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Response of foliar spray of water soluble fertilizers on quality parameters of banana fruits Cv. grand nain

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Abstract

The present experiment entitled "Response of foliar spray of water soluble fertilizers on quality parameters of banana fruits cv. Grand Nain" was conducted during the year 2011-12, 2012-13 and 2013-14 at Regional Horticultural Research Station, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari (Gujarat). The experiment was laid out with eleven treatments in a Randomized Block Design (RBD) and replicated three times. The treatments included SOP (1.0%, 1.5% and 2.0%), Urea (1.0%, 1.5% and 2.0%), KNO₃ (0.5%, 1.0% and 1.5%) and Pouch feeding (300g fresh cow dung + 20g Ammonium Sulphate + 10g SOP) along with control. The first spray was done immediately after complete emergence of bunch and second spray was done 15 days after the first spray. All bunches were covered with 18μ blue polythene. Quantity parameters were recorded and analyzed statistically. Results of present investigation revealed that the reducing sugar and total sugar were recorded maximum in SOP 1.5% treatment. While, maximum TSS and shelf life were recorded in SOP 1.0% and non-reducing in KNO₃ 0.5%. Spraying of KNO₃ 1.0% exerted maximum score of organoleptic taste for colour, flavor, taste and texture.

Keywords: grand nain, sleeving, pouch feeding, SOP, urea and KNO₃

Introduction

India is the largest banana consumer and producing country in the world followed by Brazil, contributing about 15 per cent of the total world production. Among the fruits, banana holds first position in production and productivity in India. It ranks second in area after mango. Now-a-days, the practices of application of chemicals on banana bunch for improving the growth, maturity, yield and quality of fruits is gaining popularity. Urea as a nitrogenous fertilizer is well known for its growth promoting activity in plant tissues. Urea can be expected to prolong the growth period of developing fruits by keeping them in an active stage of growth (Gandhi, 1984) [2].

Bunch feeding in banana, the technology of enhancing the size of fingers of banana in suit the market demands by de-navelling and post-shooting feeding of N, K and S through the distal stalk-end of rachis was successfully developed by Navsari Agricultural University Scientists. De-navelling saves mobilization of nutrients into the unwanted sink of banana plant and earns additional income when the excised male bud is used as a vegetable.

Sulphate of Potash spray getting higher bunch size with good quality. It helps in photosynthesis thus, reflecting in fruit size and yield. The higher chlorophyll content in leaves and developing fruits reflects the efficiency of photosynthesis.

Material and Methods

An experiment was conducted at Regional Horticultural Research Station, Navsari Agricultural University, Navsari to study the "Effect of post shooting foliar spray of fertilizers on quality parameters of banana (*Musa paradisiaca* L.) cv. Grand Nain" during the year 2012-13. The experiment was laid out with eleven treatments in a Randomized Block Design (RBD) and replicated three times. The treatments included SOP (1.0%, 1.5% and 2.0%), Urea (1.0%, 1.5% and 2.0%), KNO₃ (0.5%, 1.0% and 1.5%) and Pouch feeding (300g fresh cow dung + 20g Ammonium Sulphate + 10g SOP) along with control. The first spray was done immediately after complete emergence of bunch and second spray was done 15 days after the first spray. All bunches were covered with 18μ blue polythene. The pits of 30 x 30 x 30 cm

were dug out and planting was done in the month of August at a spacing of 2.4 m x 1.2 m. All the packages of practices of banana crop are carried out as per recommendation of university.

Results and Discussion

The data presented in table 1 showed the quality character viz., TSS, reducing sugar, non reducing sugars, total sugars and organoleptic test in banana which were affected due to various foliar applications of fertilizers. All these parameters had significant difference through various treatments.

The maximum TSS percentage was noted in foliar spray of SOP 1.0% treatment. This might be due to post shooting application of K favours the conservation of starch into simple sugars during ripening by activating sucrose synthase enzyme, resulting higher sugar content in fruits. Similar results were also noted by Venkatarayappa *et al.* (1979) [12], Kumar and Kumar (2010) [5] and Kumar *et al.* (2008) [4] in banana.

The maximum reducing sugar was noticed in SOP 1.5%. This result also found by Kumar and Kumar (2007) [6] and (2008) [7] in banana.

The maximum non- reducing sugar was obtained in KNO₃ 0.5%. In plants well supplied with K, the osmotic potential of the phloem sap and the volume flow rate are higher than in

plants supplied with low K level and as a result, sucrose concentration in the phloem sap is increased. Such results were also supported by Singh and Varma (2011) [10] in mango cv. Kesar.

The maximum total sugar was noted in SOP 1.5% treatment this might be due to potassium is involved in carbohydrate synthesis, breakdown and translocation and synthesis of protein and neutralization of physiologically important organic acids (Tisdale and Nelson, 1966). Besides K is involved in phloem loading and unloading of sucrose and amino acids and storage inform of starch in developing fruits by activating the enzymes starch synthase (Mengel and Kirkby, 1987). Similar results were also recorded by Kumar and Kumar (2010) [5], Kumar *et al.* (2008) [7] and Venkatarayappa *et al.* (1979) [12] in banana.

The maximum score for colour, flavour, Taste and texture were recorded in KNO₃ 1.0% treatment. Plants with an adequate supply of K have better texture, colour, taste, flavour and also produce quality fruits free from the signs of pests and diseases therefore KNO₃ 1.0% retained maximum score for organoleptic taste (Anonymous, 2013).

The results of present experiment indicated that the significantly maximum shelf life of the fruits recorded in 1.0% SOP. It is also reported by Kumar *et al.* (2008) and Kumar and Kumar (2010) [5] in banana.

Table 1: Effect of post shooting foliar spray of fertilizers on quality of banana cv. Grand Nain (Mean of three years)

Treatments	TSS (%)	Reducing Sugar (%)	None-reducing Sugar (%)	Total sugars (%)	Shelf life (days)	Organoleptic Test			
						Colour	Flavour	Taste	Texture
T ₁ - Control	19.85	4.71	6.80	11.41	8.60	5.98	5.95	5.96	5.93
T ₂ - SOP 1.0%	22.90	6.00	7.71	13.80	13.38	6.96	6.93	6.91	6.92
T ₃ - SOP 1.5%	22.22	6.06	7.80	13.92	12.07	7.86	7.94	7.89	7.88
T ₄ - SOP 2.0%	21.63	5.20	7.46	12.56	11.34	7.66	7.93	7.78	7.79
T ₅ - Urea 1.0%	20.77	5.05	7.46	12.41	11.74	7.25	7.30	7.19	7.23
T ₆ - Urea 1.5%	20.90	4.58	6.45	11.13	12.81	7.31	7.44	7.25	7.19
T ₇ - Urea 2.0%	20.59	4.52	6.27	10.94	10.70	7.03	7.19	6.98	7.03
T ₈ - KNO ₃ 0.5%	21.08	5.59	7.91	13.45	10.22	7.01	6.89	6.87	7.05
T ₉ - KNO ₃ 1.0%	22.51	5.88	7.81	13.65	9.14	8.06	8.05	8.07	8.09
T ₁₀ - KNO ₃ 1.5%	21.90	5.36	7.43	13.05	8.76	7.93	7.92	7.99	7.97
T ₁₁ - Pouch feeding	20.18	4.90	7.42	11.96	10.00	6.86	6.83	6.81	6.79
S.Em±	0.36	0.14	0.20	0.26	0.32	0.30	0.30	0.30	0.30
CD at 5%	1.02	0.39	0.60	0.73	0.91	0.90	0.88	0.89	0.88
Y X T									
S.Em±	0.63	0.24	0.28	0.45	0.56	0.42	0.43	0.42	0.42
CD at 5%	NS	NS	NS	NS	NS	NS	NS	NS	NS
CV%	5.09	7.77	5.01	6.15	8.98	7.18	7.02	7.54	7.22

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