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

Submitted By

Latifa Ahmed Ismail Attia

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
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APPROVAL SHEET

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2015

تقيم 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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صفحـة الموافقـة علـى الرسـالة

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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 caltivation. 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, Perilte, Peatmoss + vermiculite culture.

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