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EFFECT OF FOLIAR APPLICATION OF POTASSIUM COMPOUNDS ON YIELD AND QUALITY OF BER (*ZIZYPHUS MAURITIANA* LAM.) CV. BANARASI KARAKA

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ABSTRACT

An experiment was conducted to study the effect of foliar application of potassium compounds viz., KNO_3, K_2SO_4, KH_2PO_4 and KCl on fruit retention, yield and physico-chemical attributes of Banarasi Karaka ber. The concentrations of potassium compounds were 1% and 2%. The highest fruit retention, fruit yield/tree, fruit size, weight, pulp/stone ratio, TSS and ascorbic acid were noted at 2% K_2SO_4 with the lowest acid content.

KEYWORDS: Foliar Spray, Ber {(*Zizyphus mauritiana* Lam.) cv. Banarasi Karaka}, Effect on Yield and Physico-Chemical Quality, Potassium Compounds

INTRODUCTION

Ber is a hardy and profitable fruit crop. It grows successfully under rainfed condition with little inputs and care. Banarasi Karaka cultivar is commercially grown in Northern India as a mid season crop. Application of potassium compounds as foliar spray has been proved beneficial in a number of fruit crops (Bose *et al.*, 1999). However, the effect of different potassium compounds on yield and quality on Banarasi Karaka ber has not been studied yet. Therefore, the present investigation was undertaken to study the effect of potassium compounds on yield and quality of Banarasi Karaka ber fruits.

MATERIALS AND METHODS

The investigation was carried out on thirty year old Banarasi Karaka ber plants growing at the Horticultural Research Farm, Department of Horticulture, Institute of Agricultural Sciences, Banaras Hindu University (India) during 2012-2013. The different potassium compounds with 1% and 2% were applied as foliar sprays in the month of November (after the fruit set) and subsequently in January (at half grown stage of fruits) and February (at full grown stage of fruits) using teepol @ 0.5 ml/L as surfactant. The control plants were fed with water containing only teepol. The experiment was laid out in randomized block design (RBD) with three replications. A plant was treated as a unit for a treatment in each replication. The standard procedures were followed for recording physical parameters of fruits. Total Soluble Solids (TSS) of fruits was determine by ERMA hand refractometer and values were corrected at 20^0 C (A.O.A.C, 1990). Acidity was worked out by titrating the known amount of aliquot against N/10 NaOH using phenolphthalein as an internal indicator and values were expressed in % as anhydrous citric acid. Ascorbic acid was estimated by titrating the known amount of aliquot against 2, 6-dichlorophenol indophenols dye solution and reported in mg/100g fresh weight.

RESULTS AND DISCUSSIONS

The data presented in Table 1 revealed that potassium compounds considerably increased physico-chemical

attributes of fruits. The increase in the fruit size, weight, pulp/stone ratio, TSS and ascorbic acid was noted. However, there was a considerable reduction in acid content of fruits by application of potassium compounds. Potassium sulphate at 2% tended the highest yield. The increase in the yield by the application of potassium compounds might be due to the direct and indirect involvement of potassium in increasing fruit setting, retention and reducing fruit drop. These events affected the number of fruits per tree finally retained on a tree and thus increased the total yield of the fruits. The maximum length of the fruit (42.05 mm) and thickness (30.45 mm) were recorded at 2% K_2SO_4. The minimum length (38.12 mm) and thickness (25.77 mm) were found under control. The data collected on the fruit weight revealed that the highest fruit weight (20.66 g) was with 2% K_2SO_4, while it was the lowest (14.0 g) under control (Table 1). These findings are in conformity with those reported by Dutta *et al* (2011), Sarrwy *et al* (2012), Singh and Singh (1981).

The effect of the potassium compounds on TSS and ascorbic acid was significant with 2% K_2SO_4 as compared to other potassium compounds. The highest TSS (16.5%) and ascorbic acid (127.48 mg/100g) were found at 2% K_2SO_4 and the lowest were observed under control. However, the acidity of the fruits showed inverse order being maximum (0.25 %) under control, followed by 1% KH_2SO_4 and 1% KCl. The minimum (0.18 %) acid content was noted with 2% K_2SO_4. The reduction in the acidity might be owing to increased TSS of the fruits. These results corroborate the findings of Singh and Tripathi (1978).

CONCLUSIONS

The effect of foliar application of potassium compounds, namely., KNO_3, K_2SO_4, KH_2PO_4 and KCl, each with concentrations 1% and 2%, has been investigated on the fruit yield and quality of Banarasi Karaka ber. The present investigation revealed that the potassium compounds enhanced the fruit yield and physico-chemical attributes of the fruits considerably. The highest fruit retention, fruit yield/tree, fruit size, weight, pulp/stone ratio, TSS and ascorbic acid content and the lowest acidity were found due to the foliar application of 2% K_2SO_4.

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APPENDICES

Table 1: Effect of Foliar Application of Potassium Compounds on Yield and Physico-Chemical Composition of Ber cv. Banarasi Karaka Fruit

Treatment	Fruit Length (mm)	Fruit Thickness (mm)	Fruit Weight (g)	Pulp/ Stone Ratio	TSS ^{0} Brix	Acidity as Anhydrous Citric Acid (%)	Ascorbic Acid(mg/100 g of Pulp)	Fruit Yield (kg/tree)
K_2SO_4 ; 1.0 %	41.25	29.82	20.19	16.68	15.2	0.20	106.89	117.94
K_2SO_4 ; 2.0 %	42.05	30.45	20.66	17.62	16.5	0.18	127.48	121.34
KNO_3 ; 1.0 %	40.60	28.21	17.70	14.55	15.5	0.20	80.16	109.64
KNO_3 ; 2.0 %	40.88	28.43	18.80	15.01	15.9	0. 19	93.52	111.40
KCl ; 1.0 %	39.20	26.76	15.40	15.43	14.3	0.23	80.16	91.50
KCl ; 2.0 %	39.45	27.06	15.70	18.06	14.9	0.21	100.20	99.20
KH_2PO_4: 1.0 %	40.31	27.70	17.09	15.64	13.6	0.23	86.84	100.96
KH_2PO_4: 2.0 %	40.38	28.41	17.70	16.78	14.5	0.21	113.59	104.30
Control (water)	38.12	25.77	14.00	13.56	12.9	0.25	73.48	85.70
CD at 5 %	1.825	0.841	0.577	1.154	0.033	0.024	1.154	8.05