EVALUATION OF SOME WHEAT (*Triticum aestivum* L.) SEGREGATING GENERATIONS

BY

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B.Sc. Agric. (Agronomy), Fac. Agric.,

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ABSTRACT

The study was conducted at Demo exp. farm, Fac. Agric., Fayoum Univ., during ١٢/٢٠١٣ and ١٣/٢٠١٤, on ٣٦ genotypes of hybrid origin together with ٤ parental cultvaries to evaluate growth and reproductive traits. Exp.design was RCBD with three replications, where grains were sown, on ٢٣th and ١٩th November, in the two seasons, in rows of ٣.٥m long and ٢٥ cm apart and ٥cm between plants. The culture practices recommended for growing wheat were followed. During each season, two vegetative samples (٥ plants for each) were randomly taken from inner center rows plot^{-1} at ١٠٥ and ١٣٠ days ages to measure the growth traits. At harvest, yield and its attributes were evaluated. The results revealed significant differences among genotypes for both growth (in the two samples) and yielding traits in the two seasons.Growth trait performance at young age showed that G.١٧, G.٣ in ١st season and G.٤, G.٣٣ and G٣٤ in ٢nd season were superior for some traits (for each). In the ٢nd sample, G.٣٥, G.٣٤, G.١٧ and G.١٢ in both seasons and G.٢١ in ١st season were of advantage of some growth traits. The performance of yielding traits showed that G.٣, G.١٧, G.٢٤, G.٣٠, G.٣٢ and G.٣٥ in both seasons and G.١٦ in ١stone were elite for some traits for each. Compared to other genotypes and checking CVS. Variability results represented by Vp, Vg, Ve, PCV and GCV indicated great range of variability among genotypes in regard to growth and yielding traits. Mostly,Vpof growth traits at the two ages were higher than the corresponding Vg.PCV ranged from ١٠.١٣ and ١٠.٤٢ for plant height to ٤٤.٤٧ and ٥٩.٦٠ for extrusion length at young age in the two season, respectively. In the ٢nd sample, PCV ranged from ٧.٥٥ and ٧.٦٢ for spike length and ٢٥.١٨ for total leaf area plant^{-1}in ١st season and ٢٥.٥٧ for extrusion length in ٢nd one. The corresponding GCV ranged from ٩.٩٥ and ١٠.٣٣ for plant height to ٤٤.٢٩ and ٩٥.٣٠ for extrusion length at young age in both seasons. At late age, GCV ranged from ٧.٤١ and ٧.٣٩ for spike length to ٢٤.٨٥ for total leaf area plant^{-1}in ١st season and ٢٨.٤٢ for extrusion length in ٢nd season. Regarding yielding trait, PCV ranged from ٤.١٩ and ٤.٣١ for days to physiological maturity in both seasons to ٢٣.٤٥ for grain yield/fed in ١st season and ٣٤.٥٤ for straw yield in ٢nd season. GCV ranged from ٤.١١ and ٤.٢٥ for days to physiological maturity in both seasons to ٢١.٨١ for grain yield/fed in ١st season and ٣٢.٣٨ for straw yield in ٢nd season. Growth and yielding trait exhibited high broad sense heritability as well as acceptable genetic advance percent from means, in both seasons.

Grain yield plant^{-1} exhibited highly significant genotypic (rg) and phenotypic (rp) correlations with number of tillers plant^{-1}, number

of leaves plant^{-1}, total leaf area plant^{-1}and dry weight plant^{-1} in the ١st sample and grain yield/fed in both samples and with spike length in ٢nd sample. It was positively associated at significant level withplant height in ١st sample. Grain yield/fed showed positive and highly significant rg and rp with grain yield plant^{-1} in both samples and with number of tillers plant^{-1}, number of leaves plant^{-1}, flag leaf area and dry weight plant^{-1} in ١st sample and spike length in ٢nd sample. It had positive and highly significant rg with dry weight plant^{-1} and significant with number of tillers plant^{-1} in ٢nd sample. Also, grain yield plant^{-1} showed positive and highly significant association with each of spike length, number of grains spike^{-1}, grains weight spike^{-1}, ١٠٠٠- grain weight, biological yield and harvest index at rg and rp levels.Grain yield plant^{-1} exhibited positive and highly significant correlations with spike length, no. grains spike^{-1}, grains weight spike^{-1}, ١٠٠٠- grain weight, biological yield and harvest index and significant association with number of tillers plant^{-1} at rg and rp levels. Grain yield plant^{-1} was also negative and significantly correlated at rp level with number of spikes m^{-2}.Grain yield/fed showed highly significant and positive associations number of tillers plant^{-1}, number of grain spike^{-1}, grains weight spike^{-1}, ١٠٠٠- grain weight, number of spikes m^{-2}, grain yield plant^{-1}, straw yield, biological yield and harvest index at rg and rp levels. It had significant and positive rg and rp with spike length.

Stepwise results revealed that dry weight plant^{-1} (DWP) and number of leaves plant^{-1}(NLP) at young (١٠٥ days) age and dry weight plant^{-1}(DWP) at the late (١٣٠ days) age were the most yield contributors and had the largest part in grain yield (GY) variation. The relative contributions of harvest index, number of spikes m^{-2}, grains weight spike^{-1}, number of grains spike^{-1} and spike length in the total yield variation were ٢٨.٧%, ٢٤.٤%, ١٤.٣%, ٥.٥% and ١.٥%, respectively.

Key words: Wheat, Genotypes, Growth, Yield and yield components, Genetic parameters, Genotypic and phenotypic correlation, Stepwise regression.