شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

Heterosis and Combining Ability in Wheat

BY

HASSAN SALEH SULEIMAN

B.Sc. Agric. Sci. (Agronomy), Fac. Agric., Damascus Univ., Syria, 2002

THESIS

Submitted in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

In

Agricultural Sciences
(Agronomy)

Department of Agronomy
Faculty of Agriculture
Cairo University
EGYPT

2011

APPROVAL SHEET

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Date 8/5/2011

SUPERVISION SHEET

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ABSTRACT

This investigation was carried out at El-Giza Agricultural Research Station of the Agricultural Research Center (ARC) during two successive seasons 2008-2009 and 2009-2010. The main objective was to study performance, heterosis, combining ability and interrelationships among traits for earliness, grain filling and grain yield and its attributes in bread wheat (*Triticum aestivum* L.). Seven bread wheat genotypes *viz.*, Sids 12(P_1), Giza 168(P_2), Sakha 93(P_3), Gemmeiza 9(P_4), Line 109(P_5), Line 147(P_6) and Line 172(P_7) were crossed in a half diallel mating design to produce 21 F_1 hybrids in 2008-2009. Parents and 21 F_1 hybrids were evaluated in 2009-2010. Significant mean squares due to genotypes, parents and crosses were detected for all traits. The parents *vs.* crosses mean squares as indication average of heterosis were highly significant for all characters. Average desirable heterotic effects relative to better-parent across all studied hybrids were detected for all traits, except grain filling period and harvest index. Significant positive heterobeltiosis for grain yield/plant was recorded for 10 crosses where the highest cross $P_3 \times P_6$ (37.83%). Analysis showed that both general combining ability (GCA) and specific combining ability (SCA) variances were highly significant for all studied traits except the mean square of GCA for number of spikelets/spike. The ratio of GCA/SCA mean squares was more than unity for all traits except number of spikelets/spike, number of kernels/spike and grain filling rate. Additive gene effects were more important and played a major role in the inheritance of all studied traits. However, non-additive gene effects played a major role in the inheritance of number of spikelets/spike, number of kernels/spike and grain filling rate. Line 147 was the best general combiner for grain yield/plant, grain filling rate and number of spikes/plant. The cross $P_1 \times P_3$ showed superiority in SCA effects for number of kernels/spike, grain filling rate and grain yield/plant. Grain yield/plant showed highly significant phenotypic correlation with all studied traits except plant height.

Key words: Bread wheat, *Triticum aestivum*, Heterosis, Combining ability, Phenotypic and genotypic correlations.

DEDICATION

I dedicate this work to my mother, my father and my wife for their patience and help, as well as to my sisters and brothers for all the support they hearty offered during the period of my post graduate study.