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Assessment of some genetic structures of Levantine corn under drought conditions

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Abstract

Maize is one of the most important grain crops in Egypt and the world. It is used in the feeding of animals and poultry. It is also used in many industries, such as starch, oil, fox sugar, etc. Recently, Syrian corn has been used to feed people in Egypt by mixing it by 20% with wheat flour in the making of bread. This study was conducted for the purpose of determining the nature of the genetic control action governing the hereditary possession of corn bearing hydrolysis, through the evaluation of 7 pure strains of white Levantine corn and hybrids resulting from interbreeding under water stress conditions and the identification of the best drought-tolerant genetic structures under sandy land conditions. The results showed that the average behavior of seven genetic compositions of corn of plant elevation traits, height of allows, line number / glucose, number of grain / line, weight of 100 seeds and grain/acre yield. The results indicate that there are moral differences between the genetic makeup of the classes under study. Genetic constitution 5 has given the highest values in most of the characteristics under study, and has given the lowest values to the elevation of plants, which indicates the importance of this genetic structure and that it can be used to improve these qualities.

Keywords: Genetic structures, Levantine corn, Drought conditions, Egypt.

Introduction

Maize is one of the most important grain crops in Egypt and the world. It is used in the feeding of animals and poultry. It is also used in many industries, such as starch, oil, fox sugar, etc. Recently, Syrian corn has been used to feed people in Egypt by mixing it by 20% with wheat flour in the making of bread.

Egypt produces about 6 million tons of Syrian corn a year, while the country's needs are estimated at double this figure. Maize imports, especially yellow for plant fodder factories, are low and do not meet the needs of the local market. For this reason, Egypt imports annual quantities of maize exceeding 5.5 million tons, most of which are from the United States, Argentina, Russia and Ukraine. This is why it is necessary to achieve self-sufficiency in the corn and to provide about 820 thousand tons imported from abroad through the expansion of maize cultivation in the new land after the improvement of its decomposition due to lack of ground moisture. The crop shortage resulting from exposure to drought is considered the most powerful motivation for researchers to improve the tolerance of the genetic makeup of the drought sorghum to reduce this shortage. (Carrow et al.,1990) The importance of the Syrian corn crop, which must be grown in the new lands to increase the amount of it produced, has already become clear. However, this expansion faces the problem of water shortage and high temperatures, which lead to drought, and therefore it was necessary to consider producing drought-tolerant maize varieties.

Aim of the study: The study is conducted for the purpose of determining the nature of the genetic control action governing the hereditary possession of corn bearing hydrolysis, through the evaluation of 7 pure strains of white Levantine corn and hybrids resulting from interbreeding under water stress conditions and the identification of the best drought-tolerant genetic structures under sandy land conditions.

Previous studies: Shiri et al. (2010) assessed 36 hybrids derived from hybridization between 18 illiterate strains and two detected species under normal irrigation and water stress conditions.

The results showed that the host and non-host genetic act governs the succession of the cereal crop under conditions of both normal irrigation and water

stress, with a greater role for the non-host genetic act.

The value of inheritance efficiency in the general sense and in the narrow sense under normal irrigation conditions was higher than under stress conditions .

The L8, L11 and L17 and the L15, L16 and L17 strains have given the general ability to combine high and moral under both normal irrigation and stress conditions, respectively.

Catharine and Bernardo (2013) assessed 238 strains of the Cham maize B37x Mo17 under water stress conditions. The results showed that the average cereal crop under stress was 52% under normal irrigation conditions, and inheritance efficiency was 37% under stress conditions and 60% under normal irrigation conditions .

. Abu el et al. (2014) studied the genetic differences between seven pure strains of Levantine corn and first generation hybrids resulting from interbreeding under both irrigation and financial stress conditions to distinguish the best genetic structures in the tolerance of hydro stress. The results indicated that water stress has led to a moral deficiency in the grain crop and most of the traits under study (rise in plants, number of days until 50% of the revolution , Until maturity, the length of the banana, the diameter of the banana, the number of lines / the ear, the number of grains / line and the weight of 100 grains), there were moral differences between the genetic structures in most of the characteristics under study, and the hybrid 405 x 160 was the most tolerant of the genetic makeup of the drought .

Materials and Methods

A field experiment was conducted in the summer season of 2019 to evaluate seven pure strains of yellow Cham maize under drought conditions .

10 plants of each genetic structure were taken to estimate the following characteristics :-

1) Plant height (cm)
2) Length of ear (cm) .
3) Number of lines/ ear
4) Number of grains / line .
5) 100 grams
6) Grain yield (ardeb/acre) .

Results and Discussion

The results in Table (1) show the average behavior of seven genetic compositions of corn of plant elevation traits, height of allows, line number / glucose, number of grain / line, weight of 100 seeds and grain/acre yield. The results indicate that there are moral differences between the genetic makeup of the classes under study.

Genetic constitution 5 has given the highest values in most of the characteristics under study, and has given the lowest values to the elevation of plants, which indicates the importance of this genetic structure and that it can be used to improve these qualities.

Table (1): Mean performance of seven maize parents and their F_1 crosses for yield and yield components.

Genotypes	Plant height (cm)	Ear length (cm)	No. of rows / ear	No. of grains / row	100- grain weight (g)	Grain yield (ard. /fad.)
1	192.0	13.0	14.0	18	16.349	6.033
2	174.0	14.5	12.0	23	20.864	9.689
3	255.0	15.5	14.0	25	22.525	11.295
4	180.0	12.1	12.0	31	18.355	10.590
5	170.0	17.5	12.0	37	30.473	20.590
6	193.0	14.5	14.0	30	27.017	16.032
7	212.7	13.0	14.0	28	25.162	14.311
L.S.D 0.05	6.45	0.61	2.04	4.12	0.77	0.32

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