

Effect of plant growth regulators and micronutrients on quality of banana cv.

BASRAI

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ABSTRACT

A field experiment was conducted to find out the effect of plant growth regulators and micronutrients on quality of banana (*Musa* spp.) cv. BASRAI. The maximum weight of mature finger (150.33 g) and ripe finger (143.44 g) was recorded in GA₃ 80 ppm which was significantly superior over all other treatments. Minimum per cent loss in weight during ripening (3.84%) was observed in waxol 6% while maximum in control (7.92%). Maximum pulp to peel ratio (2.83) was recorded in treatment, IAA 80 ppm and minimum in control (2.41). Maximum total sugar (15.90 %) and reducing sugar (12.09%) was observed in GA₃ 80 ppm and two sprays of 1% micronutrient mixture, respectively. Highest TSS (20.71%) were recorded in IAA 80 ppm. Highest non reducing sugar (3.92%) and maximum Vit. C (0.96) was recorded in GA₃ 80 ppm while maximum pH (5.39) was found in two spray of 1% micronutrient mixture.

Key words : TSS, Reducing sugar, pH, Vit.C, Waxol

The edible banana (*Musa* spp.) is believed to have originated in hot tropical regions of South-East Asia (Spiden, 1926 and Suar, 1952). It is dessert fruit for millions, is used in different regions as staple food owing to its rich and easily digestible carbohydrates. It is rich source of vitamins, minerals and has several medicinal properties. It is grown across the country in tropical and subtropical regions. In Maharashtra total area under banana is 72.20 thousand ha and production is 4.45 million tones. The productivity of banana is 60.00 tonnes ha⁻¹ being highest in the country (Anonymous, 2001 b).

In India, people prefer fresh fruits instead of canned products. Banana is also one of the fruits, people prefer fresh, the economics of banana depends on the cost of transportation and storage. However, low shelf life and bad transportability are two major problems in case of banana. It is generally harvested when green between 70 to 100 per cent maturity and ripened before consumption (Paul Thomson *et al.*, 1968). Pre harvest and post harvest handling of banana fruits is an important aspect of banana trade. Early and even maturity of bunches are the immediate needs of the banana growers of the region. In view of the above an investigation was conducted to find out the effect of plant growth substances and micronutrients on quality of banana cv. BASRAI.

MATERIALS AND METHODS

A field experiment was conducted at College of Horticulture, Marathwada Agricultural University, Parbhani during 2002-2003. The experiment was laid out

in Randomized Block Design with 8 treatments, viz., T₁- Control, T₂- GA₃40ppm, T₃ GA₃80 ppm, T₄-IAA 40ppm, T₅- IAA 80 ppm, T₆-micronutrients mixture 1 % one spray, T₇- micronutrients mixture 1 % two spray and T₈- waxol 6 %.

All recommended cultural practices were followed after planting. The stock solutions of IAA and GA₃ were prepared by dissolving 1 g of respective growth regulator in 50 ml alcohol and distilled water was added to make volume to one liter. The required concentration of micronutrients mixture was prepared by directly mixing required quantity of micronutrient mixture in water and those spray solutions were used for spraying immediately after preparation. Spray was given just before flowering by using a hand sprayer. Precautions were taken to avoid the drizzling of the sprays on the other treatments. After harvesting the banana, bunches were completely dipped in 6 % waxol solution for 30 to 40 seconds. The ripened fruits were peeled with hands and pulp was chopped, blended to homogeneous mixture in a mortar and pestle and this mixture was used for chemical analysis. Observations were recorded and statistically analysed as per the methods given by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Effect on physical characters :

It is evident from the data shown in Table 1 that there was significant effect of plant growth regulators

Table 1 : Effect of plant growth regulators and micronutrients on physical characters of banana (*Musa spp.*) cv. BASRAI

Treatment no.	Treatments	Weight of mature finger (g)	Weight of ripe finger (g)	% loss in weight during ripening	Pulp to peel ratio
T ₁	Control	128.25	118.09	7.92	2.41
T ₂	GA ₃ 40 ppm	148.24	140.38	5.30	2.72
T ₃	GA ₃ 80 ppm	150.33	143.44	4.58	2.71
T ₄	IAA 40 ppm	140.35	134.04	4.49	2.75
T ₅	IAA 80 ppm	141.77	135.43	4.47	2.83
T ₆	Micronutrient mixture 1 % 1 spray	143.00	136.03	4.87	2.74
T ₇	Micronutrient mixture 1 % 2 spray	146.84	139.79	4.80	2.76
T ₈	Waxol 6 %	132.46	127.37	3.84	2.51
SE ±		1.66	1.49	0.08	0.04
C.D. (P=0.05)		4.90	4.37	0.26	N.S.

NS = Non significant

and micronutrients on weight of mature finger, weight of ripe finger and per cent loss in weight. No significant influence was noticed in pulp to peel ratio. Maximum weight of mature finger (150.33 g) was recorded in GA₃ 80 ppm which was at par with GA₃ 40 ppm (148.24 g), two sprays of 1% micronutrients mixture (146.84 g) and minimum was recorded in control (128.25 g). Maximum weight of ripe finger (143.44 g) was recorded in GA₃ 80 ppm which was at par with GA₃ 40 ppm (140.38 g) and two sprays of 1% micronutrient mixture (139.79 g) and minimum was recorded in control (118.09 g). These results are in conformity with the reports of Chellappan (1983), Abdel Kader *et al.* (1992), Ulthaih *et al.* (1993).

Minimum per cent loss in weight (3.84 %) was recorded in waxol 6% which was significantly superior over all the treatments and maximum was recorded in control (7.92%). Maximum Pulp to peel ratio was recorded in IAA 80 ppm (2.83) followed by two sprays of 1% micronutrient mixture (2.76), IAA 40 ppm (2.75) and one spray of 1% micronutrient mixture (2.74). Similar results were also reported by Utthaih *et al.* (1993) and

Patil and Hulmani (1998).

Effect on chemical characters :

It is evident from the data shown in Table 2 that there was significant effect of plant growth regulators and micronutrients on TSS and Vit. C. No significant influence was noticed in total sugar, reducing sugar, non reducing sugar and pH. Maximum TSS (20.71 %) was recorded by IAA 80 ppm which was at par with IAA 40 ppm (20.55 %), two sprays of 1% micronutrients mixture (19.95 %) and minimum was recorded in control (19.05%). Similar results were also reported by Aziz and Wahab (1970), Rao *et al.* (1971), Srinivasan (1971), Sharma (1976), Jadhav and kadam (1990), Ghanta and Dwivedi (1993), Das (1995) and Deo (1996).

Highest total sugar (15.90 %) was recorded in GA₃ 80 ppm followed by IAA 80 ppm (15.85%), two sprays of 1% micronutrient mixture and lowest was recorded in waxol 6% (15.01%). Highest reducing sugar (12.09 %) was recorded by two sprays of 1% micronutrients mixture (15.85%) and minimum was recorded in control (11.91).

Table 2 : Effect of plant growth regulators and micronutrients on chemical characters of banana (*Musa spp.*) cv. BASRAI

Treatment no.	Treatments	TSS (%)	Total sugar%	Reducing sugar%	Non reducing sugar%	Vit. C (mg/100g pulp)	pH
T ₁	Control	19.05	15.09	11.91	3.18	0.66	5.30
T ₂	GA ₃ 40 ppm	19.80	15.69	11.95	3.74	0.88	5.34
T ₃	GA ₃ 80 ppm	19.63	15.90	11.98	3.92	0.96	5.35
T ₄	IAA 40 ppm	20.55	15.75	11.96	3.79	0.80	5.33
T ₅	IAA 80 ppm	20.71	15.85	12.05	3.80	0.73	5.32
T ₆	micronutrient mixture 1 % 1 spray	19.95	15.25	11.09	3.26	0.65	5.33
T ₇	micronutrient mixture 1 % 2 spray	20.35	15.85	12.09	3.76	0.69	5.39
T ₈	Waxol 6 %	19.75	15.01	12.00	3.01	0.75	5.41
S.E. ±		0.36	0.38	0.17	0.14	0.02	0.13
C.D. (P=0.05)		1.06	N.S.	N.S.	N.S.	0.07	N.S.

NS = Non significant

Remaining treatments were statistically similar to each other. Maximum non-reducing sugar (3.92 %) was recorded in GA₃ 80 ppm which was statistically similar to other treatments and minimum was recorded in waxol 6% (3.01%) Similar results were also reported by Aziz and Wahab (1970), Rao *et al.* (1971), Srinivasan (1971), Sharma (1976) and Jadhav and Kadam (1990).

Maximum Vit. C was recorded in GA₃ 80 ppm (0.96) followed by GA₃ 40 ppm (0.88), IAA 40 ppm (0.80) and minimum was recorded in control (0.66). Highest pH (5.39) was recorded in two sprays of 1% micronutrients mixture and minimum in control (5.30). Similar result, was also obtained by Ladh *et al.* (1971), Rao *et al.* (1971), Srinivasan (1971), Jadhav and Kadam (1990) and Ghanta and Dwivedi (1993).

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