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Morphological and Anatomical Study on some Wheat Cultivars and Their Response to Seasonal Variations

Sawsan M. Abou-Taleb and **Elham F. Gomaa**
Department of Agricultural Botany, Faculty of Agriculture, Cairo University, Egypt

Abstract: An experiment was conducted at The Agricultural Experimental and Research Station, Faculty of Agriculture, Cairo University, Egypt during the two successive seasons of 2007/2008 and 2008/2009. Two wheat species were adopted to evaluate some morphological and anatomical features as well as some yield and yield attributes. Seasonal influences on performance of cultivated genotypes have been considered. Six cultivars, three of bread wheat (*Triticum aestivum*) viz., Sids1, Gemmieza7and Sakha93&others of macaroni wheat (*Triticum durum*) viz., Beni Sweif1, Beni Sweif3 and Sohag3, were utilized. Regarding the bread wheat, plants of Sids1cv. were the tallest ones in both seasons. Plants of Sakha93 cv. was the superior with respect to number of leaves/plant in the first season and Gemmeiza7 in the second one. Wider leaf area/plant was for Sids1. The highest dry weight of shoot was produced by Gemmeiza7 plants in both seasons with significant differences compared to the other two cultivars. Regarding the durum wheat, insignificant differences were detected between the three studied cultivars with respect to plant height in both seasons and number of developed tillers/plant in the first season. Plants of Beni Sweif1 produced the highest shoot dry weight in the first season with significant difference. In the second season, maximum shoot dry weight/plant was recorded by Sohag3 plants with significant differences. Regarding seasonal effect, pronounced increase was achieved in shoot dry weight and weight of 1000 kernels in majority of the studied cultivars in the second season compared to the first one. Main spike length and number of spikelets /main spike were reduced as higher temperature was prevailed in the second season. As to the seasonal effect on performance of the two species, insignificant differences were detected between seasons except for seed index of the species *T. aestivum*. The trait was significantly increased by 27.4% in the second season over that in the first one. Considerable but insignificant increment was recorded in shoot dry weight of both species in the second season. The percentages of increment were 63.8% and 103.3% for *T. aestivum* and *T. durum* respectively. Means of number of grains/plant were reduced in the second season by 8.3% and 10% for *T. aestivum* and *T. durum* respectively. Weight of grain yield/plant was increased in the second season by (27.5%) and (3.4%) for *T. aestivum* and *T. durum* respectively. Comparing between the studied species, higher numbers of

spikelet/spike were produced by *T. aestivum* cvs. compared to *T. durum* ones in both seasons, the latter possessed shorter spikes. Insignificant differences were detected between the two species except for number of grains/plant in both seasons and weight of grain yield/plant in the first season, *T. durum* was the superior. Seed index was increased by 21% in *T. durum* over that of *T. aestivum* in the first season while it reduced by 9.6% in the second one. No great differences were recognized comparing the anatomical features of main stems as well as flag leaves of the studied cultivars. Stem transection of Sids1 cv. exhibited narrower chlorenchyma adjacent to the peripheral bundles .Stem outlines of Beni Sweif 1 and Sohg 3 were slightly ridged as the peripheral bundles located. Stem bundles of Sohg3 cv. seemed to arrange in three concentric rings, the inner ring contains the larger vascular bundles. Peripheral larger bundles, occasionally found in stems of Gemmeiza7 and Sakha93, are separated from the epidermis by layers of sclerenchyma. In Gemmeiza7 stem, chlorenchyma adjacent to the outer peripheral bundles occasionally extended tangentially seemed in connection between the nearby bundles. Flag leaf of Sakha93 cv. obviously differed. It possessed thicker midrib, contains the largest vascular bundle, than the two sided lamina. The laminar bundles appeared in zigzag manner. Flag leaves of the other cultivars possessed midribs slightly thicker than the lamina.

Key words: Wheat, *T. aestivum, T. durum*, cultivars, morphology, anatomy, yield component and seasonal influences.