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EVALUATION OF SOME SUNFLOWER HYBRIDS UNDER WATER STRESS CONDITIONS

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T H E S I S

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ABSTRACT

This investigation was carried out at Sakha Agricultural Research Station Farm, ARC,Kafr El-sheikh governorate, Egypt during the two growing summer seasons (2015 and 2016). Six parents namely; Line 4, Line 10, Line 16, Line 17, Line 63 and Giza 102, respectively were used todevelop sunflower hybrids which were evaluated under normal irrigation and two water stress conditions and compared with a check cultivar namely; Sakha 53. Through this study, agronomic characters, yield and its components, seed oil percent, general and specific combining ability, superiority over the check cultivar (Sakha 53),water consumptive use, water use efficiency and predicted cultivated area, seed and oil yields from saved water were studied for crosses and a check cultivar under the three water treatments which were; irrigation every 14 days (T_1),irrigation every 21 day (T_2) and irrigation every 28 days (T_3). Data recorded on ten guarded plants chosen at random. Data revealed that most of the variance due toirrigation treatments (I), genotypes (G),G × I, crosses (Cr), (GCA),(SCA),Crosses × I, GCA × I andSCA × I, showed highly significant differences for most traits under the three irrigation treatments and their combined analysis. On the other hand, positive and negative superiority percentage over the check cultivar (Sakha 53) under the three water treatments and their combined data were detected for all characters indicated that parental genotypes were genetically diverse.The parents P_6 (Giza 102) and P_5 (Line 63) considered as good combiners for earliness under the three irrigation treatments and their combined analysis. The parents P_1 (Line 4), P_2 (Line 10), P_6 (Giza 102) and P_5 (Line 63) considered as good combiners for head diameter, seed yield per plant**,** 100-seed weight, seed yield per faddan, seed oil content and oil yield /fad. under the three water treatments and their combined analysis.The values of water consumptive use were increased by decreasing irrigation intervals for the all studied genotypes. On the other hand,the values of water use efficiency increased by increasing irrigation intervals for the all studied genotypes. From the results, it could be concluded that the progeny of the crosses; Line 4 x Line 63, Line 4 x Giza 102, Line 10 x Line 63, Line 10 x Giza 102, Line 16 x Line 63, Line 17 x Line 63, Line 17 x Giza 102 and Line 63 x Giza 102 are the best for earliness. Also, the crosses; Line 4 x Line 10, Line 4 x Line 63, Line 4 x Giza 102, Line 10 x Line 63, Line 10 x Giza 102 and Line 63 x Giza 102 are the best for seed and oil yields /fad. and these crosses could be used as a good hybrids to cultivate sunflower under water stress conditions to cover a part of oil production gap in Egypt.In case of using the same amount of water used in T1 water treatment per faddan with irrigation intervals every 21 days, we can cultivate (1.60 fad.) which produce (1864.17 kg.) of seed which gave (684.70 kg.) of edible oil.

CONTENTS

Page

I. INTRODUCTION.....1

II. REVIEW OF LITERATURE.....4

1. Effect of water stress on agronomic, yield and yield component characters in sunflower (*Helianthus annuus* L.).....4
2. General (GCA) and specific (SCA) combining abilities of sunflower genotypes... 13
3. Superiority percentage.....27
4. Soil-Water relations.....34

III. Materials and Methods.....40

IV. Results and Discussion.....53

4.1. Mean performance of the genotypes.....53
4.2. Analysis of variance:.....65
4.3. Combining ability analysis.....69
4.3.1. Analysis of variance.....71
4.3.2. General combining ability effects.....76
4.3.3. Specific combining ability effects.....82
4.4. Superiority percentage.....90
4.5. Soil-Water relations.....97
a. Water consumptive use (C.U).....97
b. Water use efficiency (W.U.E).....108

V. SUMMARY.....112

VI. REFERENCES.....122

VII. ARABIC SUMMARY

LIST OF TABLES

Table (1): Soil mechanical and chemical analysis for the experimental site in 2016 season. 40

Table (2): Means values of chemical characteristics for the experimental site before cultivation in the growing season (2016)..... 40

Table (3): Physical properties of the soil and some water constants at the experimental site 41

Table (4): Means of some meteorological data for Kafr El-Sheikh area during 2015 and 2016 growing seasons..... 41

Table (5): Origin and some agronomic characteristics of the lines used in this work..... 42

Table (6): Dates of irrigation according to water applied intervals in 2016 summer season. 43

Table (7): The form of analysis of variance and expected mean squares for a single experiment..... 47

Table (8): The form of the analysis of variance of the combined data for the entries in the three water treatments and the interactions between water treatments..... 48

Table (9): Form of analysis of variance for single experiments as method 4 model 1 of Grifing (1956)..... 51

Table (10): Form of the analysis of variance and expected mean squares for testing genetic components of variance of crosses and their partitions plus possible interaction... 52

Table (11): Mean performance of 16 genotypes and the check cultivar for 12 traits under three water treatments and their combined data. 54

Table (12): Analysis of variance of 16 genotypes for 12 traits under three water treatments and their combined data. 66

Table (13): Analysis of variance using method 4 model 1 according to **Griifing** (1956) for 12 traits under three water treatments and their combined data 72

Table (14): Estimates of general combining ability (GCA) effects of the parental genotypes for the studied traits under the three water treatments and their combined data 77

Table (15): Estimates of specific combining ability (SCA) effects of F_1 crosses for the studied traits under the three water treatments and their combined data. 83

Table (16): Estimation of heterosis over the check cultivar (superiority) of F_1 crosses for all studied traits under the three water treatments. 91

Table (17): Decreasing in seed, oil yield characters in percentage and saved water in (m3) and percentage for T_2 as compared with T_1 irrigation treatments in 2016 season.. 98

Table (18): Decreasing in seed, oil yield characters in percentage and saved water in (m^3) and percentage for T_3 as compared with T_1 irrigation treatments in 2016 season.. 99

Table (19): Decreasing in seed, oil yield characters in percentage and saved water in (m^3) and percentage for T_3 as compared with T_2 irrigation treatments in 2016 season. 100

Table (20): Predicted cultivated area, seed and oil yields from saved water used in T_2 irrigation treatment instead of T_1 irrigation treatment. 101

Table (21): Water use efficiency in m^3 per kilogram seed of sunflower as affected by irrigation treatments in 2016 season. 109