

**ESTIMATION OF GENETIC PARAMETERS FOR
AGRONOMIC TRAITS IN DIALLEL
CROSSES OF BREAD WHEAT
UNDER DIFFERENT
SOWING DATES**

By

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تقدير المعالم الوراثية للصفات المحصولية في هجن تبادلية من قمح الخبز تحت مواعيد زراعة مختلفة

رسالة مقدمة من

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للحصول على
درجة الماجستير في العلوم الزراعية
(محاصيل)

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ABSTRACT

Sami Sheikhmous Othman: Estimation of Genetic Parameters for Agronomic Traits in Diallel Crosses of Bread Wheat under Different Sowing Dates. Unpublished M. Sc. Thesis, Department of Agronomy, Faculty of Agriculture, Ain Shams University, 2010.

This investigation aimed to study performance, heretosis, combining ability, heritability, interrelationships among traits and path coefficient analysis for grain yield and its attributes in bread wheat (*Triticum aestivum*, L.) as affected by sowing dates. Six parents included three local cvs. namely; Giza 168 (P1), Sakha 94 (P2) and Gemmeiza 10 (P6) and three Syrian cvs. namely; Cham 8 (P3), Bohouth 6 (P4) and Cham 4 (P5) were used in this study. The parents were crossed in all possible combinations, excluding reciprocals in 2007/2008 season, and a total of 15 F₁ hybrids were obtained. In 2008/2009 season, the six parents along with their 15 F₁'s were evaluated for the studied traits at three sowing dates, i.e. 23rd of Oct. (the early sowing), 16th of Nov. (the recommended sowing) and 13th of Dec. (the late sowing). A field experiment was devoted for each sowing date at the Experimental Farm for Faculty of Agriculture, Ain Shams University at Shalakan, Kalubia Governorate.

The results revealed that mean squares due to sowing dates, genotypes and genotypes x sowing dates interaction were significant for most of the studied traits. Delaying sowing date to Dec. caused substantial reduction in all studied traits except heading and anthesis dates and grain filling rate which increased by delaying sowing date. However, the two local cvs. Giza 168 and Sakha 94 appeared to be more suitable for growing on the early sowing than other cvs. Also the crosses; P1 x P2, P1 x P3 and P2 x P3 were superior in grain yield

per plant and in most of its components under different sowing dates. These genotypes were also earlier in maturity than other genotypes.

Values of heterosis relative to better parents were greatly differed at different sowing dates and few crosses exhibited significant useful heterosis in all traits studied. The positive useful heterosis values ranged from 6.14 % in the cross P3 x P4 for plant height on the late sowing to 52.75% in the cross P4 x P6 for no. of spikes/plant on the recommended sowing. However, negative useful heterosis values ranged from -8.07 % in the cross P2 × P3 for grain filling period on the recommended to -1.21% in the cross P2× P4 for maturity date on the recommended sowing also.

General and specific combining ability mean squares indicated the importance of both additive and non-additive gene effects in the inheritance of the traits studied with few exceptions. However, the additive effect was more important than the non-additive effects in the inheritance of no. of spikelets /spike, no. of kernels/spike, 1000-kernel weight and harvest index while, the non-additive effects were more important than the additive effects in the inheritance of grain filling period and flag leaf area.

High and moderate values of narrow sense heritability were obtained for some traits ranging from 54.36 % for spike length at the recommended sowing date to 92.23 % for no. of spikelets / spike over the three sowing dates. Moderate and low narrow sense heritability values were obtained for some traits.

The results of path coefficient analysis showed that number of kernels/ spike and 1000-kernel weight at different environments proved to be the major grain yield contributors. Thus the breeders should take into consideration these two traits as selection criteria for wheat yield improvement under these environments.

Key words: Bread wheat,, *Triticum aestivum* , Sowing date, Heterosis, Combining ability, Heritability, Phenotypic correlation coefficient, Path coefficient analysis.

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