بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

PERFORMANCE AND IMPROVEMENT OF YIELD AND BULB QUALITY OF SOME ONION GENOTYPES

By

HAMED HASSAN BARAKAT

B.Sc. Agric. Sci. (Plant Production), Fac. Agric., Cairo Univ., 2012

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE

In

Agricultural Sciences

(Vegetable Crops)

Department of Vegetable Crops
Faculty of Agriculture
Cairo University
EGYPT

2021

Format Reviewer **Vice Dean of Graduate Studies**

APPROVAL SHEET

PERFORMANCE AND IMPROVEMENT OF YIELD AND BULB QUALITY OF SOME ONION GENOTYPES

M.Sc. Thesis
In
Agric. Sci. (Vegetable Crops)

By

HAMED HASSAN BARAKAT

B.Sc. Agric. Sci. (Plant Production), Fac. Agric., Cairo Univ., 2012

APPROVAL COMMITTEE

Dr. AHMED HELMY HUSSEIN .....
Head Researcher, Horticulture Research Institute

Dr. AHMED ALI GHARIB.....
Professor of Vegetable Crops, Fac. Agric., Cairo University

Dr. KHALED EL-SAYED ALI ABDEL-ATI …….....
Professor of Vegetable Crops, Fac. Agric., Cairo University

Dr. AHMED ABDEL-MONEIM HASSAN ……..……
Professor of Vegetable Crops, Fac. Agric., Cairo University

Date: 2 / 9 / 2021

SUPERVISION SHEET

PERFORMANCE AND IMPROVEMENT OF YIELD AND BULB QUALITY OF SOME ONION GENOTYPES

M.Sc. Thesis
In
Agricultural Sci. (Vegetable Crops)

By

HAMED HASSAN BARAKAT

B.Sc. Agric. Sci. (Plant Production), Fac. Agric., Cairo Univ., 2012

SUPERVISION COMMITTEE

Dr. AHMED ABDEL-MONEIM HASSAN
Professor of Vegetable Crops, Fac. Agric., Cairo University

Dr. KHALED EL-SAYED ALI ABDEL-ATI
Professor of Vegetable Crops, Fac. Agric., Cairo University

Dr. ABDEL-MEGIUD MABROUK ABDEL-MEGIUD ABO-DAHAB
Head Researcher of Onion Res. Department, Field Crops Res. Inst., Agric. Res. Cent., Giza, Egypt

Name of Candidate: Hamed Hassan Barakat **Degree:** M.Sc.
Title of Thesis: Performance and Improvement of Yield and Bulb Quality of some Onion Genotypes
Supervisors: Dr. Ahmed Abdel-Moneim Hassan
Dr. Khaled El-Sayed Ali Abdel-Ati
Dr. AbdEl-Megiud Mabrouk AbdEl-Megiud Abo-Dahab
Department: Vegetable Crops **Date:** 2 / 9 / 2021

ABSTRACT

This study was conducted during 2015 to 2017 at El-Giza Research Station, Field Crops Research Institute, Agriculture Research Center, Ministry of Agriculture, Egypt. Fifteen onion genotypes were evaluated in two field experiments conducted with all recommended cultural practices and insectsides. In the first experiment, protective and systemic recommended fungicides against downy mildew were used, while the second was conducted without spraying fungicides against downy mildew. Randomized complete block design with three replicates was used in both experiments. Studied characters were disease severity (DS%) for downy mildew, total yield (TY), marketable yield (MY), average bulb weight (ABW), number of complete rings (NCR), number of growing centers (NGC), total soluble solids (TSS%) and bulb dry matter percentage (BDM%). Genotypes Yellow Creole, Ori Yellow, Composite 16 Large Oblong, Giza Red and Giza 6 Mohassan recorded low DS% under both control and no control of downy mildew which reflect their adaptability and stability performance under different environments. Under both control and no control of downy mildew, superior genotype were Giza White, Composite 16 White, Composite 9 Globe, Giza Red and Giza 6 Mohassan in TY; Giza 6 Mohassan and Ori Yellow in MY; and Ori Yellow, Giza 6 Mohassan, Composite 16 Large Oblong and Yellow Creole in ABW. Genotypes Beth Alpha, Texas Early Yellow Grano, Yellow Creole and Composite 9 Globe were higher in NCR and exhibited the lowest NGC per bulb under control and no control conditions of downy mildew disease. Genotypes Harla White, Deko White, Composite 16 White and Giza White showed superiority in TSS% and BDM% under both control and no control conditions of downy mildew disease. Genetic parameters, viz., genotypic (GCV%), phenotypic (PCV%) coefficients, broad sense heritability (h^2_{bs}), genetic advance (GA) and genetic advance as percentage of mean (GAM%) were estimated. Estimates of PCV were medium for TY, MY, ABW, NGC, TSS and DM, and high for DS%. Estimates of GCV were medium for TY, MY, ABW, NGC, TSS% and DM%, and high for DS%. Most of the studied traits showed low estimates of GA and high estimates of GAM% and h^2_{bs}. One selection cycle was carried out to select bulbs of cvs Giza White and Giza 20 with high TSS% (H-TSS-P_1), low TSS% (L-TSS-P_1) and bulbs with SGC (SGC-P_1) to improve their internal bulb quality. Progenies of the three selected populations were evaluated along with original population (O-P_0) in RCBD with three replicates. In cv. Giza White, one selection cycle increased TSS% from 14.6% in P_0 to 15.5% in H-TSS -P_1, decreased NGC from 2.18 in P_0 to 1.9 in SGC-P_1 and decreased TSS from 14.6% in P_0 to 14.08% in L-TSS-P_1. In cv. Giza 20, one selection cycle increased TSS% from 13.6% in P_0 to 15.4% in H-TSS-P_1, decreased NGC from 2.2 in P_0 to 1.59 in SGC-P_1 and decreased TSS from 13.6% in P_0 to 10.1% in L-TSS-P_1.

Key words: Onion, *Allium cepa*, bulb quality, heritability, mass selection.

DEDICATION

Finally, I would like to conclude by expressing my gratitude to my parents, sisters, brothers, wife and kids for their continued support and encouragement.

ACKNOWLEDGEMENT

Foremost and above all, I wish to thank Allah for giving me the strength, determination, and hope to complete this thesis.

Then, I want to express my deepest appreciation to my supervisor, ***Dr. Ahmed Abdel-Moneim Hassan****, Professor of Vegetable Crops, Faculty of Agriculture, Cairo University, for his guidance, help, kindness, patience, effort, and sacrifice of his time in supervising me in order to accomplish my thesis.*

Also, I would like to express my sincere thanks, gratitude, and appreciation to my supervisor, ***Dr. Khaled El-Sayed Ali Abdel-Ati****, Professor of Vegetable Crops, Faculty of Agriculture, Cairo University, who has supported me throughout my thesis with his patience, knowledge, support, helpful suggestions, and feedback to complete this thesis.*

Moreover, special thanks, gratitude, and respect are directed to my supervisor, ***Dr. ABDEL-MEGIUD MABROUK ABDEL-MEGIUD ABO-DAHAB****, Head of Onion Res. Department, Field Crops Res. Inst., Agric. Res. Cent., for patience, support, feedback and helpful suggestions.*

Thanks are also due to members of the Vegetable Crops Department, Faculty of Agriculture, Cairo University and research staff of the Onion Res. Department, Field Crops Research Institute.