

EVALUATION OF PRODUCING WATERMELON USING DIFFERENT SOILLESS CULTURE SYSTEMS UNDER PROTECTED CULTIVATION

Submitted By

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B.Sc. of Agricultural Sciences, Institute for Agricultural Cooperation , 2002

Diploma of Environmental Sciences, Institute of Environmental
Studies & Research Ain Shams University 2007

A thesis submitted in partial fulfillment

Of

The requirements for the Master Degree

In

Environmental Science

Department of Environmental Agricultural Science
Institute of Environmental Studies and Research
Ain Shams University

2015

APPROVAL SHEET
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تقييم انتاج البطيخ باستخدام نظم مختلفة من الزراعة بدون تربة تحت ظروف الزراعة المحمية

رسالة مقدمة من الطالبة

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**لاستكمال متطلبات الحصول على درجة الماجستير
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قسم العلوم الزراعية البيئية
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أجيزت الرسالة بتاريخ / / 2015

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2015 / /

ACKNOWLEDGEMENT

Praise and thanks to Allah, who guided and helped us to achieve this work.

I wish to express great thanks and deep gratitude to **prof. Dr. Usama Ahmed El-Behairy**, Prof. of Vegetable Crops, Faculty of Agriculture, Ain Shams University, for suggesting the current study, supervision and help during the course of this study and during preparing and reviewing of this manuscript.

Thanks are also late **prof. Dr. Zaki El-Sawy Lasheen**, Associate prof. of Vegetable Crops, Faculty of Agriculture, Ain Shams University, for their supervision during his life (Ask ALLAH to him kindness and forgive him).

I would like to thank **Dr. Mahmoud Zaky El-Attar**, Lecturer of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, for his kind supervision, advice, valuable assistance, during the preparation of this thesis.

Deepest and sincere gratitude and appreciation to Prof. Dr. **Nazmi Abdul Hamid Abdul Ghani** (Dean of the Faculty of Agriculture, Ain Shams University), for valuable assistance, moral and faithful attitude during the preparation of this manuscript.

Sincere and deep gratitude to Prof. Dr. **Hisham Ibrahim El-Qasas**, (Dean of Institute of Environmental), encouragement, and valuable helping throughout this study.

I would like to thank also extends thanks to **Dr. Abdul Rahman Al Anani**, Lecturer Field Crops production, Faculty of Agriculture, Ain Shams University. For his valuable help and Kind review as well as preparation of this manuscript.

Also wish to express his gratitude and sincere thanks to **Prof. Dr. Mohamed El_Shinawy**, Professor of Vegetable Crops, Faculty of Agriculture, Ain Shams University, for his kind help, follow up and constructive ideas and advice.

I would like to thank **Dr. Hany Gamal Metwally**, Lecturer of Vegetable Crops, Faculty of Agriculture, Ain Shams University for his encouragement, support, and valuable helping throughout this study.

My deepest sincere thanks to my son **Mostafa** for his valuable help through this study.

My grateful thanks to all staff members of Arid Land Agricultural Graduate Studies for their kind help and facilities granted during this work.

Finally, my deepest gratitude to my family for the continued assistance and encouragement through this work. This work has never been done without the way I got raised by the teacher, the guide, the kind **Dr. Ahmad Mohamed Eissa** (my husband) May ALLAH bless him on his soul and forgive him.

ABSTRACT

Experiment were carried out during two successive seasons of 2010 and 2011 under unheated plastic house, at the experimental farm, of Arid Land Agricultural Graduate Studies and Research Institute, Faculty of Agriculture, Ain Shams University, Shoubra El-Kheima, Egypt, in order to evaluate of producing watermelon using different soilless culture systems on the growth, yiald and fruit quality of two watermelon cultivars (Sakata and Q2623). Seedlings were transplanted in 20 January 2010 and 30 January 2011. The experimental treatments included four soilless culture systems: peatmoss + sand (1:1), peatmoss + perlite (1:1), peatmoss + vermiculite (1:1) and NFT system comparing with soil cultivation (control) (Sakata and Q2623) .

Treatments were arranged in a split plot design where the soilless culture systems where arranged in the main plot and the cultivars where distributed in the sub-plot with three replicates.

Regarding the cultivation systems, the obtained results indicated that the highest plant growth (plant length, number of leaves and leaf area) was obtained by using soilless culture systems. While the lowest growth was obtained using soil cultivation. The highest total yield was obtained using peatmoss + vermiculite mix and NFT system comparing the other soilless culture systems.

Concerning the fruit quality, data showed that peatmoss + vermiculite system gave the highest value of average fruit weight, TSS and flesh thickness while the lowest values were obtained by soil plantation. The highest percentage of nitrogen was obtained by peatmoss + vermiculite sestem with Sakata, while the lowest percentage in the first season was detected using soil. The highest percentage of phosphorus and potassium was obtained using peatmoss + sand mix while the lowest percentage was found in soil cultivation. On the contrary, the highest

percentage of calcium was obtained using soil while the lowest was detected using perlite mix. data showed that using NFT recorded the highest water use efficiency comparing with control in both seasons.

Regarding the cultivars, data illustrated that no significant difference were detected between the two cultivars for growth and fruit quality characters.

Regarding the interaction between the soilless culture techniques and watermelon cultivars, the highest vegetative growth and total yield recorded by vermiculite system in both seasons with both cultivar. The best interaction was detected between Q2326 cultivar with NFT in the first season and the same with Sakata in the second season.

Key words: Watermelon, Soilless Culture, Nutrient Film Technique (NFT), Substrate Culture, Perlite, Peatmoss + vermiculite culture.

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