ISSN 1110-0419

*Annals Of Agric. Sc., Moshtohor,*
*Vol. 44(4): 1741-1750, (2006).*

# EFFECT OF CALCIUM AND POTASSIUM FOLIAR APPLICATION ON POSTHARVEST PEACH FRUIT QUALITY. I- EFFECT OF LEAF AND FRUIT MINERAL CONTENT, FRUIT QUALITY AND YIELD.

BY

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## ABSTRACT

The effect of spraying Flordaprince and Desert Red Peach trees. With Calcium nitrate (19.4% Ca), Calcium-EDTA (12% Ca), Potassium sulphate (51% $K_2O$), Potassium green (35% $K_2O$) at 0.5, 0.75 and 1.0%. on leaf, fruit mineral content, fruit weight and yield during 1999 and 2000 seasons. Three foliar sprays were carried out to trees from each treatment as follows: -The first spray was just at pit-harding, The second was after two weeks from the first one, and the third was after two weeks from the second spray. Data showed that calc um treatments increased leaves Ca contents than potassium and control treatment. Whereas, calcium nitrate and potassium green at 1.0% showed the highest values. Meanwhile, K and Ca contents in the leaves of cv. Desert Red where is higher than those in cv. Flordaprince. However, potassium green at 1.0% increased the yield of peach trees and improved fruit quality .

## INTRODUCTION

Peach (*Prunus persica* L. Batsch) is considered one of the most important fruits in the world. It ranks second to the apple among temperate zone deciduous fruit trees from the standpoint of production and value (Childer, 1978).

Calcium level plays an important role in fruit quality, it maintains cell wall structure, retains fruit firmness, delays ripening and senescence, and helps in reducing susceptibility to fruit physical damage. Meanwhile, Potassium is a major nutrient that needs to be supplied in relatively large quantities to crop plants in general and to fruit trees in particular, it is the most abundant cation in the cytoplasm, it has an important role in pH stabilization, osmoregulation, enzyme activation, protein synthesis and photosynthesis, and cell extension (Faust, 1989).

The aim of this investigation is to evaluate the effect of calcium and potassium foliar applications on leaf and fruit mineral content, fruit quality and yield.

## MATERIALS AND METHODS

This investigation was carried out at Egypt-Alexandria desert road KL 86. during seasons of 1999 and 2000. Healthy and nearly uniform peach trees of

six years old budded on Nemagard rootstock and growing in sandy loamy soil at 4.0 x 5.0 meters apart. Trees received normal horticultural practices including: drip irrigation, fertilization, pruning, fruit thinning as well as pest and disease control before starting this study.

The following treatments were used:

1- Control (sprayed with water only).
2- Calcium nitrate (19.4% Ca) at 0.5, 0.75 and 1.0%.
3- Calcium-EDTA* (12% Ca) at 0.5, 0.75 and 1.0%.
4- Potassium sulphate (51% $K_2O$) at 0.5, 0.75 and 1.0%.
5- Potassium green** (35% $K_2O$) at 0.5, 0.75 and 1.0%.

Three foliar sprays were carried out to trees from each treatment as follows: -

1- The first spray was Just at Pit-harding which was at 57 and 64 days from full bloom for cvs. Flordaprince and Desert Red, respectively.
2- The second spray was after two weeks from the first one.
3- The third was after two weeks from the second spray.

At harvest; (maturity stage) was determined according to parameters recommended by Shaltout, (1987 & 1995) on Flordaprince and Desert Red peach cultivars, respectively.

**Measurements and Determinations:-**

**1- Leaf and fruit mineral content.**

Reprehensive samples from the leaves of mid-shoots were collected from each replicate. Both leaf and fruit samples were carefully taken out, washed with tap water followed by distilled water several times. The samples were oven dried at 70°C until constant weight and grounded in stainless steel rotary mill, 0.2 g of this dried samples was used for preparing the wet digestion procedure by using sulphoric acid and hydrogen peroxide ($H_2O_2$) as described by Evenhuis and Dewaard (1980). The digested solution was kept in brown bottles until the determination of potassium and calcium.

**Potassium determination:**

The wet digested samples were used for potassium determination using flame photometer according to Brown and Lillcand (1946).Calcium determination:

Calcium was determined using Atomic absorption spectrophotometer according to the method described by Piper (1958). The K and Ca values were reported on a dry-weight basis.

2-Yield: the yield was determined as Kg/tree.
3-Average fruit weight (g)
4-Flesh weight percentage

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* Ca-EDTA (12% Ca, in the form of calcium ethylen diamine tetra acetate).

** Potassium green : 35% $K_2O$ from 80% (Citrate + Acatate + Tartarate) + 20% phosphate + trace (Ascorbic acid + Calcilic acid).

$$\frac{\text{Fruit weight} - \text{seed weight}}{\text{Fruit weight}} \times 100$$

**Statistical analysis:**

Randomized complete block design was used to analysis the present data according to Steel and Torrie (1980). Means for treatment were compared by the least significant difference test (L.S.D) at the 5% level of probability in the two seasons of the experiment.

## RESULTS AND DISCUSSIONS

**1- Leaves:**

It is clear from Table (1) that calcium treatments increased the calcium content of the leaves during both seasons of study in both cultivars than potassium treatments or control. However; Ca contents in the leaves is higher in cv. Desert Red than those in cv. Flordaprince. Meanwhile, calcium nitrate at 1% showed the highest values than other potassium or calcium and control treatments for cv. Desert Red and cv. Flordaprince in both seasons. Furthermore Table (2) disclosed that, potassium green treatment at 1.0% showed higher values potassium content in the leaves than other potassium or calcium and control treatments of both peach cultivars in the two seasons.

**Table (1): Effect of different concentrations of calcium and potassium spray treatments on calcium mineral contents (% D.W.) of Flordaprince and Desert Red peach leaves.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 1.52 | 1.52 | 1.52 | 1.52 | 1.43 | 1.43 | 1.43 | 1.43 |
| Calcium nitrate | 1.73 | 2.31 | 2.74 | 2.26 | 1.62 | 2.15 | 2.54 | 2.10 |
| Calcium EDTA | 1.69 | 2.15 | 2.57 | 2.14 | 1.57 | 1.98 | 2.46 | 2.00 |
| Potassium sulphate | 1.56 | 1.61 | 1.66 | 1.61 | 1.50 | 1.57 | 1.62 | 1.56 |
| Potassium green | 1.63 | 1.75 | 1.83 | 1.74 | 1.57 | 1.64 | 1.76 | 1.66 |
| Mean | 1.63 | 1.87 | 2.05 | | 1.54 | 1.75 | 1.96 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.13 | | | | 0.1 | | | |
| Ele (B) | 0.21 | | | | 0.14 | | | |
| A x B | 0.26 | | | | 0.19 | | | |
| | Desert Red | | | | | | | |
| Control | 1.82 | 1.82 | 1.82 | 1.82 | 1.76 | 1.76 | 1.76 | 1.76 |
| Calcium nitrate | 2.15 | 2.36 | 2.84 | 2.45 | 1.94 | 2.24 | 2.63 | 2.27 |
| Calcium EDTA | 2.01 | 2.15 | 2.54 | 2.23 | 1.91 | 2.13 | 2.51 | 2.18 |
| Potassium sulphate | 1.87 | 1.93 | 1.97 | 1.92 | 1.75 | 1.82 | 1.89 | 1.82 |
| Potassium green | 1.93 | 2.13 | 2.17 | 2.08 | 1.82 | 2.00 | 2.06 | 1.96 |
| Mean | 1.96 | 2.08 | 2.27 | | 1.84 | 1.99 | 2.17 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.11 | | | | 0.1 | | | |
| Ele (B) | 0.17 | | | | 0.16 | | | |
| A x B | 0.22 | | | | 0.23 | | | |

**Table (2): Effect of different concentrations of calcium and potassium spray treatments on potassium mineral contents (% D.W.) of Flordaprince and Desert Red peach leaves.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 1.35 | 1.35 | 1.35 | 1.35 | 1.39 | 1.39 | 1.39 | 1.39 |
| Calcium nitrate | 1.41 | 1.52 | 1.52 | 1.48 | 1.46 | 1.57 | 1.59 | 1.54 |
| Calcium EDTA | 1.37 | 1.45 | 1.52 | 1.45 | 1.39 | 1.42 | 1.42 | 1.47 |
| Potassium sulphate | 1.54 | 1.63 | 1.72 | 1.63 | 1.57 | 1.66 | 1.75 | 1.66 |
| Potassium green | 1.64 | 1.75 | 1.91 | 1.77 | 1.71 | 1.79 | 1.94 | 1.81 |
| Mean | 1.46 | 1.54 | 1.60 | | 1.50 | 1.57 | 1.63 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 011 | | | | 0.08 | | | |
| Ele (B) | 0.14 | | | | 0.17 | | | |
| A x B | 0.21 | | | | 0.24 | | | |
| | Desert Red | | | | | | | |
| Control | 1.54 | 1.54 | 1.54 | 1.54 | 1.63 | 1.63 | 1.63 | 1.63 |
| Calcium nitrate | 1.57 | 1.59 | 1.64 | 1.60 | 1.62 | 1.65 | 1.67 | 1.65 |
| Calcium EDTA | 1.55 | 1.61 | 1.62 | 1.59 | 1.63 | 1.65 | 1.69 | 1.66 |
| Potassium sulphate | 1.64 | 1.72 | 1.91 | 1.76 | 1.72 | 1.85 | 1.97 | 1.85 |
| Potassium green | 1.72 | 1.95 | 2.10 | 1.92 | 1.82 | 2.12 | 2.32 | 2.09 |
| Mean | 1.60 | 1.68 | 176 | | 1.68 | 1.78 | 1.86 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.13 | | | | 0.12 | | | |
| Ele (B) | 0.15 | | | | 0.22 | | | |
| A x B | 0.19 | | | | 0.25 | | | |

However, K contents in the leaves is higher in cv. Desert Red than cv. Flordaprince.

Generally, it is notice that calcium treatments increased leaves Ca contents than potassium and control treatments. Whereas, calcium nitrate and potassium green at 1.0% showed the highest values. Meanwhile, K and Ca contents in the leaves of cv. Desert Red where higher than those in cv. Flordaprince.

These results are in agreement with the findings of, Dris (1998) on apple, Budde *et al* (1997) on peach, and Raese and Dark (2000) on pear, and as they observed that, Ca treatments were effective in increasing Ca leaves concentration. On the other hand, Rufato *et al.* (1999) sprayed peach trees with Agrosixa (16 % N, 4 % $K_2O$, 0.01 % Mg, 0.3 % S, 0.02 % B, 0.01 % Mn and 0.01 % Ca) they found that, Ca levels were lower in treated trees than in untreated ones.

**2- Fruits:**

It is clear from Table (3 and 4) that. Ca content in the fruit is higher in the first season than those in the second one .On the other hand, the referse was true in K content in both cultivars .Meanwhile Ca and K contents were higher in cv. Desert Red fruits than in cv. Flordaprince fruits. Moreover calcium nitrate treatment at 1.0% gave higher values than the other used treatments for two cultivars in both seasons.

**Table (3): Effect of different concentrations of calcium and potassium spray treatments on calcium mineral contents (% D.W.) of Flordaprince and Desert Red peach fruits.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 0.017 | 0.017 | 0.017 | 0.017 | 0.015 | 0.015 | 0.015 | 0.015 |
| Calcium nitrate | 0.022 | 0.026 | 0.031 | 0.026 | 0.019 | 0.023 | 0.027 | 0.023 |
| Calcium EDTA | 0.019 | 0.024 | 0.027 | 0.023 | 0.017 | 0.020 | 0.024 | 0.020 |
| Potassium sulphate | 0.018 | 0.020 | 0.023 | 0.020 | 0.015 | 0.017 | 0.018 | 0.017 |
| Potassium green | 0.018 | 0.021 | 0.023 | 0.021 | 0.016 | 0.018 | 0.019 | 0.018 |
| Mean | 0.019 | 0.022 | 0.024 | | 0.016 | 0.019 | 0.021 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.002 | | | | 0.003 | | | |
| Ele (B) | 0.003 | | | | 0.004 | | | |
| A x B | 0..005 | | | | 0.005 | | | |
| | Desert Red | | | | | | | |
| Control | 0.022 | 0.022 | 0.022 | 0.022 | 0.019 | 0.019 | 0.019 | 0.019 |
| Calcium nitrate | 0.024 | 0.029 | 0.033 | 0.029 | 0.021 | 0.025 | 0.031 | 0.026 |
| Calcium EDTA | 0.023 | 0.025 | 0.029 | 0.026 | 0.020 | 0.023 | 0.027 | 0.023 |
| Potassium sulphate | 0.022 | 0.024 | 0.025 | 0.024 | 0.019 | 0.021 | 0.023 | 0.021 |
| Potassium green | 0.021 | 0.025 | 0.025 | 0.024 | 0.020 | 0.022 | 0.024 | 0.022 |
| Mean | 0.022 | 0.025 | 0.027 | | 0.02 | 0.022 | 0.025 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.002 | | | | 0.003 | | | |
| Ele (B) | 0.002 | | | | 0.004 | | | |
| A x B | 0.004 | | | | 0.006 | | | |

Concerning the effect of treatments on fruits K content, the results indicate that potassium green treatment at 1.0% gave higher values in both cv. Desert Red and cv. Florduprince fruits than other treatments.

Generally, potassium treatments increased leaves and fruits k content than calcium and control treatments, which resulted in improving fruit quality at harvest and during storage; owing to its positive effect. Meanwhile, calcium treatments increased fruits Ca contents than potassium and control treatments.

These results partially agreed with the findings of Johnson (1998) and Hudina and Stampar (2002) on pear. They observed that potassium fertilizer increased K leaves and fruits contents. On the other hand, these results disagreed with Carlos *et al* (2000). They mentioned that, Multiple commercial calcium foliar sprays to peach and nectarine cultivars did not affect fruit flesh Calcium concentration at harvest.

**2-Yield:**

It is clear from Table (5) that, calcium treatments increased the yield of peach trees than untreated ones. As application of calcium nitrate at 1.0% gave higher yield for cv. Desert Red as compared with cv. Flordaprince in both seasons.

**Table (4): Effect of different concentrations of calcium and potassium spray treatments on potassium mineral contents (% D.W.) of Flordaprince and Desert Red peach fruits.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 0.64 | 0.64 | 0.64 | 0.64 | 0.69 | 0.69 | 0.69 | 0.69 |
| Calcium nitrate | 0.66 | 0.69 | 0.69 | 0.68 | 0.71 | 0.75 | 0.75 | 0.74 |
| Calcium EDTA | 0.62 | 0.67 | 0.67 | 0.65 | 0.71 | 0.73 | 0.75 | 0.73 |
| Potassium sulphate | 0.66 | 0.69 | 0.72 | 0.69 | 0.72 | 0.75 | 0.79 | 0.75 |
| Potassium green | 0.74 | 0.79 | 0.82 | 0.78 | 0.75 | 0.81 | 0.86 | 0.81 |
| Mean | 0.66 | 0.70 | 0.71 | | 0.72 | 0.75 | 0.77 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.02 | | | | 0.03 | | | |
| Ele (B) | 0.06 | | | | 0.04 | | | |
| A x B | 0.08 | | | | 0.07 | | | |
| | Desert Red | | | | | | | |
| Control | 0.71 | 0.71 | 0.71 | 0.71 | 0.73 | 0.73 | 0.73 | 0.73 |
| Calcium nitrate | 0.71 | 0.74 | 0.76 | 0.74 | 0.75 | 0.77 | 0.77 | 0.76 |
| Calcium EDTA | 0.68 | 0.72 | 0.74 | 0.71 | 0.73 | 0.75 | 0.75 | 0.74 |
| Potassium sulphate | 0.74 | 0.78 | 0.81 | 0.78 | 0.77 | 0.82 | 0.85 | 0.81 |
| Potassium green | 0.78 | 0.84 | 0.87 | 0.83 | 0.81 | 0.86 | 0.89 | 0.85 |
| Mean | 0.72 | 0.76 | 0.78 | | 0.76 | 0.79 | 0.80 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.02 | | | | 0.01 | | | |
| Ele (B) | 0.05 | | | | 0.03 | | | |
| A x B | 0.07 | | | | 0.05 | | | |

However, potassium treatments increased the yield of peach than control, especially potassium green at 1.0% as it recorded 54.0 & 56.0 Kg/tree for cv. Desert Red and 42.6 & 45.2 Kg/tree for cv. Flordaprince in the first and second seasons, respectively. From the above data it can be observed that, potassium treatments showed higher effect on peach yield than calcium treatments.

The above results are in harmony with the findings of Ashour (2000) and Heweihua *et al* (1998) on apple. They mentioned that, calcium treatments increased the yield. On the other hand these results disagreed with Johnson and Dover (2002) findings. They stated that, early sprays of calcium to apple trees reduced fruit yield at harvest. On the contrary, Policarpo *et al* (2002) on peach, and Bussi *et al* (2003) on Apricot, mentioned that, no significant difference was observed with potassium treatments on yield.

**3- Fruit weight:**

It is clear from Table (6) that, calcium nitrate treatment at 1.0% increased peach fruit weight than control and calcium- EDTA, which gave 88.4 & 91.6g for cv. Desert Red and 79.4 & 81.4g for cv. Flordaprince in the first and second seasons, respectively. Meanwhile, application of potassium green at 1.0% treatment showed higher fruit weight values as it recorded 92.3 & 93.4 g for cv Desert Red and 81.3 & 83.7g for cv., Flordaprince in both seasons, respectively

**Table (5): Effect of different concentrations of calcium and potassium spray treatments on yield (kg/tree) of Flordaprince and Desert Red peaches.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 35.4 | 35.4 | 35.4 | 35.4 | 36.5 | 35.5 | 35.5 | 35.5 |
| Calcium nitrate | 35.9 | 37.4 | 40.3 | 37.9 | 36.7 | 37.2 | 40.5 | 38.1 |
| Calcium EDTA | 36.3 | 36.8 | 38.3 | 37.1 | 35.4 | 37.6 | 39.2 | 37.4 |
| Potassium sulphate | 37.2 | 38.4 | 39.5 | 38.4 | 37.7 | 39.2 | 40.5 | 39.1 |
| Potassium green | 39.4 | 40.2 | 42.6 | 40.7 | 40.5 | 42.3 | 45.2 | 42.6 |
| Mean | 36.8 | 37.6 | 39.2 | | 37.4 | 38.6 | 40.4 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 1.3 | | | | 1.1 | | | |
| Ele (B) | 1.6 | | | | 1.7 | | | |
| A x B | 2.3 | | | | 2.1 | | | |
| | Desert Red | | | | | | | |
| Control | 44.5 | 44.5 | 44.5 | 44.5 | 46.0 | 46.0 | 46.0 | 46.0 |
| Calcium nitrate | 45.3 | 48.2 | 49.5 | 47.6 | 47.0 | 49.5 | 51.6 | 49.4 |
| Calcium EDTA | 44.0 | 46.5 | 48.0 | 46.2 | 45.0 | 47.0 | 50.0 | 47.3 |
| Potassium sulphate | 46.5 | 49.0 | 51.0 | 48.8 | 48.0 | 51.0 | 53.5 | 50.8 |
| Potassium green | 48.5 | 52.0 | 54.0 | 51.3 | 48.0 | 53.0 | 56.0 | 52.3 |
| Mean | 45.8 | 48.0 | 49.4 | | 46.8 | 49.3 | 51.4 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.9 | | | | 1.3 | | | |
| Ele (B) | 1.4 | | | | 2.1 | | | |
| A x B | 2.3 | | | | 2.9 | | | |

**Table (6): Effect of different concentrations of calcium and potassium spray treatments on average fruit weight (g) of Flordaprince and Desert Red peaches.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 71.5 | 71.5 | 71.5 | 71.5 | 73.6 | 73.6 | 73.6 | 73.6 |
| Calcium nitrate | 72.6 | 76.2 | 79.4 | 76.1 | 73.8 | 79.6 | 81.4 | 78.3 |
| Calcium EDTA | 72.0 | 75.4 | 78.0 | 75.1 | 74.5 | 78.9 | 79.7 | 78.0 |
| Potassium sulphate | 73.4 | 76.7 | 78.8 | 76.3 | 76.4 | 79.2 | 81.6 | 79.1 |
| Potassium green | 74.2 | 77.6 | 81.3 | 77.7 | 76.9 | 80.1 | 83.7 | 80.2 |
| Mean | 72.7 | 75.5 | 77.8 | | 75.0 | 78.3 | 80.0 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 1.9 | | | | 1.4 | | | |
| Ele (B) | 2.1 | | | | 1.8 | | | |
| A x B | 2.5 | | | | 2.2 | | | |
| | Desert Red | | | | | | | |
| Control | 79.3 | 79.3 | 79.3 | 79.3 | 81.5 | 81.5 | 81.5 | 81.5 |
| Calcium nitrate | 81.3 | 86.5 | 88.4 | 85.4 | 84.2 | 87.4 | 91.6 | 87.7 |
| Calcium EDTA | 81.0 | 84.3 | 86.5 | 83.9 | 82.5 | 85.6 | 87.3 | 85.1 |
| Potassium sulphate | 82.3 | 86.4 | 89.7 | 86.1 | 83.4 | 87.6 | 90.1 | 87.0 |
| Potassium green | 84.6 | 87.4 | 92.3 | 88.1 | 84.8 | 89.2 | 93.4 | 89.1 |
| Mean | 81.7 | 84.8 | 87.2 | | 83.3 | 86.3 | 88.8 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 2.1 | | | | 1.6 | | | |
| Ele (B) | 2.6 | | | | 2.2 | | | |
| A x B | 2.9 | | | | 2.8 | | | |

Generally, the aforementioned results conclude that, potassium treatments increased fruit weight than control or calcium treatments. The positive effect of potassium fertilization on fruit weight may be due to the physiological role of potassium on fruit trees, as it encouraged expanding cells, and the growth is very sensitive to $K^+$ deficiency. Cell extension involves the formation of a large central vacuole that especially in the fruit can occupy 90% or more of the cell volume. It is well established that cells extension is the consequence of the accumulation of $K^+$ in the cells and in the vacuole (Marschner, 1986). These results are in coordination with the findings of Plich and Wojcik (2002) on plum and Robson *et al.* (1989) on peach. They found that, calcium treatments increased fruit weight and size than control. On the other hand, Policarpo *et al* (2002) on peach and Bussi *et al* (2003) on apricot. They mentioned that, potassium fertilizer has no significant effect on fruit weight.

**4- Flesh weight percentage:**

Data in Table (7) showed the significant effect of calcium and potassium treatments on flesh weight percentage of peach fruits. Meanwhile, the flesh weight percentage was higher in peach fruits treated with calcium nitrate at 1.0% than control or other calcium treatments. However, potassium treatments showed high flesh weight percentage than calcium or control treatments. The above results confirm the positive effect of potassium in improving the quality of the fruit.

These results are similar to those of Dhillon and Bal (1990) on plum and Nageib *et al* (1991) on Apricot. They recorded that potassium treatments had a greater influence on flesh weight percentage of fruits.

**Table (7): Effect of different concentrations of calcium and potassium spray treatments flesh weight percentage of Flordaprince and Desert Red peaches.**

| Concentrations / Treatments | Flordaprince | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1999 | | | | 2000 | | | |
| | 0.5 | 0.75 | 1.0 | M | 0.5 | 0.75 | 1.0 | M |
| Control | 92.3 | 92.3 | 92.3 | 92.3 | 92.5 | 92.5 | 92.5 | 92.5 |
| Calcium nitrate | 92.6 | 92.8 | 93.3 | 92.2 | 92.9 | 92.7 | 92.8 | 93.6 |
| Calcium EDTA | 92.4 | 92.8 | 93.0 | 92.7 | 92.6 | 92.9 | 93.2 | 92.9 |
| Potassium sulphate | 92.8 | 93.5 | 93.7 | 93.3 | 93.0 | 93.7 | 93.8 | 93.5 |
| Potassium green | 92.8 | 93.7 | 93.9 | 93.5 | 93.0 | 93.9 | 94.1 | 93.7 |
| Mean | 92.6 | 93.0 | 93.2 | | 92.8 | 93.2 | 93.4 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.2 | | | | 0.3 | | | |
| Ele (B) | 0.5 | | | | 0.6 | | | |
| A x B | 0.8 | | | | 0.8 | | | |
| | Desert Red | | | | | | | |
| Control | 91.1 | 91.1 | 91.1 | 91.1 | 91.4 | 91.4 | 91.4 | 91.4 |
| Calcium nitrate | 93.0 | 91.3 | 91.9 | 92.3 | 91.8 | 91.6 | 92.4 | 92.7 |
| Calcium EDTA | 91.2 | 91.6 | 91.9 | 91.6 | 91.6 | 91.9 | 92.3 | 91.9 |
| Potassium sulphate | 91.6 | 92.2 | 92.6 | 92.1 | 91.9 | 92.5 | 93.0 | 92.5 |
| Potassium green | 91.7 | 92.5 | 92.9 | 92.7 | 91.9 | 92.7 | 93.2 | 92.6 |
| Mean | 91.4 | 91.9 | 92.2 | | 91.7 | 92.2 | 92.5 | |
| LSD 0.05 | | | | | | | | |
| Con (A) | 0.3 | | | | 0.2 | | | |
| Ele (B) | 0.5 | | | | 0.6 | | | |
| A x B | 0.7 | | | | 0.9 | | | |

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## تأثير رش الكالسيوم والبوتاسيوم على جودة تداول ثمار الخوخ
## ١- تأثيرها على محتوى العناصر فى الأوراق و الثمار وجودة الثمار والمحصول

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أجريت دراسة تأثير رش أشجار أصناف الخوخ فلوريدا برنس وديـزرت رد بنترات الكالسـيوم (١٩,٤ % Ca)، بالكالسـيوم المخلبـي (١٢,٠ % Ca)، بسـلفات البوتاسيوم (٥١ % $K_2O$)، بالبوتاسيوم جرين (٣٥ % $K_2O$) بتركيزات ٠,٥ – ٠,٧٥ – ١% وتأثيرها على محتوى العناصر فى الأوراق و الثمار ووزن الثمـار والمحصـول خلال موسمى (١٩٩٩-٢٠٠٠م). وذلك برش أشجار كل معاملة ثلاثة رشات كما يلي: أول رشة بعد مرحلة تصلب النواة مباشرة و الرشة الثانية كانت بعد الأولى بأسبوعين. والرشة الثالثة كانت بعد الثانية بأسبوعين. وقد أظهرت النتائج ان معاملات الكالسـيوم زادت من محتوى الأوراق بعنصر الكالسيوم عن معاملات البوتاسيوم والكنترول بينما أظهرت معاملة نترات الكالسيوم و البوتاسيوم جرين بتركيز ١ % أعلى النسـب فـى حين كان محتوى الأوراق من البوتاسيوم والكالسيوم فى ديزرت رد أعلى من محتواها فى صنف فلوريدا برنس . وقد أظهرت النتائج ان معاملة البوتاسيوم جرين بتركيـز ١ % تؤدى إلى زيادة المحصول وتحسين صفات جودة للثمار.