

**THE INFLUENCE OF DIFFERENT GREENHOUSE  
TRANSPLANTS PRODUCTION SYSTEMS ON THE GROWTH  
AND YIELD OF SOME SOLANACYS**

**By**

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## SUMMARY

This study was suggested to investigate the effects of different substrate components with container volumes used for transplant production on pre-transplanting quality in greenhouse, and post-transplanting growth and yield in the field of tomatoes, eggplants and pepper.

Two experiments were carried out during the two seasons of 2005 and 2006, at the Experimental Station Farm of Nubaria, Agricultural Research Center.

Twenty two treatment combinations, representing all possible combination among eleven substrate mixtures i.e, 1) peatmoss + vermiculite, 2) peatmoss + sand, 3) peatmoss + rice hulls, 4) vermiculite + sand, 5) vermiculite + rice hulls, 6) sand + rice hulls, 7) peatmoss + vermiculite + sand, 8) peatmoss + vermiculite + rice hulls, 9) peatmoss + sand + rice hulls, 10) vermiculite + sand + rice hulls and 11) peatmoss + vermiculite + sand + rice hulls) , and two container volumes (22 and 35 cm<sup>3</sup> cells). The obtained results could be summarized as follows:

**Effect of substrate and container volume on quality of transplants.**

1- Plants derived from the mixtures peatmoss + vermiculite or peatmoss + sand, significantly, increased transplants growth parameters i.e leaf area, shoot height, shoot FW, shoot DW, root length, root FW and root DW for tomato, eggplant and pepper in both seasons. However, the difference between the two substrates was not significant. Also, the substrates of peatmoss + vermiculite + sand or peatmoss + vermiculite + rice hulls gave better growth.

2- Increasing container volume from 22 to 35 cm<sup>3</sup> cells, significantly, increased leaf area, shoot FW, shoot DW, root FW and root DW, in both season, and for the three crops. However, shoot highest and root length were significantly, higher with small container (22 cm<sup>3</sup>) cells.

3- The nutrient contents of transplants of three crops, generally, showed that plants grown on the mixtures of peatmoss + sand followed by peatmoss + vermiculite were pronounced and associated with the highest nutrient contents of N, P, K, Ca, Fe and Cu. Also, the big container (35 cm<sup>3</sup>) cells had higher macro and micronutrients.

4- The interaction effects of different substrates by container volumes on the most studied transplant growth were significant in both seasons. However, the same interaction effects on the most transplant nutrient content were insignificant. The best quality of transplants results were obtained as a result of growing the three crops in a mixture of peatmoss + sand or peatmoss + vermiculite combined with 35 cm<sup>3</sup> cell tray.

#### **Effect of substrates and container volumes on the field growth.**

1- Substrates composed of either peatmoss + vermiculite or peatmoss + sand, generally, produced plants, of the three studied crops, with the highest mean values of leaves number, branches number, vine length, shoot FW, shoot DW, root FW and root DW in both seasons. The difference between the two substrates were not significant. Also, the substrate of peatmoss + vermiculite + rice hulls gave better growth.

**2- Plants derived from large cell size (35 cm<sup>3</sup>) reflected a positive significant impact on some post-transplanting growth of tomato, eggplant and pepper, compared with the small cell size (22 cm<sup>3</sup>). However, the trend was not exactly the same between the three crops.**

**3- The field growth parameters reached its maximum caliber when the plants grown on 35 cm<sup>3</sup> cell size cupled with plants delivered from peatmoss + sand or peatmoss + vermiculite.**

#### **Effect of substrates and container volumes on yield**

**1- The highest yield/plant, fruit number/plant and average fruit weight of the three studied crops, were obtained from transplants grown on a mixture of peatmoss + vermiculite or peatmoss + sand, followed by peatmoss + vermiculite + sand or peatmoss + vermiculite + rice hulls. However, plants derived from peatmoss + rice hulls and vermiculite + sand were less productive.**

**2- Plants of tomato, eggplant and pepper derived from large cell size (35 cm<sup>3</sup>) reflected some significant increase on yield. Whereas, no consistent trend was noticed between the three crops.**

**3- The interaction effects of substrate mixtures and container volumes on all the studied yield characters of tomato, eggplant and pepper, except fruit number of pepper in the second season, were not significantly affected.**