

EFFECT OF PRE-HARVEST SPRAY OF CHEMICALS ON THE QUALITY OF POMEGRANATE FRUITS

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Received: September, 2012

Pomegranate (*Punica granatum* L.) is one of the favourite table fruit of tropical and sub-tropical regions where it has enjoyed the consumers' patronage for its healthy dietetic and medicinal properties. Pomegranate is a shrub commercially grown for its acid sweet fruit mainly used for dessert purpose, while its cool refreshing juice makes a delicious drink. Most parts of the pomegranate trees are useful to remedy many common day to day ailments. Foliar application of nutrients can supply essential elements direct to the foliage at times when rapid repose may be desired. The foliar applied chemicals mainly influence the chemical constituents and are highly effective and bring rapid intact response.

An investigation was carried out during the hast bahar of 2009-10 at horticultural farm, K.N.K. College of Horticulture, RVSKVV Mandsaur, Madhya Pradesh. The experiment was laid out with four levels each of Calcium nitrate ($\text{Ca}(\text{NO}_3)_2$) (0, 0.25, 0.50 and 1.0%) and Potassium dihydrogen ortho phosphate (KH_2PO_4) (0, 0.25, 0.50 and 1.0%) in factorial RBD with three replications. These treatments were replicated three times and one plant was taken in each treatment unit. Plants were sprayed with water with teepol as a surfactant and control

alone with water at 120 days after full anthesis. Fruits were harvested at 150 days after full anthesis (DAFA) and analysed for chemical characters. The total soluble solids were determined by hand refractometer and expressed in °Brix. The titratable acidity (%) was determined by simple acid-alkali titration method as procedure advocated by A.O.A.C. (1985). The reducing and total sugars were estimated as per the method of by Nelson (1944) and expressed in per cent. Ascorbic acid content was also calculated as per the procedure Assay method was followed given by Ranganna (1977). The phenols were determined according to Swain and Hills (1959).

A perusal of data (Table 1) revealed that the effects of levels of calcium nitrate on T.S.S. and total phenol were found significant over control. The T.S.S. and total phenol were found maximum 17.15° Brix and 413.25 respectively with the application of $\text{Ca}(\text{NO}_3)_2$ @ 1.0%, which may be due to lesser utilization of sugars in metabolic processes as a result of produced respiration (Calcium is known to retard respiration rate) and increase in rate of photosynthesis which might have resulted more accumulation of sugars. This result elucidates the findings of Heshi *et al.* (2001) in pomegranate.

Table1: Effect of pre harvest spray of chemicals on quality of pomegranate fruits Cv. Mridula

| Treatments | TSS (°B) | Titration Acidity (%) | TSS: Acid Ratio (%) | Reducing Sugars (%) | Non reducing sugars (%) | Total sugars (%) | Total phenol (mg GAE/L) |
|-------------------------------|----------|-----------------------|---------------------|---------------------|-------------------------|------------------|-------------------------|
| $\text{Ca}(\text{NO}_3)_2$ 0% | 15.87 | 0.41 | 39.91 | 9.38 | 4.00 | 13.47 | 379.00 |
| 0.25% | 16.05 | 0.41 | 40.09 | 9.92 | 4.58 | 14.50 | 382.00 |
| 0.5% | 16.84 | 0.41 | 40.46 | 10.16 | 4.76 | 14.63 | 403.75 |
| 1.0% | 17.15 | 0.42 | 39.72 | 10.03 | 5.07 | 15.08 | 413.25 |
| SEm ± | 0.57 | 0.005 | 0.93 | 0.31 | 0.31 | 0.66 | 4.36 |
| C.D (P=0.05) | 0.15 | NS | NS | NS | NS | NS | 12.62 |
| KH_2PO_4 0% | 16.36 | 0.40 | 38.84 | 8.77 | 4.16 | 12.81 | 366.50 |
| 0.25% | 16.43 | 0.41 | 38.91 | 9.70 | 4.44 | 14.15 | 386.25 |
| 0.5% | 16.52 | 0.41 | 40.32 | 10.52 | 5.01 | 15.54 | 405.75 |
| 1.0% | 16.58 | 0.42 | 41.49 | 10.51 | 4.77 | 15.08 | 419.50 |
| SEm ± | 0.52 | 0.005 | 0.93 | 0.31 | 0.31 | 0.66 | 4.36 |
| C.D (P=0.05) | 0.15 | NS | NS | 0.89 | NS | 1.91 | 12.62 |

The foliar sprays of potassium dihydrogen orthophosphate were found to have significant

influence on the total soluble solids, total phenol, and reducing and total sugars percentage. The Total

soluble solids, total phenol, reducing and total sugars percentage increased with the increased levels of potassium dihydrogen orthophosphate. However, the maximum total phenol was obtained with the application of KH_2PO_4 @ 1.0%, whereas minimum observed under control. This might be due to calcium might have helped to stimulate the action of enzyme responsible for synthesis of the total phenol and its precursor (glucose-6-phosphate) and having mechanism in regulating plant metabolic process and

resulting in accumulation of the total phenol. K^+ applied as a pre harvest foliar spray might be responsible for more accumulation of food material in the fruits. These findings are in conformity with the findings of Samadloiy *et al.* (2008) in pomegranate. The increase in total sugars and reducing sugars might be due to increase in rate of photosynthesis which resulted in more accumulation of sugars (Singh *et al.*, 1987). The results are in conformity with the findings of several workers, (Heshi *et al.* 2001).

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