EFFECT OF USING GRAFTED PLANTS ON PRODUCTIVITY AND QUALITY OF SOME VEGETABLE CROPS

By

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B. Sc. Agric. Sc. (Horticulture), Ain Shams University, 2003

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ABSTRACT

Mona Ali Mohamed Ali: Effect of Using Grafted Plants on Productivity and Quality of Some Vegetable Crops. Unpublished Ph.D. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2015.

Three experiments were performed in a plastic house at Kaha Research Station, Horticulture Research Institute, Ministry of Agriculture, during the period from 2010 to 2012. This work aimed to evaluate the plant spacing, i.e. 50, 75 and 100 cm, between plants when the grafting was presented on tomato, cucumber and cantaloupe. As well as studying of the effect of grafting on the vegetative growth parameters, yield and mineral contents of grafted tomato, cucumber and cantaloupe leaves and their progeny generation ones, i.e. those obtained from progeny generation of grafted plants. As main plot, three plant spacing levels (50, 75 and 100 cm) and as submain plot, three different rootstocks were applied in split-plot design with three replicates. The results showed that there were significant differences in tomato, cucumber and cantaloupe vegetative growth parameters, yield and its component , nutrient percentage of leaves (NPK) and calculated data (net assimilation ratio, relative growth rate and leaf area ratio) due to using the rested plant spacing. Vegetative growth parameters and yield were increased by using 75 cm plant spacing. However, the lowest values were found at 100cm plant spacing. The highest values of the tested parameters were obtained with TM1003F1 rootstock in tomato and Super Shintosa in cucumber and cantaloupe .The interaction between 75 cm spacing treatment and TM1003F1 in tomato and Super Shintosa in cucumber and cantaloupe were cleared.

Key words: Graft, Rootstocks, Plant spacing, Tomato, Cucumber, Cantaloupe, Greenhouse.

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1. INTRODUCTION

Tomato, cucumber and cantaloupe produced in plastic protection and in open field as well.

Intensive cultivation with vigorous crop growth and continuous cropping inevitably leads to pest and disease problems in the soil. The accumulation of these problems may lead to a loss of yield and eventually failure of the crop. The use of methyl bromide as a main method of disinfection method is banned in many countries. However; alternatives to methyl bromide can also have adverse effects on human health and environment.

There is inevitably a trend towards some forms of soilless or soil replacement cultivation or grafting. These do not, however, remove all the problems; it simply creates a new set.

Grafting is one of the most promising techniques which can be used as an alternative to the use of methyl bromide to prevent soil infestation by vascular pests and diseases due to non-rotation cropping. Compared with soilless culture, grafting is an environmentally friendly technique and is advantageous especially if the soil is infested with vascular nematodes and fungi, and there are resistant rootstocks.

Although the possibility and benefits of using grafted plants were recognized much earlier, large-scale commercial growing of grafted vegetables can be traced from the late 1950 to the early 1960 in Japan and Korea. In cucurbitaceous crops, over 90% of watermelon seedlings are grafted onto various rootstocks and about 75% of cucumbers in both countries. In solanaceous vegetables 20-40% of tomatoes, 20-40% of eggplant and 5-10% of pepper, are grafted. Grafting practiced in cucurbits and solanaceous vegetable was about 5% in 2007 of the world production (**Lee *et al.*, 2010**). This process is now common in Asia, parts of Europe, and the Middle East.

Grafting is rare in the United States, and there have been few experiments to determine optimal grafting production practices for