

Supplementary Materials

Table S1. Correlation of the seed germination traits with the first two discriminant axes of PCA.

| Traits | PC1 | PC2 |
|--------|-------|--------|
| RL | 0.601 | -0.260 |
| CL | 0.544 | 0.825 |
| GR | 0.585 | -0.502 |

GR: germination rate; CL: coleoptile length; RL: radicle length.

Table S2. Correlation of the physiological and agro-morphological traits obtained under pot conditions with the first two discriminant axes of PCA.

| Traits | PC1 | PC2 |
|------------------------|------------|------------|
| Seed N S ⁻¹ | 0.363 | 0.561 |
| LA | 0.368 | -0.656 |
| B plant ⁻¹ | 0.383 | -0.162 |
| GY plant ⁻¹ | 0.389 | -0.204 |
| TKW | 0.387 | 0.232 |
| Chl | 0.373 | -0.113 |
| RWC | 0.381 | 0.347 |

RWC: relative water content; Chl: chlorophyll content; LA: leaf area; B plant⁻¹: biomass per plant; Seed N S⁻¹: seed number per spike, TKW: thousand kernel weight; GY plant⁻¹: grain yield per plant.

Table S3. Correlation of the agro-morphological traits obtained under field conditions with the first two discriminant axes of PCA.

| Traits | PC1 | PC2 |
|------------------------|------------|------------|
| GY plant ⁻¹ | 0.504 | -0.355 |
| B plant ⁻¹ | 0.524 | -0.408 |
| TKW | 0.527 | 0.045 |
| PH | 0.440 | 0.839 |

PH: plant height; B plant⁻¹: biomass per plant; TKW: thousand weight kernel; GY plant⁻¹: grain yield per plant.

Table S4. Correlation of the physiological and agro-morphological traits obtained under field conditions with the first two discriminant axes of PCA.

| Traits | PC1 | PC2 |
|-----------------------|------------|------------|
| Seed WS ⁻¹ | 0.447 | -0.070 |
| GY plot ⁻¹ | 0.403 | -0.197 |
| TKW | 0.434 | 0.236 |
| Chl | 0.433 | 0.193 |
| B plot ⁻¹ | 0.393 | 0.474 |
| SN plot ⁻¹ | 0.327 | -0.800 |

Chl: chlorophyll content; B plot⁻¹: biomass per plot; SN plot⁻¹: spike number per plot; Seed WS⁻¹: seed weight per spike; TKW: thousand kernel weight; GY plot⁻¹: grain yield per plot.

Table S5. Main characteristic of used durum wheat cultivars.

| Name | Origin | | | Main characteristics |
|-------|------------------|----------|-----|---|
| Karim | Cross | made | at | Semi-early cultivar |
| | CIMMYT/Mexico | | and | Productive cultivar |
| | released in 1980 | | | Susceptible to leaf rust and septoria diseases |
| | | | | Specific weight: 78-82 kg hl ⁻¹ |
| | | | | Thousand kernel weight: 40-45 g |
| | | | | Proteins: 11-15% |
| Maali | Local | crossing | and | Early cultivar |
| | released in 2007 | | | Very productive (25% more than Karim) |
| | | | | Resistant to powdery mildew, and moderately resistant to septoria and leaf rust |
| | | | | Tolerant to drought |
| | | | | Specific weight: 82-84 kg hl ⁻¹ |
| | | | | Thousand kernel weight: 40-45 g |
| | | | | Proteins: 12-15% |
| Salim | Local | crossing | and | Early cultivar |
| | released in 2009 | | | Very productive cultivar |
| | | | | Resistant to septoria, leaf rust, and to yellow rust |
| | | | | Tolerant to drought |
| | | | | Specific weight: 80-83 kg hl ⁻¹ |
| | | | | Thousand kernel weight: 40-48 g |
| | | | | Proteins: 12-13.5% |

Table S6. Mean precipitation (mm) and temperature (°C) in Boulifa/Kef site during 2016/17 cropping season.

| Meteorological data | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul |
|----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Precipitation (mm) | 11 | 43 | 51 | 32 | 24 | 2 | 40 | 2 | 37 | 15 |
| Temperature (°C) | 20.75 | 14.3 | 10.05 | 6.65 | 12.5 | 12.3 | 16.95 | 21.15 | 26.5 | 28.35 |