GENOTYPE X ENVIRONMENT INTERACTION AND STABILITY PARAMETERS OF AGRONOMIC AND QUALITY TRAITS OF SOME FLAX GENOTYPES

By

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M.Sc. Agric. Sc. (Agronomy), Ain Shams University, 2003

A thesis submitted in partial fulfillment
of
the requirements for the degree of

DOCTOR OF PHILOSOPHY
in
Agricultural Science
(Agronomy)

Department of Agronomy
Faculty of Agriculture
Ain Shams University

2010

Approval Sheet

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ABSTRACT

Sabah Mohamed Abo El-Komsan: Genotype x Environment Interaction and Stability Parameters of Agronomic and Quality Traits of Some Flax Genotypes. Unpublished Ph.D. Thesis, Department of Agronomy, Faculty of Agriculture, Ain Shams University, 2010.

Fourteen flax genotypes were evaluated for mean performance and stability of straw and seed yields and some other agronomic and quality traits under three locations namely; Etay El-Barood (El-Behiera), Sakha (Kafr El-Sheikh) and Gemmiza (Gharbia), Agricultural Research Stations and three nitrogen fertilization levels, 30, 45 and 60 kg N/fed during 2005/2006 and 2006/2007 seasons. Six field experiments were carried out over the three locations in both seasons. Split plot design with three replications for each location. Nitrogen fertilization levels and genotypes were randomly allocated in main and sub-plots, respectively. Single and combined analysis of variance were achieved for data obtained in each season. Phenotypic stability of genotypes across 18 environments was computed according to **Eberhart and Russell (1966).**

The results confirmed the existence of wide variation among flax genotypes and their performance reflected the significant effects of changes in locations and nitrogen fertilization levels as well as the interaction between them for all studied traits with some exceptions.

Means of all traits were significantly increased with increasing nitrogen fertilization levels from 30, 45 up to 60 kg N/fed except fiber fineness which decreased by increasing nitrogen levels in the three locations as well as combined analysis in both seasons. Gemmiza location was superior over the two other locations in most studied traits, i.e. straw yield/plant, number of fruiting branches, stem diameter, seed yield/plant, no. of capsules/plant and 1000-seed weight in the first and second seasons, as well as it was also superior for plant height, technical length, no. of seeds/capsule, fiber length and oil percentage in the first season

only while Sakha location come in the second rank which had high values of plant height, technical length, no. of seeds/ capsule and fiber length in the second season and fiber percentage in the first season, as well as maturity dates and protein percentage in both seasons. On the other side, Etay El-Barood come in the last rank which gave high values only for upper branches zone length in the first season and fiber and oil percentage in the second season as well as fiber fineness in both seasons.

The two strains S. 2419/1/1 and S. 402/1 proved to be the best general adapted genotypes for straw yield and some of its related traits. The strain S.435/11/10/3 exhibited specific adaptability to favorable environments such as Gemmiza (Gharbia) and high nitrogen level. The two strains S. 2465/1/3 and S.16 proved to be the best adapted genotypes for seed yield and some of its related traits. Thus these five good genotypes may be recommended to be propagated and grown commercially as new elite varieties.

Key Words: Flax, *Linum usitatissimum*, L. Nitrogen fertilization, Locations, Genotype x Environment interaction, Stability

ACKNOWLEDGMENT

First of all, ultimate thanks are due to Allah,
Who without his aid this work could not be done

I wish to express my sincere gratitude to Professor Dr. **Abd El-Maksoud Mahrous El-Marakby,** Professor Emeritus of Agronomy, Faculty of Agriculture, Ain Shams University for his supervision, drawing the plan of the work, valuable help, and continuous encouragement and reviewing the manuscript.

My sincere thanks and appreciation to Prof. **Dr.** A**faf Mohamed Tolba** Professor of Agronomy, Faculty of Agriculture, Ain Shams University for her help during the progress of this study.

My great thanks are due to **Prof. Dr. Amna, H.H. El-Sweify**, Chief Researcher, Field Crops Research Institute, Agriculture Research Center for her supervision, kind help and reviewing the manuscript.

My gratitude is also offered to all the staff members and fellow colleagues of the Department of Agronomy, Faculty of Agriculture, Ain Shams University, for their help and support during the course of this work.

Sincere thanks are due to all the staff members and colleagues of the Fiber Research Section, Field Crops Research Institute, Agriculture Research center for providing facilities and offering support and encouragement especially **Prof. Dr. Hussein M. Abo-Kaied.**

I am particularly indebted to my family for their moral support understanding and patience.

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