Mona Maghraby

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني

Mona Maghraby

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

EFFECT OF GRAFTING ON THE TOLERANCE OF CUCUMBER TO DROUGHT STRESS

By

SAMAR HOSNY MOHAMED HASANEIN

B.Sc. Agric. Sci. (Plant Production), Fac. Agric., Cairo Univ., 2015

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

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Title of Thesis: Effect of Grafting on the Tolerance of Cucumber to Drought stress
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Department: Vegetables Crops **Branch:**
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ABSTRACT

The influence of several cucurbit rootstocks on cucumber growth, yield and quality, and chemical composition of leaves and fruits under drought stress was investigated throughout the summer seasons of 2018 and 2019. The experiment was implemented at the Eastern Experimental Station of the Faculty of Agriculture, Cairo University. The study contained 12 treatments with three replicates in a split-plot design. The main plot had two levels of water irrigation, 50% and 100% of cucumber water requirements, and the sub-main plot had five rootstocks: 1- Bottle Gourd (*Lagenaria siceraria*), 2- Luffa (*Luffa egyptiaca*), 3- Squash (*Cucurbita pepo*), 4- Pumpkin (*Cucurbita maxima*), and 5-Shintoza (*Cucurbita maxima* x *Cucurbita moschata*) along with cucumber, cv. Hayel was planted without grafting as a control treatment. Drought stress treatment (50%) reduced plant height, leaf area, fruit length, K concentration of fruits, and membrane stability index significantly as compared to conventional irrigation (100%). However, the concentration of proline in leaves showed an inverse relationship. The water regimes had no effect on photosynthesis, stomatal conductance, transpiration, relative water content, chlorophyll readings, fruit quality (fruit weight, diameter, and TSS content), marketable, non-marketable, and total yield, K percent of leaves, P concentration of fruits, and leaf electrolyte leakage. Comparing to the control, grafting cucumber onto luffa rootstock resulted in significant reductions in plant height, fruit weight, total sugar content of fruits, P percent, and K percent in leaves, whereas grafting cucumber onto bottle gourd resulted in significant increases in leaf area, total sugar content of fruits, P concentration of fruits, marketable, and total yield of cucumber. Furthermore, grafting cucumber onto pumpkin boosted relative water content, non-marketable yield, and overall sugar content considerably. In addition, grafting cucumber onto shintoza rootstock resulted in lower N and P concentrations in the fruits, as well as lower overall sugar content.

Key words: Cucumber, grafting, rootstock, drought stress, vegetative growth, fruit characters, yield, nutrients.

DEDICATION

I dedicate this work to my late father, he never stopped sharing his wisdom, tutelage, support and encouragement to study. I will always love him.

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LIST OF ABREVIATIONS

Abbreviation	Full name
A	Photosynthetic rate
AET	Actual evapotranspiration
DAT	Day after transplanting
EL	Electrolyte leakage
$\mathbf{E_{pan}}$	Pan evaporation
ET	evapotranspiration
Etc	Crop evapotranspiration
FAO	Food and Agriculture Organization
Gs	Stomatal conductance
I	Irrigation
OMF	Organic mineral fertiliser
PC	Pot water capacity
RWC	Relative water content
TI	Tensiometer based irrigation
TSS	Total soluble solids
WUE	Water use efficiency

CONTENTS