Four separate experiments were carried out at the Experimental Farm of the Faculty of Agriculture, Moshtohor, Zagazig University during the two successive early summer seasons of 1993 and 1994.

Three experiments aimed to study the technology of transplanting i.e., the effect of nursery method on different plant growth characteristics of tomato, eggplant and sweet pepper, i.e., plant growth, chemical composition early and total yield.

The fourth experiment aimed to study the effect of foliar nutrition with Kristalon, sucrose or phosphoric acid on plant growth, chemical composition, flowering time, early and total yield as well as fruit quality of tomato cv. Castle Rock.

Obtained results were as follows:

5.1. First Experiment: (Effect of Transplanting Technology on Tomato):

This experiment included 6 treatments which were the combinations of two methods of sowing seeds within three tomato cultivars, cv. UC-97, Castle Rock and Peto-86. These sowing methods were: sowing seeds in polyethylene bags filled with a mixture of peat : sand : soil at 1 I : I by volume or directly in nursery beds, both grown wider polyethylene tunnels. Sowing seeds in nursery tookplace at January 15th and transplants were grown in the field at February 25th of both 1993 and 1994. A randomized block design with 4 replicates was adopted.
The results were statistically analyzed and could be summarized as follows:

5.1.1. Plant vegetative growth:
1. Sowing seeds of tomato in polyethylene bags significantly increased plant height, fresh and dry weight as well as number of branches per plant compared with growing nursery in beds (control) as a general trend for all tested tomato cultivars.
2. Tomato cv. Castle Rock surpassed the other tested cvs., UC-97-3 and Peto-86 concerning plant height, fresh and dry weight as well as number of branches per plant at 50 or 70 days after transplanting except the dry weight at 50 days after transplanting.

5.1.2. Chemical composition of plant foliage:
1. Sowing seeds of all tested tomato cultivars in polyethylene bags significantly increased N, P and - K uptake of plant foliage compared with the control (nursery beds) at 50 or 70 days after transplanting.
2. Using cv. Castle Rock either at 50 or 70 days after transplanting significantly increased total N, Rand K uptake of tomato plant foliage compared with other used cultivars.

5.1.3. Flowering time:
1. Using polyethylene bags for growing tomato seeds in nursery showed an earliness in flowering time of tomato plants, about 3 days, than beds (control).
2. Tomato cv. Peto-86 was earliest one in flowering time compared with the other used cultivars.
5.1.4. Early and fruit yield and its components:

1- Sowing seeds of tomato cv. Peto-86 in nursery in polyethylene bags significantly increased number of early fruits per plant and early fruit yield as ton/fad. as compared with the other tested treatments. Results concerning the early yield per plant indicated that cvs. Castle Rock or Peto-86 showed the best results in yield earliness per plant as compared with the control (cvs. within beds).

2- Using polyethylene bags significantly increased fruit, early yield by number and weight per plant or per faddan as compared with the control (beds). This increment in early fruit yield per faddan of tomato cvs. raised from bags ranged from 62.7 and 99.8% during 1993 and 1994, respectively.

5.1.5. Total fruit yield and its components:

1- Sowing seeds of tomato cv. Castle Rock in polyethylene bags significantly increased average fruit weight and total fruit yield per plant or faddan compared with the control. Meanwhile, the number of fruits was significantly increased when seeds of cv. Peto-86 were sown in polyethylene bags.

2- Using polyethylene bags significantly increased average fruit weight, total number of fruits per plant, total yield per plant and per faddan as compared with beds (control). This increment in total yield as ton/fad. of tomato cvs. ranged from 33.5 and 31.4% during 1993 and 1994, respectively.

3- Average fruit weight, total yield per plant and per faddan significantly increased with using Castle Rock cultivar, meanwhile, cv. Peto-86 gave best results with the number of fruits per plant.
5.1.6. Fruit quality:

1. Sowing seeds of tomato nursery in polyethylene bags significantly increased fruit quality expressed as TSS%, reducing, non-reducing and total sugars content as compared with that of the control (beds). Fruit juice acidity showed a contra trend, however, vitamin-C was not significantly differed due to the technology of nursery. These results were true for the interaction between cultivars X methods of nursery.

2. Concerning with cultivars cv. UC-97 surpassed the other tested cultivars with respect to total sugars and its fractions; vitamin-C juice acidity. However, cvs. Peto-86 and Castle Rock were the highest in TSS%.

5.2. Second Experiment: (Effect of Transplanting Technology on Eggplant):

This experiment included 4 treatments which are two methods of sowing seeds in the nursery within two cultivars of eggplant cv. Black Beauty and White Balady. These sowing methods were; sowing seeds in polyethylene bags or directly in field beds both under polyethylene tunnels. Sowing in nursery tookplace at December 25th. of 1992 & 1993 and transplants were grown in the field at February 25th of 1993 & 1994. A complete randomized block design was adopted using 4 blocks. to get the fruit yield. Results obtained were:

5.2.1. Plant vegetative growth:

Sowing seeds of eggplant cvs. Black Beauty or White Balady in polyethylene bags significantly increased plant height. Meanwhile, cv. Black Beauty gave best results with the fresh and dry weight at 65 or
80 days after transplanting i.e., at flowering and fruit setting stages respectively, compared with the control (cvs. within beds).

2. Using polyethylene bags significantly increased plant height, fresh and dry weight compared with the control (beds).

3. Using two eggplant cultivars, i.e., Black Beauty and White Balady did not show any significant response concerning plant height, fresh and dry weight at 65 or 80 days after transplanting.

5.2.2. Chemical composition of plant foliage:

1. Sowing seeds of eggplant cv. Black Beauty in polyethylene bags significantly increased N, P and K content compared with the control (cvs. within beds).

2. Using polyethylene bags significantly increased N, P and K content of eggplant foliage at 65 or 80 days after transplanting.

3. cv. Black Beauty significantly surpassed cv. White Balady concerning with total N, P and K content of eggplant foliage at 65 or 80 days after transplanting.

5.2.3. Early and Total fruit yield and its components:

1. Sowing seeds of eggplant cv. White Balady in polyethylene bags significantly increased number of early fruits, early yield per plant and per faddan compared with the control (cv. within beds).

2. Using polyethylene bags did not show any significant response concerning number of early fruits, early yield per plant and per faddan as compared with beds.

3. Using White Balady cultivar significantly increased number of early fruits, early yield per plant and per faddan compared with the other used cultivar. The increment in early yield were (57.5 and 47.9%) with
cv. Black Beauty and (19.3 and 18.9%) with cv. White Balady in polyethylene bags compared with beds during 1993 and 1994, respectively.

4- Sowing seeds of eggplant cv. Black Beauty in polyethylene bags significantly increased average fruit weight and total yield per plant and per faddan than that of beds. The increment total fruit yield was (20.7 and 19.7%) with cv. Black Beauty and (5.6 and 9.8%) with cv. White Balady during the first and the second experimental season respectively. Meanwhile, the number of fruits was significantly increased when nursery seeds of cv. White Balady were grown in polyethylene bags as compared with the control.

5. Regardless to cultivars, using polyethylene bags did not show any significant response concerning average fruit weight, number of fruits, total fruit yield per plant and per faddan.

6- Using Black Beauty cultivar significantly increased average fruit weight, total fruit yield per plant and per faddan as compared with White Balady. Meanwhile, total number of fruits per plant was higher of White Balady.

5.3. **Third Experiment:** (Effect of Transplanting Technology on Sweet Pepper:

This experiment included 2 treatments which are two methods of sowing seeds within one cultivar of sweet pepper cv. California Wander.

The sowing methods were: sowing seeds in polyethylene bags or directly in nursery beds both under polyethylene tunnel, sowing in nursery took place at December 25th of 1992 and 1993 seasons and transplants were grown in the open field at February 25th of 1993 and 1994 seasons.
A randomized block design with 4 blocks was adopted. Obtained results were as follows:

5.3.1. Plant vegetative growth:

Sowing seeds of sweet pepper cv. California Wander in polyethylene bags significantly increased plant height, fresh and dry weight as well as number of branches as compared with the control (beds).

5.3.2. Chemical composition of plant foliage:

Sowing seeds of sweet pepper cv. California Wander significantly increased total N, P and K content of plant foliage compared with the control (beds).

5.3.3. Early and total fruit yield and its components:

Using polyethylene bags in nursery significantly increased early number of fruits, early yield per plant and per faddan. The increment in early fruit yield per faddan were 36.8 and 40.0% during 1993 and 1994, respectively. Also, such treatment had a promising effect on increasing average fruit weight, total number of fruits, total fruit yield per plant and per faddan compared with the control (beds). Whereas, the increment in total fruit yield was 41.5 and 36.4% during the first and the second season, respectively.

5.3.4. Fruit quality:

Sowing seeds of sweet pepper cv. California Wander in polyethylene bags significantly increased vitamin-C, titratable acidity, reducing sugars and total sugars in the second season season only.
Meanwhile, nursery method did not show any significant response concerning TSS and non reducing sugars.

5.4. **Fourth Experiment: (Effect of Foliar Nutrition on Tomato)**

This experiment included 7 treatments, which are Kristalon (0.2 or 0.4%), sucrose (1 or 2%) or phosphoric acid (0.25 or 0.50%) in addition to the control treatment. Spraying was done at 3, 5, 7 weeks after transplanting. Obtained data could be summarized as follows:

5.4.1. Plant vegetative growth:

1. Spraying tomato plants with Kristalon or sucrose or phosphoric acid promoted tomato vegetative growth expressed as plant height, fresh and dry weight per plant compared with control treatment in both seasons. The most favourable treatments on plant height was Kristalon at 0.2%, sucrose at 1% or phosphoric acid at 0.50% after 60 days from transplanting.

2. Most of Kristalon or sucrose or phosphoric acid used treatments significantly increased fresh weight per plant than the control one. Treatments which showed highest values in this respect were Kristalon at 0.2% or sucrose at 2% at 60 days after transplanting but, at 80 days after transplanting the best treatments in this respect was Kristalon at 0.2 or 0.4% or phosphoric acid at 0.50%.

3. Concerning the dry weight per plant, it was evident, that tomato plants sprayed with any of the used Kristalon or sucrose or phosphoric acid did not significantly increase the dry weight at 60 days after transplanting. On the other hand, at 80 days after transplanting, the used Kristalon at 0.4% or phosphoric acid at 0.50% significantly increased dry weight per plant compared the unsprayed plants.
5.4.2. Chemical composition of plant foliage:
Spraying tomato plants with either two used concentrations of Kristalon or sucrose significantly increased N content. So that used two concentrations of Kristalon or phosphoric acid increased P uptake compared with the control. Also spraying tomato plants with any of the used Kristalon or sucrose or phosphoric acid significantly increased K uptake as compared with the control.

5.4.3. Flowering time:
Regarding flowering time expressed as number of days from transplanting to the anthesis of the first flower, it is evident that spraying tomato plains with phosphoric acid at 0.50% significantly accelerated flowering time during both seasons of growth.

5.4.4. Early and total yield and its components:
1- Number of early fruits per plant was significantly increased in treatments received Kristalon 0.2, 0.4% or phosphoric acid 0.50% than the control during both seasons of growth. It is also evident that all used treatments except sucrose 1% increased number of early fruits per plant especially in the second season as compared with the control treatment. Concerning early yield per plant, it was significantly increased in treatments received sucrose 1, 2% or phosphoric acid at 0.50% but fruit early yield per fad. was significantly increased in treatments received sucrose 2% or phosphoric acid at 0.50% as compared with the control.
3- Number of fruits and total yield per plant were significantly increased by all treatments except used sucrose at 1%. But all treatments significantly increased total fruit yield per faddan during both seasons of growth.
5.4.5. Fruit quality:

1- Average fruit weight was increased as a result of using all treatments except phosphoric acid at 0.25%.

2- Treatment showed the highest values in fruit length was the use of Kristalon at 0.4% especially in the second season of growth.

3- Chemical constituents of tomato fruit such as total soluble solids was significantly improved in fruits of treated plants with Kristalon at 0.4%, sucrose at 1% or phosphoric acid at 0.50% but vitamin-C was significantly increased by $1\cdot10^{-1}\text{PO}_4$ at 0.25%. Concerning titratable acidity, phosphoric acid at 0.50% was significantly increased in the second season only. Reducing, non-reducing and total sugars were significantly increased as plants were sprayed with sucrose at 1 or 2%.

CONCLUSION

1. As for the technology of transplanting of solanceous crops:

Results showed that growing nurseries of tomato, eggplant and sweet pepper at late December under low polyethylene tunnel in a black polyethylene bags 8x 15 cm filled with a mixture of peatmoss sand soil at 1:1 by volume is recommended to get transplants ready for growing with soil balls in the open field in the early summer season. This treatment increased early yield production as ton/fad. by 62.7-99.8% as an average of the three studied tomato cultivars, 47.9-57.5% for eggplant cv. "Black Beauty", 19.3-18.9% for cv. White Balady, 36.8-40.0% for sweet pepper cv. "California Wander" as compared with the early yield of transplants grown under polyethylene tunnel in normal nursery beds.

Concerning tomato cultivars, cv. Peto-86 was the earliest one followed by Castle Rock and UC-97-3 in descending order.
Generally tomato cv. Castle Rock and eggplant cv. Black Beauty may be recommended for the highest total yield with the average fruit weight as compared with the other tested cultivars of each crop.

2. As for foliar nutrition treatments of tomato:

Spraying tomato plants cv. Castle Rock three times at 3, 5 and 7 weeks after transplanting with phosphoric acid at 0.50% or sucrose at 2% may be recommended for the highest early and total fruit yield of tomato as well as best fruit quality.