شبكة المعلومات الجامعية

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

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالأصل

INNOVATED SYSTEM TO INCREASE GREENHOUSE VEGETABLE PRODUCTION

By

HEBA SABRY ABED-ALRHMAN SABET

B.Sc. Agric. Sci. (Agricultural Engineering), Fac. Agric., Cairo Univ., 2005
M.Sc. Agric. Sci. (Agricultural Engineering), Fac. Agric., Cairo Univ., 2013

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

In

Agricultural Sciences
(Agricultural Engineering)

Department of Agricultural Engineering
Faculty of Agriculture
Cairo University
EGYPT

2019

Format reviewer **Vice Dean of Graduate Studies**

APPROVAL SHEET

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APPROVAL COMMITTEE

Dr. TAREK ZAKI HASSAN FOUDA……..……....……
Professor of Agricultural Engineering, Fac. Agric., Tanta University

Dr. KHALED KHALIL IBRAHEEM HEGAB…….....
Professor of Agricultural Engineering, Fac. Agric., Cairo University

Dr. YOUSSEF FARAG SHAROBEEM……..…….
Head Researcher, Agric. Eng., Res. Inst. Research Center

Dr. GAMAL EL-DEIN MOHAMED NASR…….....……
Professor of Agricultural Engineering, Fac. Agric., Cairo University

Date: 29 /12 /2019

SUPERVISION SHEET

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M.Sc. Agric. Sci. (Agricultural Engineering), Fac. Agric., Cairo Univ., 2013

SUPERVISION COMMITTEE

Dr.GAMAL EL-DEIN MOHAMED NASR
Professor of Agricultural Engineering, Fac. Agric., Cairo University

Dr. ESSAM MOHAMED ABDEL MOATY DARWISH
Associate Professor of Plant Physiology, Fac. Agric., Cairo University

Dr. YOUSSEF FARAG SHAROBEEM
Head Researcher, Agric. Eng., Res. Inst. Research Center

Name of Gandidate: Heba Sabry Abed Al-Rhman Sabet **Degree:** Ph.D.
Title of Thesis: Innovated System to Increase Greenhouse Vegetable Production.
Supervisors: Dr.Gamal El-Dein Mohamed Nasr
Dr. Essam Mohamed Abdel Moaty Darwish
Dr. Youssef Farag Sharobeem
Department: Agricultural engineering **Branch:** Agricultural engineering
Date: 29 / 12 / 2019

ABSTRACT

The study aims to use modern technologies based on ultrasound to increase production of vegetables in greenhouses. The experiment was carried out using hydroponic Nutrient Film Technique system (NFT) with three levels (A shape) in Giza governorate, through four productive periods during the agricultural seasons of 2016/2017 under greenhouse growing conditions. Ultrasound device designed and assembled locally to generate different frequencies, sound pressure levels (SPLs), exposure periods, and distances from the source of generator and plant in vertical and horizontal level. The present study investigates the influence of ultrasound wave exposure on growth of lettuce (*Lactuca sativa* L.) and strawberry (*Festival).* The experiment include of: two types of ultrasound electronic circuit: first circuit applied at 40 kHz and adjustable power 18W. The second circuit applied at 20, 30 and 40 kHz and adjustable power 40 W, each group was exposed to various ultrasound interval times range from (0, 60, 300 and 600 sec), at different source (0-30-60 cm) in vertical level; It found that the used of ultrasound waves was suitable to improve in plant growth for lettuce in most growth characters especially when used at time 60sec, distance zero cm (horizontal) of device and frequency 30kHz second circuit -100dB - 40W which gave the increased of about 3.60, 14.16, 21.27, 23.87, 20.49, 10.17, 0.49, 15.41, 16.10, 4.8, 3.60% for the properties of number of leaves, plant height, fresh weight of shoot and root, shoot dry weight, root dry weight, stem diameter, stem length, root length, chlorophyll ratio and leaves area of lettuce at harvest, respectively. While decreased stem firmness at 12.84%. And found that parameters all of fruits number, flowers number and yield distribution increase comparison control with 20, 36.1, 50%, respectively, while number of leaves, plant height, fruit thickness and fruit firmness same control with 4, 9.36, 25.36, 2.30% on other hand total soluble solids decrease comparison control with 13.89% for strawberry plants at frequency 20kHz second circuit -100dB - 40W and time 60sec, distance zero cm. The results showed that the emphasize specific value variations of the analyzed indicators according to the species and the experimental conditions. Ultrasonic treatment significantly influence the growth of plants and the ultrasound treatment influences positively the chlorophyll pigment synthesis the best effect being obtained when the time of exposure was short.

Key words: Biophysics methods, ultrasound, hydroponic, greenhouse, lettuce plants, strawberry plants.

DEDICATION

I dedicate this work to my parents, brothers, my spouse and my kids for all the support they lovely offered during my post-graduate studies.

ACKNOWLEDGEMENT

I wish to express my sincere thanks, deepest gratitude and appreciation to ***Dr.Gamal El-Dein Mohamed Nasr,*** *Professor of Agricultural Engineering, Faculty of Agriculture, Cairo University (Supervisor)* ***and Dr. Essam Mohamed Abd- El moaty,*** *Assiociate Professor of plant physiology, Faculty of Agriculture, Cairo University for supervision and continued assistance, and for their revision of the manuscript of this thesis and for guidance through the course of my study. Sincere thanks are also due to* ***Dr. Youssef Farag Sharobeem,*** *Head Researcher, Agriculture Engineering Research Institute Research Center (AENRI) for suggesting the problem and sharing supervision and revision.*

Grateful appreciation is also extended to all staff members of the Agriculture Engineering Department, Faculty of Agriculture, Cairo University and all staff of Agriculture Engineering Research Institute.

Special deep appreciation is given to my father, my mother, my brothers, my spouse and my kids.

LIST OF ABBREVIATIONS

Abbreviation	Meaning of abbreviation
KHz	Kilo hertz.
dB	Decibel.
SPL	Sound Pressure level.
PAFT	Plant Acoustic frequency Technology generator.
SSG	Sound Stimulation Generator.
IAA	Indole-3-acetic acid.
ABA	Abscisic acid
JA	Jasmonic acid.
ZR	Zeatin Riboside.
GA	Gibberellin.
ATP	Adenosine Tri phosphate.
ROS	Reactive Oxygen Species.
SODs	Superoxide Dismutases.
GUS	b-Glucuronidase
CK	Cytokinin
SAAT	Sonication-assisted Agrobacterium-mediated Transformation.
EC	Electrical conductivity
TSS	Total soluble solids
C	Capacitor
R	Resistor
D	Diode
T	Transistor
U	Ultrasonic microphones
K	Relay
CLAC	Central Laboratory for Agricultural Climate.
LSD	Least significant difference.
C_1	First circuit to device ultrasonic
C_2	Second circuit to device ultrasonic
UW	Ultrasonic wave
GP	Germination percentage
GS	Growth of seedling
NURC	The Nato Undersea Research Centre
DNA, RNA	Deoxyribonucleic acid, Ribonucleic acid

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LIST OF TABLES