.2 | 0.213 | 1.52 | 1.77 |
| 50 | B50 | 0.903 | 1.099 | 0.657 | 0.722 | 0.089 | 20.8 | 0.343 | **5.49** | 4.48 |
| 51 | B51 | 1.206 | 1.209 | 0.878 | **1.061** | 0.025 | 6.1 | 0.122 | 3.48 | 5.06 |
| 52 | B52 | 0.824 | 0.704 | 0.600 | 0.422 | 0.049 | 17.1 | 0.400 | 1.84 | 1.25 |
| 53 | B53 | **1.317** | 1.066 | **0.959** | 1.022 | 0.006 | 1.7 | 0.041 | 1.91 | 3.31 |
| 54 | B54 | **1.278** | **1.368** | **0.930** | **1.273** | 0.017 | 3.7 | 0.070 | 4.36 | **7.11** |
| 55 | B55 | 1.215 | 1.159 | 0.885 | 1.026 | 0.021 | 5.5 | 0.115 | 3.01 | 4.44 |
| 56 | B56 | 0.768 | 0.880 | 0.559 | 0.492 | **0.093** | **25.3** | **0.441** | 4.31 | 2.54 |

Relative drought index (RDI), Yield index (YI), Yield stability index (YSI), Drought resistance index (DI), Abiotic tolerance index (ATI), Stress susceptibility percentage index (SSPI), Sensitive drought index (SDI), Modified stress tolerance index in normal irrigation (K1STI), and Modified stress tolerance index in stress irrigation (K2STI). Numbers inside the table are genotypes code (see Table S1).

Bread wheat (B) and Durum wheat (D).

Bolds indicate selected genotypes for each trait.

**Table S4.** Rank of STI and new indices of drought stress tolerance for 56 wheat genotypes.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NO. | Genotypes code | STI | RDI | YI | YSI | DI | ATI | SSPI | SDI | K1STI | K2STI |
| 1 | B1 | 13 | 42 | 30 | 42 | 40 | 9 | 9 | 15 | 8 | 24 |
| 2 | B2 | 25 | 44 | 36 | 44 | 43 | 10 | 8 | 13 | 15 | 33 |
| 3 | B3 | 56 | 56 | 56 | 56 | 56 | 17 | 2 | 1 | 51 | 56 |
| 4 | B4 | 47 | 29 | 48 | 29 | 38 | 35 | 31 | 28 | 47 | 47 |
| 5 | B5 | 28 | 21 | 18 | 21 | 18 | 36 | 37 | 36 | 31 | 20 |
| 6 | B6 | 20 | 5 | 9 | 5 | 6 | 51 | 51 | 52 | 29 | 10 |
| 7 | B7 | 17 | 24 | 16 | 24 | 20 | 27 | 30 | 33 | 20 | 16 |
| 8 | B8 | 27 | 50 | 44 | 50 | 46 | 7 | 6 | 7 | 11 | 37 |
| 9 | B9 | 48 | 51 | 51 | 51 | 52 | 15 | 12 | 6 | 35 | 51 |
| 10 | B10 | 12 | 33 | 20 | 33 | 28 | 16 | 22 | 24 | 16 | 18 |
| 11 | B11 | 39 | 31 | 38 | 31 | 35 | 28 | 27 | 26 | 38 | 40 |
| 12 | B12 | 31 | 45 | 42 | 45 | 45 | 12 | 10 | 12 | 17 | 39 |
| 13 | B13 | 8 | 10 | 4 | 10 | 3 | 39 | 43 | 47 | 19 | 5 |
| 14 | B14 | 7 | 34 | 15 | 34 | 27 | 14 | 19 | 23 | 7 | 13 |
| 15 | B15 | 14 | 49 | 33 | 49 | 44 | 4 | 5 | 8 | 6 | 30 |
| 16 | B16 | 2 | 36 | 8 | 36 | 24 | 6 | 15 | 21 | 3 | 4 |
| 17 | B17 | 24 | 18 | 14 | 18 | 14 | 38 | 38 | 39 | 28 | 17 |
| 18 | B18 | 45 | 43 | 50 | 43 | 49 | 20 | 17 | 14 | 36 | 49 |
| 19 | B19 | 26 | 23 | 22 | 23 | 23 | 31 | 32 | 34 | 25 | 21 |
| 20 | B20 | 38 | 4 | 23 | 4 | 10 | 54 | 54 | 53 | 46 | 28 |
| 21 | B21 | 23 | 52 | 41 | 52 | 47 | 3 | 4 | 5 | 9 | 35 |
| 22 | B22 | 5 | 54 | 31 | 54 | 48 | 1 | 1 | 3 | 2 | 19 |
| 23 | B23 | 22 | 11 | 12 | 11 | 9 | 45 | 46 | 46 | 32 | 14 |
| 24 | B24 | 32 | 32 | 32 | 32 | 32 | 24 | 26 | 25 | 27 | 31 |
| 25 | B25 | 37 | 17 | 28 | 17 | 22 | 40 | 40 | 40 | 41 | 32 |
| 26 | B26 | 15 | 40 | 26 | 40 | 36 | 13 | 16 | 17 | 12 | 22 |
| 27 | B27 | 40 | 13 | 27 | 13 | 21 | 46 | 42 | 44 | 43 | 34 |
| 28 | B28 | 10 | 19 | 10 | 19 | 11 | 32 | 36 | 38 | 18 | 9 |
| 29 | B29 | 3 | 27 | 3 | 27 | 12 | 18 | 25 | 30 | 5 | 3 |
| 30 | B30 | 42 | 38 | 47 | 38 | 42 | 23 | 24 | 19 | 37 | 46 |
| 31 | B31 | 44 | 25 | 43 | 25 | 34 | 37 | 34 | 32 | 45 | 44 |
| 32 | B32 | 18 | 20 | 13 | 20 | 15 | 33 | 35 | 37 | 22 | 15 |
| 33 | B33 | 51 | 48 | 52 | 48 | 51 | 22 | 18 | 9 | 44 | 52 |
| 34 | B34 | 54 | 55 | 55 | 55 | 55 | 19 | 7 | 2 | 48 | 55 |
| 35 | B35 | 35 | 15 | 24 | 15 | 17 | 41 | 41 | 42 | 39 | 27 |
| 36 | B36 | 1 | 35 | 2 | 35 | 16 | 2 | 11 | 22 | 1 | 2 |
| 37 | B37 | 33 | 12 | 19 | 12 | 13 | 47 | 48 | 45 | 40 | 23 |
| 38 | B38 | 36 | 30 | 35 | 30 | 33 | 29 | 28 | 27 | 34 | 36 |
| 39 | B39 | 19 | 2 | 5 | 2 | 2 | 55 | 55 | 55 | 33 | 8 |
| 40 | B40 | 29 | 28 | 25 | 28 | 25 | 26 | 29 | 29 | 26 | 26 |
| 41 | D41 | 16 | 41 | 29 | 41 | 39 | 11 | 14 | 16 | 10 | 25 |
| 42 | B42 | 11 | 8 | 7 | 8 | 4 | 44 | 49 | 49 | 23 | 7 |
| 43 | B43 | 43 | 26 | 39 | 26 | 31 | 34 | 33 | 31 | 42 | 43 |
| 44 | B44 | 46 | 6 | 34 | 6 | 19 | 53 | 52 | 51 | 53 | 41 |
| 45 | D45 | 34 | 37 | 37 | 37 | 41 | 21 | 21 | 20 | 24 | 38 |
| 46 | B46 | 55 | 46 | 54 | 46 | 54 | 30 | 23 | 11 | 56 | 54 |
| 47 | B47 | 50 | 16 | 45 | 16 | 29 | 50 | 44 | 41 | 54 | 48 |
| 48 | D48 | 49 | 14 | 40 | 14 | 26 | 49 | 45 | 43 | 52 | 45 |
| 49 | B49 | 52 | 22 | 49 | 22 | 37 | 43 | 39 | 35 | 55 | 50 |
| 50 | B50 | 6 | 39 | 17 | 39 | 30 | 8 | 13 | 18 | 4 | 11 |
| 51 | B51 | 9 | 9 | 6 | 9 | 5 | 42 | 47 | 48 | 21 | 6 |
| 52 | B52 | 53 | 47 | 53 | 47 | 53 | 25 | 20 | 10 | 50 | 53 |
| 53 | B53 | 41 | 1 | 21 | 1 | 8 | 56 | 56 | 56 | 49 | 29 |
| 54 | B54 | 4 | 3 | 1 | 3 | 1 | 52 | 53 | 54 | 13 | 1 |
| 55 | B55 | 21 | 7 | 11 | 7 | 7 | 48 | 50 | 50 | 30 | 12 |
| 56 | B56 | 30 | 53 | 46 | 53 | 50 | 5 | 3 | 4 | 14 | 42 |

Stress tolerance index (STI), Relative drought index (RDI), Yield index (YI), Yield stability index (YSI), Drought resistance index (DI), Abiotic tolerance index (ATI), Stress susceptibility percentage index (SSPI), Sensitive drought index (SDI), Modified stress tolerance index in normal irrigation (K1STI), and Modified stress tolerance index in stress irrigation (K2STI).

Numbers inside the table are genotypes code (see Table S1).

Bread wheat (B) and Durum wheat (D).