

Estimation of Some Genetic Parameters and Correlation in the Varieties of Bread Wheat under the Conditions of AL-Diwaniyah

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Abstract: A field experiment was carried out in the fields of one of the farmers in AL Diwaniyah Governorate for the winter season 2015/2016 using nine varieties of wheat bread (Tamoze 1, Tamoze 2, Maksebak, Sabah, Eba 95, Latifia, Eba 99, Abu Ghraib and Sham 6). RCBD Used design with three replicate in order to estimation of some genetic parameters and correlation of bread wheat varieties under the experiment Diwaniyah to determine the most effect characters on yield that can be used as guide to select and improve the yield . an account Genetic and phenotypic variation , correlation coefficient, inheritance ratio in broad and narrow Expected genetic improvement ratio for character hight plant , number of Branches , spike length , number of grains spike ,weight of 1000 and yield .

The results showed that there were significant differences between the cultivars, with the superiority of the Eba 99 by giving the highest rate of 1043.3 kg / dunum between the varieties. There were significant differences between the studied characters Abu99 the superiority in number of branches , length of spick , number of the seed spick and ,weight of 1000 grin their average (11.33, 12.0, 66.3 and 47.3 gram, respectively), which were positively reflected in grain yield.

The genetic, environmental and morphological differences of the studied character were significant and the values of the genetic and phenotypic factors were correlated to most traits and inheritance in the broad sense higher (0.592 - 0.728)

As an average percentage medal of most traits, but genetic and phenotypic correlation were significant in the desired direction of most yield and therefore yield can be considered as an electoral tool in breeding and plant improvement programs.

Keyword: varieties, wheat, genetic parameters, expected genetic improvement, Genetic link.

I. INTRODUCTION

Triticum estivum is one of the world's leading grain crops. It represents the main food for more than 2.5 billion people in the world. The productivity of the unit in Iraq is low and represents only 30% of the productivity of the World Area Unit. Therefore Iraq imports more than two thirds of its wheat needs [1]. The sensitivity of the wheat crop to environmental changes and conditions necessitates the study of environmental genetic interference that plays a role in changing the plant's phenotypic values , Understanding the nature of the environmental genetic interference inevitably prepares the researcher for the behavioral knowledge and response of these varieties and enables him to discover its genetic potential by synchronizing the growth stages with thermal and photovoltaic conditions Suitable reflected in increased productivity [2].

Despite of spread some genotypes and varieties of local and imported, the cultivation of this crop in Iraq is still below the required level, so it is important to breeding and improvement to make a significant increase in grain yield and improve the quality through the implementation of breeding and improvement programs, Evaluating of performance of the existing and introduced varieties is the first step of the breeding program and its testing in several environments will provide a lot of electoral evidence and provide an opportunity to evaluate the genetic and environmental effects that are helpful factors for the selection and genetic improvement expected, in addition to the associations that represent scale of the strength of relationship among them [3].

To improve the different traits it is important to estimate the expected genetic improvement as it is the largest application of the theory of quantitative inheritance in the programs of breeding and improvement of plants, which determine the method of election to improve the qualities, especially the grain. Genetic improvement expected to be the result of the multiplication of the intensity of selection in inheritance in the standard deviation of phenotypic variation [4]. [5] On the expected genetic improvement of a quantitative value as the sum of genetic improvement on the arithmetic average as a percentage.

The yield of grain characteristic is characterized quantities complex genes and is highly correlated with the growth characteristics and components of bread wheat Therefore, the knowledge of the genetic and appearance associations that serve the breeder in the diagnosis of the most relevant traits here is the importance of searching for superior varieties and evaluating their behaviour Genetics by studying the differences and phenotypic and genetic correlations between pairs of different quantitative characteristics and inheritance ratios in the broad and narrow sense. The estimation of some genetic information such as inheritance that provides information on the transmission of attributes from parents to their offspring as well as allows escaping the correlation coefficient is useful if the indirect selection of the secondary label is used to improve the basic character. Therefore, the success of the breeding methods depends on breaking the negative correlation between the components .The owner of the wheat and its quality

The study aims at evaluating the performance of a number of wheat varieties, estimating the components of variability, genetic and phenotypic links, inheritance and genetic improvement expected to reach the best species for adaptation as a breeding material prepared for the crop under the conditions of Diwaniyah Governorate.

II. Materials and Methods

A field experiment was carried out in the field of one of the farmers of Diwaniyah during the winter planting season (2015/2016) to study the estimation of some of the genetic parameters in nine varieties of bread wheat (tamoze 1, Tamoze 2, Mexibak, Sabah, Eba, 95, Latifia, Eba 99, Abu Ghraib and Sham 6) The General authority for agricultural research applied an experiment according to the design of complete random sectors (RCBD) with three replicates in sandy soil. The seeds were planted on 15/11 at 120 kg / ha on the lines of the distance between the line and the last 20 cm. Fertilizers were added according to the recommendations of the fertilizer with 50 kg / dunum of urea 46% nitrogen on the first two steps after 30 days of planting and the second at the point of expulsion of the ears and 50 kg / Dunums of phosphate fertilizer (Super Phosphate) at one time when tillage and field operations were conducted whenever needed.

The experimental unit area (5 x 4 m²), The total height of the plant (cm), the number of branches, the length of the spike (cm), the number of grains, the weight of 1000(g), the total Yield (kg / dunum) after collecting the data for studding yield and their classification and then analysis according to the design used, (Genetic and environmental) based on the expected mean variance according to the fixed model. The genetic and environmental variations were examined from zero in the way they were developed [6]. The differences between the phenotypic variables and the environmental [7], In the broad sense in the way he has explained [8], The limits of inheritance in the broad sense, [9] .and department as stated [10], were less than 40%, 40-60% average, and more than 60%, and the expected genetic improvement according to the method explained (6) are less than 10% and 10-30% are average and more than 30% are higher [11] . The environmental, genetic and morphological correlation coefficients between the pairs of yield were estimated [12].

III. Results and Discussion

The result in table (1) indicates that the analysis of variability of cultivars was significant and below the 5% probability of plant height, number of tiller , number of grains in spike, length of spike, weight of 1000 grain, and grain yield, except for weight of 1000, was insignificant. Genetic factors and their differences in response to the environment of varieties of varieties, which gives the breeder an opportunity to evaluate the performance on the one hand and the selection of the best qualities of educational programs agreed results with [13],[14].

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Table 1: Analysis of variance of the studied characters

Yeald grain/kg	Weig ht of 1000 grain /cm	Number of spike grains	Length of spike/cm m	Numbe r of tiller	Plant height/cm m	character df	s.o.v
20734.259	5.333	0.481	0.704	1.148	1.593	2	Rep
*30743.981	n.s13 5.917	*139.120	*4.565	*11.259	*215.42 6	8	Variety
11015.509	55.41 7	45.440	1.412	3.065	73.676	16	Error

Table (2) shows the average of the varieties of the studied traits. The differences were significant for the character. which wear excellent (Eba 99) in number of tillers, the length spick , the number of grains in the spike, and the weight 1000 grain, which were (11.3, 12.0 cm, 66.33 and 47.33 respectively) that effected on total yield which is the highest yield of 1043.33 kg / dunum but the sabah is excellent in other verity higher plant which gave (104 cm) ., and the less values of the studied traits among the other varieties, explain . Table (2) shows that differences in morale and superiority are due to variation in genetically modified species The results showed that there were significant differences between the averages of the traits, including [15],[16],[17].

Table 2: The mean of the studied characteristics in Diwaniyh

Yield/kg	Weight of 1000 grain/cm	Number of spike grains	Length of spike/cm	Number of tillers	Plant height/cm	Character Cultivars
785.000	32.333	61.000	9.333	8.000	80.000	Tamoze ʌ
700.000	30.333	60.000	9.000	6.333	83.000	Tamoze ʏ
853.333	31.333	60.000	9.000	6.000	95.667	Mexibak
983.333	38.333	61.333	11.000	9.667	104.667	Sabah
816.667	24.333	47.333	8.000	5.000	89.667	Eba ʌ°
853.333	34.333	63.333	8.667	8.000	93.000	Latifia
1043.333	47.333	66.333	12.000	11.333	102.667	Eba 99,
863.333	30.667	56.333	10.000	7.667	100.667	Abu Ghraib
863.333	27.000	46.667	9.333	8.667	95.333	Sham ʌ
181.674	n.s.	11.668	2.057	3.030	14.858	L.S.D 0.05

IV. Genetic parameters:

Table (3) shows some estimates of some of the statistical parameters of genetic characteristics of the studied traits to determine the validity of these varieties as a source of desired qualities through the knowledge of the quantitative variance in which these are the variance and standard error and the difference coefficient.

It is noted that there is an increase in the values of genetic and phenotypic variation compared to the environmental variability in the studied traits and gives evidence that the genes play a significant role in showing the character and hence the effective selection and gives the plant breeders the opportunity to select the genetic material in the breeding programs directly for their low impact in the environment.

The values of the environmental difference coefficient were low for the height of the plant and height of the spick and the number of grains was (5.280, 7.152 and 6.706, respectively), while the coefficient of genetic variation was mean to the number of branches and the weight of the one thousand respectively (21.049 ; 15.750, respectively).the phenotype different coefficient value is The number of branches, the weight of a thousand cubits, the length of the stems, the total number, the number of grains and the height of the plant respectively were 24.67, 20.466, 12.859, 11.738, 11.734 and 9.029 respectively.

These high values indicate the significant effect of environmental factors on the phenotypic expression of the characteristic (17). The same table indicates that the values of inheritance in the broad sense were within the average range of the weight of the grain and the height of the other yield, ranging from (0.592 - 0.728 according to [11].

Also the result (table 3) show that values of genetic improvement expected as a percentage of the general mean of the studied traits are (ranged between the low and medium of the studied traits as they were low for the plant height and the average in the characteristics of the number of tiller and the length of the number of grains in the spike and the weight of its thousand and its plant according by [18]. And where the coefficient of genetic variation was followed to the coefficient of phenotypic variation in its behaviour of most of the high qualities and values of inheritance in the broad sense reflected on the values of genetic improvement expected as a percentage. The results agreed with [19],[8],[16]. The values of phenotypic variation were high The winner I followed the recipe plant height and the number of grain and then 1000 garn weight (10247.9, 71.80, 46.37 and 45.30), respectively, and these indicators inferred from which the power capacity in the electoral process in the education programs and the possibility of utilization of the sum agreed results with the findings [8].

Table 3: Some statistical and genetic constants of the studied yield

Yield/kg	Weight of 1000 grain/gm	Number of spike grains	Length of spike/cm	Number of tillers	Plant height/cm	Character Parameter
862.407	32.889	58.037	9.593	7.852	93.852	Average
3671.836	18.472	15.147	0.471	1.022	24.559	environmental variation
3671.836	18.472	15.147	0.471	1.022	24.559	standard error
6576.157	26.833	31.227	1.051	2.731	47.250	Genetic variation
4743.637	21.176	21.344	0.698	1.713	33.141	standard error
10247.994	45.306	46.373	1.522	3.753	71.809	Phenotypic variation
2958.341	13.079	13.387	0.439	1.083	20.729	standard error
7.026	13.068	6.706	7.152	12.873	5.280	Environmental difference coefficient
9.403	15.750	9.629	10.687	21.049	7.324	Genetic difference coefficient
11.738	20.466	11.734	12.859	24.673	9.029	Phenotype difference coefficient
0.642	0.592	0.673	0.691	0.728	0.658	Broad inheritance
100.690	6.179	7.108	1.321	2.185	8.643	Expected genetic improvement
11.675	18.788	12.247	13.766	27.833	9.209	Expected genetic improvement as a percentage

V. Genetic correlation

The purpose of studying the correlations between the different yields is to identify the most relevant characteristics of the product to determine the experimental evidence that benefit the plant breeders for using them for selection and hybridization programs for the purpose of increasing the quantity of the yield. The quality of most studies indicates that the genetic correlation values are higher than the phenotypic correlation values, the phenotypic composition either in the case of the correlation of the genetic correlation values with the phenotypic correlation values will show significant changes in the elected personality more than expected. [10] Environmental genetic interference also reduces the association between the genetic and phenotypic values, For the amount of progress resulting from the election [2].

Table (4) shows the environmental, genetic and phenotypic correlation coefficients between the pairs of studied traits. The Correlation coefficient values are higher than the phenotypic correlation coefficients of the studied traits. The effect of the correlation was related to the traits of plant height, number of branches, length of sap, there was a significant environmental correlation in the number of grains with spike.

This is evidence that the increase in the components obtained led to an increase in the total yield. The results showed that there was a negative genetic correlation between the numbers of grains with the height of the plant. There is a high environmental correlation between the numbers of grains with the number of branches. The results indicated that the length of the spike was associated with genetically and phenotypic ally high with the height of the plant and the number of branches. Also, the number of branches was associated with genetically high correlation with plant height and a significant correlation of the same characteristic. With most qualities and thus can improve the status of the outcome through the direct election of its components agreed results with the findings [12],[14] at last The cultivar (Ebu 99) can be grown in more than one environment and season for better selection and to determine the stability of this variety under the conditions of the study environment

Table 4:Environmental, genetic and descriptive links to studied traits

Plant height	Number of tiller	Length of spike	Number spike grain	Weight 1000 grain	yield	Link	Characters
1	0.133	0.357	0.409	0.195	**0.745	rE	Plant height
1	**0.746	**0.808	-0.004	**0.788	**0.928	rG	
1	*0.557	**0.661	0.134	*0.518	**0.864	rP	
	1	**0.763	**0.670	**0.711	*0.514	rE	Number of tillers
	1	**0.943	0.406	**0.843	**0.913	rG	
	1	**0.890	0.484	**0.771	**0.785	rP	
		1	0.389	**0.724	**0.661	rE	Length of spike
		1	*0.602	**1.100	**0.886	rG	
		1	*0.534	**0.917	**0.810	rP	
			1	**0.799	*0.518	rE	Number spike grains
			1	**0.768	0.217	rG	
			1	**0.763	0.320	rP	
				1	0.421	rE	Weight 1000 grain
				1	**0.963	rG	
				1	**0.755	rP	
					1	rE	Yield
	r 0.05=0.497				1	rG	
	r 0.01=0.623				1	rP	

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