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Influence of different Levels of NAA and 2, 4, 5-T on Fruit Quality of Indian Ber (*Zizyphus mauritiana* Lamk.)

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ABSTRACT: The experiment was carried out at Horticulture Garden, Department of Fruit Science, C. S. Azad University of Agriculture and Technology, Kanpur (U.P.) during two subsequent years *i.e.,* 2020-21 and 2021-22 on 48 years old plants of cv. Banarasi Karaka. These plants were pruned every after four years to maintain uniformity in growth and fruiting height. For this experiment there were sixteen treatments *viz.,* four levels each of NAA (0, 20, 30 and 40 ppm) and 2,4,5-T (0, 10, 20 and 30ppm) were studied in a Factorial Completely Randomized Design with three replications. Spraying of these plant bio-regulators was done on the eleventh of November, 2020 in the first year and fifteenth of November, 2021 in the second year at pea stage of fruit setting stage with a fine nozzle sprayer in each treatment to give uniform spray on ber plant. Application of NAA @ 40 ppm and 2,4,5-T @ 30 ppm produced fruits with significantly more pulp weight (34.65 and 34.70 g), maximum pulp: stone ratio (35.62 and 35.82) and minimum acidity percentage (0.08 and 0.07%). Total soluble solid content was significantly increased (16.75 and 17.12°Brix) by application of NAA @ 40 ppm and 2,4,5-T @ 30 ppm during both years of experimentation. The maximum TSS: acid ratio (211.54 and 239.92), maximum vitamin-C (92.30 and 93.66 mg) was also recorded with the treatment of NAA @ 40 ppm and 2,4,5-T @ 30 ppm. The highest reducing sugar content (4.91 and 4.93 %) was recorded with treatment combination of N_2A_3 (NAA @ 30ppm and 2,4,5-T @3 0ppm). The maximum non-reducing sugar (5.30 and 5.70 %), maximum total sugar content (10.62 and 8.61 %) was significantly found under NAA @ 40 ppm and 2,4,5-T @ 30 ppm during both the years of experimentation in the plains of northern India.

Keywords: 2,4,5-T, TSS, Titratable acidity, NAA, Total sugar, Non-reducing sugar, Reducing sugar, Pulp weight.

INTRODUCTION

Ber (*Zizyphus mauritiana* Lamk.), a member of family Rhamnaceae, is one of the ancient and common fruits of the Indo-China region and has been grown in the Indian subcontinent since times immemorial for fresh fruits. India ranks first among the ber growing countries of the world with an area of 50,000 ha and annual production of 5.13 lakh MT (NHB Database, 2018-19). It grows even on marginal soil and various kinds of wasteland situations such as sodic saline soil, ravines, arid, semi-arid region including the plated area of Bundelkhand and South India. Regarding its distribution, it grows most widely in plains of Punjab, U.P., Haryana, Rajasthan, M.P., Bihar, Maharashtra, Assam, A.P., Tamil Nadu and West Bengal. In U.P. ber orchards are found around Varanasi, Aligarh, Saharanpur, Faizabad, Agra and Raebareli districts because of their excellent yield and economic returns. It is often mentioned as poor man's fruit, it is cultivated widely for its resistance to growing in drought and diversified soil and climatic conditions and is known as the "King of Arid Fruits". The ripe ber fruits are rich in nutritive value. The ripe ber fruits have high nutritive values and conventionally it is considered a "Poor man's fruit" The ber fruit is richer than an apple in protein, phosphorus, calcium and Vitamin 'C' (Bakhshi and Singh 1974) and one hundred grams of edible ber fruit contains moisture (85.9%), protein (0.8g), fat (0.1g), carbohydrate (12.88%), calcium (0.03g), phosphorus (0.03g), iron (0.8g), carotene (70 IU) and vitamin 'C' (50-100mg).

MATERIALS AND METHODS

The well-established healthy and uniform trees of ber cultivar Banarasi Karaka were selected for the purpose of experimentation. The trees were about 48 years old and were properly maintained by adopting proper horticultural practices and recommended doses of plant hormones during the course of an investigation, the whole orchard was kept under clean and uniform cultural practices. The plant growth regulator was sprayed on the branch of each experimental tree. For this experiment there were sixteen treatments *viz.,* four levels each of NAA (0, 20, 30 and 40 ppm) and 2,4,5-T (0, 10, 20 and 30ppm) were studied in a Factorial Completely Randomized Design with three replications. Spraying of these plant bio-regulators was done on the eleventh of November, 2020 in the first year and fifteenth of November, 2021 in the second year at pea stage of fruit setting stage with a fine nozzle sprayer in each treatment to give uniform spray on ber plant. The observations on pulp weight (g), were recorded from ten randomly selected fruits with mechanical weighing machine. The TSS of fruits was recorded with the assistance of an Erma hand refractometer. The titratable acidity (%), reducing sugar (%), non-reducing sugar (%) and total sugar (%), contents were determined by the techniques as recommended by AOAC (1980).

RESULTS AND DISCUSSION

Weight of Pulp (g). Regarding different concentrations of NAA and 2,4,5-T on the weight of pulp is an expression of quality parameters of the plants which were influenced by NAA and 2,4,5-T growth regulators over control (Table 1). It obviously appeared from a vision of the data that all the concentrations of NAA significantly influenced to the weight of pulp in ber fruit. The interactive effect of NAA and 2,4,5-T also influenced significantly on the weight of pulp in ber but the interactive treatment gave a further improvement in the weight of pulp over the main effect. The maximum of (34.65 and 34.70 g) weight of pulp was noted under N_3A_3 treatment (NAA @ 40 ppm and 2,4,5-T @ 30 ppm) treatment over interactive control *i.e.,* N_0A_0 recorded (17.59 and 17.57 g) weight of pulp during both the years of experimentation. The effect of NAA on plant growth is greatly dependent on the time of admission and concentration. Growth regulator NAA might have improved the synthesis of more photosynthates and their translocation to the fruits which may have increased the weight of fruits and ultimately increased pulp weight in the present investigation. These result in conformity with those of Singh *et al.* (2001) in ber, Tripathi and Viveka Nand (2022) in aonla. The 2,4,5-T is probably an improvement in pulp weight caused due enhanced deposition of solids which increased in cell size by increasing the accumulation of water in intracellular space which might be enhanced to fruit weight and finally increase pulp weight. These findings get support with the reports of Bal *et al.* (1984) in ber.

Pulp: Stone Ratio. The pulp: stone ratio was influenced by various treatments of NAA and 2,4,5- T in the present investigation (Table 1). The combination of NAA and 2,4,5-T induced significant variation on pulp: stone ratio and its interactive treatment of N_3A_3 significantly maximized (35.62 and 35.82) pulp: stone ratio closely followed by N_2A_3 (34.16 and 34.90) over control *i.e.,* N_0A_0 of (24.55 and 24.55) during both the years of experimentation. Utilizing NAA growth regulator as compared to the control resulted in a decrease in stone weight and an increase in the pulp-stone ratio These results have got support the findings of Tiwari *et al.* (2017); Tripathi and Viveka Nand (2022) in aonla, Gami *et al.* (2019) in ber. The 2,4,5-T increased accumulation of food substances in the mesocarp's elongated cells and intercellular space may be the cause of the improvement in the pulp-to-stone ratio. These findings also get support with the reports of Bal *et al.* (1984) in ber.

Total Soluble Solid. The TSS in ber fruit was significantly influenced by the sprays of NAA and 2,4,5-T treatments in ber fruits. The NAA and 2,4,5-T brought about significant treatment variation on TSS and of N_3A_3 expressed a significant maximum of (16.75 and 17.12 ^{0}Brix) TSS closely followed by N_2A_3 (15.72 and 15.76 ^{0}Brix). A significant minimum of (11.94 and 11.98 ^{0}Brix) TSS content was exhibited under control (N_0A_0) during both the years of experiments (Table 2). The improvement in TSS with the use of growth regulator NAA might have caused the diversion of more solids metabolites towards developing fruits increasing amylase activity and thus, there was a conversion of starch into simple sugar thereby enhancing total soluble solid content. These findings are similar with the accordance of Lal *et al.* (2015) in Kinnow Mandarin, Singh and Singh (1976) in ber, Kumar and Tripathi (2009) in strawberry. The concentration 2,4,5-T have increased the inactivation of the amylase enzyme which is responsible ber conversion of starch into sugar which is directly affected to enhancing of TSS content in the present experimentation. Bal *et al.* (1984) in ber.

Titratable Acidity. The titratable acidity in ber fruit was significantly influenced with the sprays of NAA and 2,4,5-T treatments in ber fruits. The NAA and 2,4,5-T brought about significant treatment variation on titratable acidity and of N_3A_3 expressed significantly minimum of (0.08 and 0.07 %) titratable acidity closely followed by N_2A_3 (0.09 and 0.08 %). Significantly maximum of (1.25 and 1.22 %) titratable acidity was exhibited under control (N_0A_0) during both the years of experiments (Table 2). The Reduction in acidity might be due to the increased TSS content of fruit. This decrease in acidity with the application of NAA could be explained that organic acid might be utilized rapidly in respiration. These findings are in line with reports of Pandey (1999). The application of 2,4,5-T may be attributed to the quick metabolic transformation of starch and pectin into acidity compounds and the rapid translocation of sugars from fruit to leaves of developing fruits. These findings have collaborated with the reports of Tripathi *et al.* (2009) in ber and Ram *et al.* (2005) in ber.

TSS: Acid Ratio. The interactive effect of NAA and 2,4,5-T did differ significantly but further improvement was observed over mean values and combined treatment of N_3A_3 (NAA @ 40 ppm and 2,4,5-T @ 30 ppm) recorded maximum of (211.54 and 239.92) TSS: acid ratio against the minimum of (9.55 and 9.77) TSS: acid ratio was expressed under control (N_0A_0) during both the years of experiment (Table 3). These findings clearly indicated that NAA treatment played a significant role for improving the quality of fruits and increase in TSS content might be due to the conversion of reserved starch and other polysaccharides to soluble forms of sugars. The reason for an increase in total soluble solids content of fruit may be due to fact increase the TSS acid ratio. Lal *et al.* (2015) in Kinnow Mandarin, Tripathi *et al.* (2009) in ber, Bal *et al.* (1984) in ber. In the plant, 2,4,5-T played an important role on photosynthesis which ultimately led to the accumulation of carbohydrates and attributed to the increase in TSS of fruit the quick metabolic transformation of starch and pectin into soluble compounds and the rapid translocation of sugars from leaves to developing fruits finally increase TSS acid ratio.

Vitamin-C (mg/100g of pulp). The Vitamin-C in ber fruit was significantly influenced by the sprays of NAA and 2,4,5-T treatments in ber fruits. The NAA and 2,4,5-T brought about significant treatment variation on ascorbic acid and N_3A_3 expressed a significantly maximum of (92.30 and 93.66 mg/100g of pulp) ascorbic acid closely followed by N_2A_3 (89.97 and 90.79 mg/100g of pulp). Significantly minimum of (68.48 and 68.52 mg) of ascorbic acid was exhibited under control (N_0A_0) during both years of experimentation (Table 3). Enhancement on ascorbic acid was obtained due to treatments of NAA 20 ppm and NAA 30 ppm promoted by 24.95 and 13.08 % respectively over control (N_0). These findings collaborated with the reports of Lal *et al.* (2015) in Kinnow Mandarin, Singh *et al.* (2001) in ber. The increase in ascorbic acid content in the pulp of fruits with foliar sprays 2,4,5-T might be attributed to the higher synthesis of some metabolites and some intermediate substances which promotes the synthesis of precursors of ascorbic acid reported. These findings are in accordance with the reports of Bal *et al.* (1984) in ber, Tripathi *et al.* (2009) in ber.

Reducing Sugar (%). The effect of foliar sprays of NAA and 2,4,5-T positively influenced reducing sugar of ber fruit. The interactive treatments of NAA and 2,4,5-T showed a substantial variance. The N_3A_3 (NAA @ 40ppm and 2,4,5-T @ 30ppm) treatment induced the highest levels of reducing sugar (4.91 and 4.93 %), followed by the N_2A_3 (NAA @ 30ppm and 2,4,5-T @ 30ppm) expressed reducing sugar (4.36 and 4.37 %) while lowest (1.88 and 1.72 %) reducing was recorded with treatment combination N_0A_0 during both years of experiments (Table 4). The reducing sugars were recorded with the application of 2,4,5-T might be due to the role of auxin in carbohydrate metabolism, protein synthesis and neutralization of organic acids. The increase in reducing sugar may be due to the hydrolysis of the polysaccharides, conversion of organic acids into soluble sugars and enhanced solubilization of insoluble starch and pectin present in the cell wall and middle lamella. These findings are similar with the accordance of Lal *et al.* (2015) in Kinnow Mandarin, Singh and Singh (1976). The significant increase in reduced sugar contents might be due to the accumulation of carbohydrates in fruits as a result of increased supply/ absorption of Zn, Mn and Cu after spray of 2,4,5-T. Another reason might be due to the synergetic effect on nitrogen as well as others elements in the sugar metabolism of fruits. Bal *et al.* (1984) in ber, Tripathi *et al.* (2009) in ber.

Non-Reducing Sugar (%). Non- Reducing Sugar was influenced by various treatments of NAA and 2,4,5- T in the present investigation. The combination effect of NAA and 2,4,5-T induced significant variation on non-reducing sugar and its interactive treatment of N_3A_3 significantly maximized (5.30 and 5.70 %) non-reducing sugar closely followed by N_2A_3 (4.97 and 5.14 %) over control *i.e.,* N_0A_0 of (1.91 and 1.91 %) during both the years of experimentation (Table 4). The improvement in non-reducing sugar percent with the use of growth regulator NAA might have caused the diversion of more solids metabolites towards developing fruits increasing amylase activity and thus, there was a conversion of starch into simple sugar thereby enhancing non-reducing sugar content. These findings are similar with the accordance of Lal *et al.* (2015) in Kinnow Mandarin, Singh and Singh (1976). The concentration 2,4,5-T have increased inactive might be due to the acceleration in biochemical activities and accumulation of metabolites in plant parts which is probably due to the synergistic effect of bio-regulators on conversion and translocation of non-reducing sugar during the process of fruit development and fruit maturation. These findings have collaborated Bal *et al.* (1984) in ber, Tripathi *et al.* (2009) in ber.

Total Sugar (%). Total Sugar of ber was significantly induced with NAA and 2,4,5-T combination was found to be significant. Combined treatment of N_3A_3 (NAA @ 40 ppm and 2,4,5-T @ 30ppm) induced significantly maximum (10.62 and 8.61 %) total sugar content while the minimum (3.79 and 2.98 %) total sugar was presented with control (N_0A_0) during both years of experimentation (Table 4). The superiority brought about by NAA treatment may be attributed to the fact that this growth regulator promoted hydrolysis mechanism of starch into sugar or reduced competition between the fruits for metabolites. The increase in total sugar may attribute further to the conversion of reserved starch and other polysaccharides into a soluble form of sugar which enhanced total sugar content. These findings are similar with the accordance of Kale *et al.* (1999) in ber. Probably the 2,4,5-T increasing fruit sweetness might be due to photosynthetic activity and the formation of more carbohydrates content and its transportation are also maximized within the fruits. Under the influence of growth regulator are quickly converted into their derivatives by a reaction involving of the glycolytic pathway. These results are in line with the reports of Lal *et al.* (2015) in Kinnow Mandarin, Bal *et al.* (1984) in ber, Kumar and Tripathi (2009) in strawberry, Tripathi *et al.* (2009) in ber. Interact on between NAA and 2,4,5-T treatment proved significant variation on total sugar content in ber fruit.

Table 1: Effect of foliar application of NAA, 2, 4, 5-T and their interaction on weight of pulp and pulp stone ratio in ber (g).

Parameter	PGRs Doses 2,4,5-T ppm (A)	NAA ppm (N) 2021 N_0 Control	N_1 20	N_2 30	N_3 40	Mean B	2022 N_0 Control	N_1 20	N_2 30	N_3 40	Mean B
Weight of Pulp (gm)	A_0 Control	17.59	18.42	19.48	20.47	18.99	17.57	18.47	19.48	20.43	18.99
	A_1 10	21.40	22.44	23.52	24.34	22.92	21.47	22.52	23.62	24.55	23.04
	A_2 20	25.16	26.36	27.39	28.34	26.81	25.64	26.72	27.88	28.83	27.27
	A_3 30	29.84	30.60	32.48	34.65	31.89	30.18	31.21	32.69	34.70	32.19
	Mean A	23.49	24.45	25.72	26.95		23.71	24.73	25.92	27.13	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.16	0.16	0.32			0.05	0.05	0.10		
	C.D.	0.28	0.28	0.56			0.14	0.14	0.29		
	SE(d)	0.13	0.13	0.27			0.07	0.07	0.14		
Pulp: stone ratio	A_0 Control	24.55	24.91	25.42	25.99	25.22	24.55	25.46	25.70	26.66	25.59
	A_1 10	26.55	26.93	27.54	28.14	27.29	26.97	27.25	28.47	28.78	27.86
	A_2 20	29.16	30.27	31.13	31.96	30.63	29.53	30.46	30.99	32.22	30.80
	A_3 30	32.65	33.12	34.16	35.62	33.89	33.86	34.14	34.90	35.82	34.68
	Mean A	28.23	28.81	29.56	30.43		28.73	29.33	30.01	30.87	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.01	0.01	0.02			0.04	0.04	0.08		
	C.D.	0.03	0.03	0.06			0.12	0.12	0.24		
	SE(d)	0.01	0.01	0.03			0.06	0.06	0.12		

Table 2: Effect of foliar application of NAA, 2, 4, 5-T and their interaction on TSS (Total Soluble Solid) (°Brix) and titratable acidity (%) in ber.

Parameter	PGRs Doses 2,4,5-T ppm (A)	NAA ppm (N) 2021 N_0 Control	N_1 20	N_2 30	N_3 40	Mean B	2022 N_0 Control	N_1 20	N_2 30	N_3 40	Mean B
Total Soluble Solid (°Brix)	A_0 Control	11.94	11.97	12.36	12.33	12.15	11.98	12.02	12.47	12.37	12.21
	A_1 10	12.94	13.25	13.36	13.51	13.26	12.99	13.29	13.39	13.55	13.30
	A_2 20	13.55	14.03	14.15	14.28	14.00	13.59	14.07	14.19	14.33	14.05
	A_3 30	14.49	14.61	15.72	16.75	15.39	14.54	14.65	15.76	17.12	15.51
	Mean A	13.23	13.46	13.89	14.22		13.27	13.51	13.95	14.34	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.05	0.05	0.10			0.02	0.02	0.05		
	C.D.	0.15	0.15	0.31			0.07	0.07	0.14		
	SE(d)	0.07	0.07	0.15			0.03	0.03	0.07		
Titratable acidity (%)	A_0 Control	1.25	1.14	0.99	0.85	1.06	1.22	1.11	0.97	0.83	1.03
	A_1 10	0.73	0.60	0.49	0.40	0.55	0.70	0.57	0.46	0.37	0.52
	A_2 20	0.29	0.26	0.23	0.19	0.24	0.26	0.25	0.22	0.18	0.22
	A_3 30	0.14	0.12	0.09	0.08	0.11	0.13	0.11	0.08	0.07	0.10
	Mean A	0.60	0.53	0.45	0.38		0.58	0.51	0.43	0.36	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.00	0.00	0.01			0.00	0.00	0.01		
	C.D.	0.01	0.01	0.02			0.01	0.01	0.03		
	SE(d)	0.00	0.00	0.01			0.00	0.00	0.01		

Table 3: Effect of foliar application of NAA, 2, 4, 5-T and their interaction on TSS: Acid ratio and Vitamin C (mg/100g pulp) in ber.

Parameter	PGRs Doses 2,4,5-T ppm (A)	NAA ppm (N) 2021 N_0 Control	N_1 20	N_2 30	N_3 40	Mean B	2022 N_0 Control	N_1 20	N_2 30	N_3 40	Mean B
TSS: Acid ratio	A_0 Control	9.55	10.50	12.42	14.42	11.72	9.77	10.80	12.80	14.88	12.06
	A_1 10	17.74	22.10	27.30	33.84	25.24	18.57	23.22	28.97	36.75	26.88
	A_2 20	46.88	54.20	61.86	75.76	59.68	51.93	56.55	64.90	80.30	63.42
	A_3 30	99.56	119.67	171.33	211.54	150.53	107.32	130.78	193.26	239.92	167.82
	Mean A	43.43	51.62	68.23	83.89		46.90	55.34	74.98	92.96	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	3.17	3.17	6.35			4.54	4.54	9.08		
	C.D.	9.19	9.19	18.38			13.14	13.14	26.28		
	SE(d)	4.49	4.49	8.98			6.42	6.42	12.84		
Vitamin C (mg/100g pulp)	A_0 Control	68.48	70.05	71.10	72.77	70.60	68.52	70.07	71.11	72.81	70.63
	A_1 10	73.41	74.57	75.78	77.32	75.27	73.50	74.60	75.80	77.32	75.30
	A_2 20	79.15	80.55	82.03	83.92	81.41	79.16	80.56	82.06	83.93	81.42
	A_3 30	86.01	87.34	89.97	92.30	88.91	86.39	87.74	90.79	93.66	89.64
	Mean A	76.76	78.13	79.72	81.58		76.89	78.24	79.94	81.93	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.16	0.16	0.33			0.16	0.16	0.32		
	C.D.	0.48	0.48	0.96			0.47	0.47	0.94		
	SE(d)	0.23	0.23	0.47			0.23	0.23	0.46		

Table 4: Effect of foliar application of NAA, 2, 4, 5-T and their interaction on reducing sugar, non- reducing sugar and total sugar in ber (%).

Parameter	PGRs Doses	NAA ppm (N)									
	2,4,5-T ppm (A)	2021					2022				
		N_0 Control	N_1 20	N_2 30	N_3 40	Mean B	N_0 Control	N_1 20	N_2 30	N_3 40	Mean B
Reducing sugar (%)	A_0 Control	1.88	1.94	2.53	2.64	2.25	1.72	1.96	2.55	2.65	2.22
	A_1 10	2.75	2.93	3.19	3.25	3.03	2.77	2.94	2.90	3.30	2.98
	A_2 20	3.43	3.57	3.67	3.77	3.61	3.45	3.57	3.66	3.77	3.61
	A_3 30	3.86	4.05	4.36	4.91	4.29	3.89	4.03	4.37	4.93	4.30
	Mean A	2.98	3.12	3.44	3.64		2.96	3.12	3.37	3.66	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.01	0.01	0.03			0.04	0.04	0.09		
	C.D.	0.05	0.05	0.10			0.14	0.14	0.28		
	SE(d)	0.02	0.02	0.05			0.06	0.06	0.13		
Non-reducing sugar (%)	A_0 Control	1.91	1.98	2.20	2.46	2.14	1.91	2.02	2.24	2.50	2.17
	A_1 10	2.66	2.97	3.16	3.41	3.05	2.70	2.98	3.20	3.49	3.09
	A_2 20	3.66	3.88	4.11	4.32	3.99	3.71	3.93	4.16	4.41	4.05
	A_3 30	4.54	4.82	4.97	5.30	4.91	4.60	5.04	5.14	5.70	5.12
	Mean A	3.19	3.41	3.61	3.87		3.23	3.49	3.68	4.02	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.01	0.01	0.02			0.03	0.03	0.06		
	C.D.	0.03	0.03	0.06			0.08	0.08	0.17		
	SE(d)	0.01	0.01	0.03			0.04	0.04	0.08		
Total sugar (%)	A_0 Control	3.79	3.97	4.77	5.15	4.42	2.98	3.29	3.90	4.22	3.60
	A_1 10	5.46	5.91	6.39	6.75	6.12	4.50	4.91	4.97	5.61	5.00
	A_2 20	7.14	7.50	7.83	8.18	7.66	5.96	6.24	6.53	6.83	6.39
	A_3 30	8.46	9.09	9.50	10.62	9.42	7.11	7.55	7.89	8.61	7.79
	Mean A	6.21	6.62	7.12	7.67		5.14	5.50	5.82	6.32	
	Factors	A	B	AXB			A	B	AXB		
	SE(m)±	0.03	0.03	0.06			0.55	0.55	1.10		
	C.D.	0.09	0.09	0.19			1.59	1.59	0.55		
	SE(d)	0.04	0.04	0.09			0.78	0.78	1.10		

CONCLUSIONS

It may be concluded that the application of NAA and 2,4,5-T resulted in the quality of Indian ber with maximum TSS (Total Soluble Solid), Titratable acidity, Vitamin-C mg/100g of pulp), Total sugar which ultimately increased the quality of ber fruit with NAA @ 40ppm and 2,4,5-T@ 30ppm during both years of experiments.

FUTURE SCOPE

The use of plant bio-regulator's assumes a significant part in the higher yield of quality fruits. Since ber is now becoming an important fruit crop all over the world in the tropical and sub-tropical climate. That's why in the future, more studies can be carried out on other cultivars alone or in the combination with others on more parameters to standardize techniques according to specific regions.

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