USE OF SOME BIO-STIMULANTS AND AMINO ACIDS APPLICATION FOR IMPROVING THE GROWTH, YIELD AND QUALITY OF CUCUMBER FRUITS UNDER GREENHOUSE CONDITIONS

By

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B.Sc. Agric. Sci. (Horticulture), Fac. Agric., Cairo Univ., 2000
M.Sc. Agric. Sci. (Vegetable Crops), Fac. Agric., Cairo Univ., 2008

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

In

Agricultural Sciences
(Vegetable Crops)

Department of Vegetable Crops
Faculty of Agriculture
Cairo University
EGYPT

2016

APPROVAL SHEET

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Title of Thesis: Use of Some Bio-Stimulants and Amino Acids Application for Improving the Growth, Yield and Quality of Cucumber Fruits under Greenhouse Conditions.

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Department: Vegetable Crops. **Approval:** 20 / 7 /2016

ABSTRACT

The current study was ccted in the greenhouse of the Faculty of Agriculture, Cairo University during 2012/3013 and 2014/2015 early autumn seasons to study the effect of amino acids as foliar application and using four bio-stimulants; *viz.*, microbial inoculants, mixture of nitrogen fixing bacteria (*Azotobacter sp*), phosphate dissolving bacteria (*Bacillus megaterium*) and potassium dissolving bacteria (*Bacillus circulans*), humic acid, effective microorganisms (EM) and yeast extract strain (*Saccharomyces cerevisiae*) as soil fertilizer on vegetative growth characters, chemical composition, yield and its components as well as fruit quality of cucumber cv. Safa 62. The experiment treatments which were the combinations between amino acids (0 and 2 g/l) and four bio-stimulants were arranged in a split plot design experiment with three replicates in addition to spraying with tap water (control). Results indicated that spraying cucumber plants with amino acids significantly affected plant length, number of leaves, leaf area, N and K content in leaves, TSS and NP content in fruits in both seasons. Bio-stimulants increased all characters as compared with untreated control. Microbial inoculants gave the highest significant values plant length, number of leaves, average leaf area, dry weight, chlorophyll content of leaves and number of fruits/m^2, content of N and K in leaves. The highest significant values of NPK content in leaves were recorded with microbial inoculants followed by EM as compared with untreated control. However, microbial inoculants, humic acid and EM gave the highest values with no significance between them of dry weight of leaves and TSS% compared with yeast extract and control treatment during both seasons. Microbial inoculants gave the highest early and total yield/m^2 in both seasons, except average fruit weight in the second season only compared with the other bio-stimulants. Microbial inoculants gave the lowest value of nitrate concentration of fruits compared with the other bio-stimulants. Humic acid gave the highest values on fruit length as compared with untreated control. EM gave the highest values of TSS as compared with untreated control. The combination effect of bio-stimulants and amino acids seemed to increase all studied characters. Production cucumber fruits and their quality can be improved by using of foliar application amino acids (2 g/l) combined microbial inoculants (7.5 g/100 m^2) or EM (1.5 l/100 m^2).

Key words: Cucumber, bio-stimulants, amino acids, microbial inoculants, humic acid, effective microorganisms (EM), yeast extract.

DEDICATION

A deep and honest respect and esteem to my mother whose teaching me self-motivation and self-discipline at early stages and kept me in high spirits during my preparation for the Ph.D. Therefore, I dedicate all this effort to her.

ACKNOWLEDGEMENT

Every stage of my life has always been blessed with people that have significant beneficial impacts on me. Prof ***Dr. Said Abdalla Shehata****, Professor of Vegetable Crops, Fac. Agric., Cairo Univ., my major advisor, is one of such people. I am grateful for his guidance. I was able to tap from his wealth of academic knowledge and his attributes outside academics, continued assistance. Thanks are due to* ***Dr. Hassan Ali Hassan,*** *Associate Professor of Vegetable Crops, Fac. Agric., Cairo Univ., for his readiness to help me at all times throughout the thesis and constructive guidance through the course of study. I wish to express my infinite thanks and deep appreciation to* ***Dr. Ahmed Abdel-Moneim Tawfik,*** *Head Researcher of Vegetable Crops, Horticulture Res. Inst., ARC. for encouragement, supervision, suggesting the problem and was my continued assistance.*

Sincere thanks are also due to ***Dr. Said Zakaria Abd-El-Rahman****, Head Researcher of Vegetable Handling, Horticulture Res. Inst., ARC. who agreed to be my outside reader, I truly appreciate what he has done for me . I also thank* ***Dr. Abd-Alla Bardisi Ahmed****, Professor of Vegetable Crops, Fac. Agric., Zagazig Univ., and* ***Dr. Kawther Kamel****, Professor of Vegetable Crops, Fac. Agric., Mansoura Univ., for providing facilities to me.*

Special thanks and appreciation to my God who helped with finishing my thesis.

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