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| <b>Article title</b>  | <b>Genetic Divergence in Advanced Bread Wheat Genotypes for Yield and Its Attributes</b>   |
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### **Abstract**

Studying genetic divergence of quantitative traits and its attributes towards yield is important for developing high yielding varieties. Nine advanced bread wheat genotypes along with three check parental varieties; Sids1, Sakha 93 and Giza 168 were investigated at the Experimental Farm of the Faculty of Agriculture (Demo farm, new reclaimed sandy loam soil), Fayoum University, Fayoum Governorate, during two growing seasons (2017/2018 and 2018/2019). The research was laid out in randomized complete block design (RCBD) with three replications. The analysis of variance revealed highly significant differences among the studied genotypes for all investigated traits. Mostly high broad sense heritability 97.52 & 96.49, 91.63 & 93.70 and 95.24 & 97.38% accompanied with high genetic advance 70.33 & 61.23, 60.50 & 56.88 and 46.29 & 57.27 were observed for plant height, grains spike<sup>-1</sup> and grain yield plant<sup>-1</sup> in both seasons, respectively. In addition to, high broad sense heritability with low genetic advance were noticed for the rest of the studied traits. 100-grain weight, grains spike<sup>-1</sup>, number of fertile tillers, spikelets spike<sup>-1</sup> and spike length exhibited positive and significant effect on grain yield plant<sup>-1</sup> in the 1<sup>st</sup> season, while in the 2<sup>nd</sup> season its effected only with grains spike<sup>-1</sup>, 100-grain weight and number of fertile tillers. Automatic multiple linear regression analysis was used to develop a fitted equation to a predicate. According to results forward stepwise regression was selected to predicate grain yield plant<sup>-1</sup> in two seasons. 90.2% of the total variation in grain yield/plant could be explained by variation in SI =100-grain weight, NGS =grains spike<sup>-1</sup>, NT = Number of fertile tillers, SS= Spikelets spike<sup>-1</sup> and SL= spike length in first season. 85.3 % of the total variation in grain yield/plant could be explained by variation in SI =100-grain weight, NGS =grains spike<sup>-1</sup>, and NT = Number of fertile tillers second season.

The main factors for the studied variables were created from the application of the factor analysis technique. Grain yield  $\text{ha}^{-1}$  (Y) can be predicted by the method of forwarding stepwise through applying the automatic linear regression analysis. Besides, the best prediction equation of grain yield  $\text{ha}^{-1}$  (Y) was formulated as:  $\hat{Y} = -14.36 + 0.11 \text{ number of grains spike}^{-1} (\text{NGS}) + 0.09 \text{ 1000-grain weight (THW)} + 0.04 \text{ number of spike m}^{-2} (\text{NSm}) + 0.03 \text{ days to 50\% heading (DF)} + 0.02 \text{ total chlorophyll content (TC)}$  with adjusted- $R^2$  (87.33%).