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REVIEW ARTICLE

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## EFFECTED OF PACLOBUTRAZOL ON PHYSIO-CHEMICAL COMPOSITION OF MANGO CVS. DASHEHARI, LANGRA, CHAURA AND FAZRI

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### ABSTRACT

This Soil application of Paclobutrazol (applied as a cultur of 0.5 g/ meter canopy diameter and 1.0 g/meter canopy diameter) evaluated as a method is slightly increased TSS, Acidity total sugar, non reducing sugar, non reducing sugar,  $\beta$ -carotene, Ascorbic Acid compare to control. However the treatment is better in higher doses (1gm/meter canopy diameter) compare lower doses (0.5 gm / meter canopy diameter). The chemical name Poclobutrazol [(2 RS, 3RS)-1-(4-chlorophenly)-4, 4- dimethyl -2-[1,2,4-trizol -1-y]] pentan-3-ethanol.

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### INTRODUCTION

Paclobutrazol [(2 RS, 3RS)-1-(4-chlorophenly)-4, 4- dimethyl -2-[1, 2, 4-trizol -1-yl]] Pentan -3-ethanol did not effect sugar, pH, colour, K or glucose - fructose ratio in grapes (zoectleine et al., 1991), amino- cyclo propane, carboxylic acid, ethylene, respiration. Sorbitol, fructose, glucose, sucrose and malic acid in apple (Wang and Stiffens, 1987). Paclobutrazol reduced sugar concentration in apple (Greene and Murray 1983, Greene, 1986, Byun and Chaug 1986, Luo et at, 1989, Elfving et at 1990, El-khoreiby et at. 1990 and kim, 1991), grape (William et at, 1989, Forlanin and Coppala, 1992), Persimmon (Lee and Kim 1991), TSS in cherry (Looney and Mc kellar, 1987), acidity in apricot (Mehta et at 1990) and grape (shaltout et at., 1988, Zoecklein et at., 1991 Reynold et at., 1992). Paclobutrazol did not affect TSS and Firmness of Apple (Stiffens et at., 1988. Carry and Williams, 1986; Elfving et at, 1987, 1989), Banana (El-otmani et at, 1992), Cherry (Facteau and Chestnut. 1991), Mango (Kulkarni, 1988), Peach (Choi et at 1988, Chun et at., 1990; Chun and Lee, 1989; 1990), Pear

(Eecrobee, 1987, Hung and Shen 1987, Noma et at 1989) and Plum (stradom and Honey brone, 1987) It could not affect acidity in peach (choi et at., 1988, Chun et at. , 1990). Paclobutilized also increased fruit TSS in Apple (Vipoi et at., 1989), Grape (Reynold, 1988, 1989, Reynold et at, 1991), Plum (Chandelrand Jindal, 1991), anthroiyne in Citrus (Grilfillan and lowe, 1985) and fruit ripening was retarded by Paclobutrazol in Apple (Green and Murray, 1983, Greene, 1986; Elefving et at., 1987), Citrus (Fucik and Eaton, 1988) In contrast Paclobutrazol induced early maturity and ripening in grape Reynold, 1989. 1992), Peach (Loreti, 1987; Mqrtin et at., 1987. Zhang. 1990, George and Nissan, 1992 and Alan et at, 1993).

### MATERIALS AND METHODS

The present investigation were carried out in the department of Horticulture, college of Agriculture in G.B. Pant University of Agriculture & Technology, Pant Nagar (India).

**Treatment and Layout** - The treatment consist of different doses of paclobutrazol of different doses of paclobutrazol namely 1.0 g/meter canopy diameter and 0.5 g/meter canopy

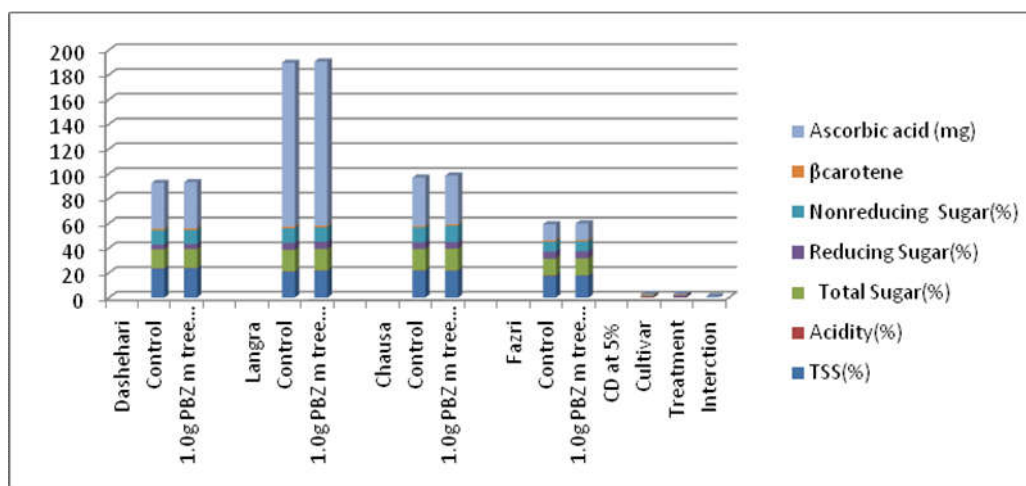
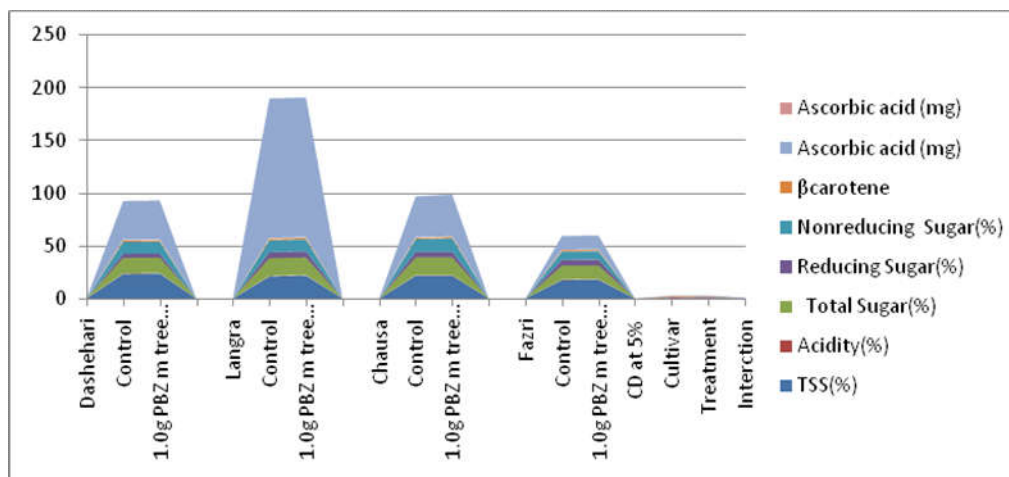
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**Table 1A. Effects Paclobutrazol treatment on fruit of mango cv. Dasher, Langra, Chausa and Fazri (1997-98)**

Treatment	TSS(%)	Acidity (%)	Total Sugar (%)	Reducing Sugar (%)	Non reducing Sugar(%)	βcarotene	Ascorbic acid (mg)
Dashehari							
Control	23.40	0.22	15.33	3.89	11.46	1.42	36.79
1.0g PBZ m tree canopy diam.	23.73	0.20	15.39	3.90	11.51	1.14	37.16
Langra							
Control	21.07	0.18	17.35	5.82	11.54	1.38	132.34
1.0g PBZ m tree canopy diam.	21.83	0.17	17.39	5.85	11.56	1.39	132.43
Chausa							
Control	21.66	0.26	17.47	5.34	12.14	1.12	38.86
1.0g PBZ m tree canopy diam.	21.71	0.25	17.51	5.36	13.23	1.13	39.35
Fazri							
Control	17.57	0.31	13.64	5.66	7.98	1.15	12.91
1.0g PBZ m tree canopy diam.	17.81	0.29	13.69	5.67	8.05	1.16	13.21
CD at 5%							
Cultivar	0.20	0.84	0.19	0.12	0.40	0.76	0.51
Treatment	0.14	0.59	0.13	0.86	0.28	0.54	0.36
Interction	0.28	NS	NS	NS	NS	NS	0.72

(Means followed by different letters within columns significantly differ by Fisher's LSD at p = 0.05)

**Fig. 1A. Effects Paclobutrazol treatment on fruit of Mango cv Dasher, Langra, Chausa and Fazri (1997-98)****Fig. 1B. Effects Paclobutrazol treatment on fruit of Mango cv Dasher, Langra, Chausa and Fazri (1997-98)**

diameter along with control. Paclobutrazol was applied once in a year as 15 October 1997 and 15 September 1998 in the soil around the tree canopy spread.

**Observation:** The observation on the fruits in the term of size, weight, volume, specific gravity etc, were recorded soon after harvest and after ripening of the fruits Skin weigh and stone size were measured separately, TSS, acidity, ascorbic acid, sugar and β- carotene were determined as describe by Ranganna (1992).

The uniform sized fruits were harvested along with 5 cm stalk length with the help of hand secateurs. Harvested fruits were washed and kept in corrugated fiber board (CFB) boxes in single layer under ambient temperature (30-33 C) for shelf life study.

**Physio Chemical Analysis:** The observation on various physio-chemical analysis character were recorded from 22 June and 22 July, harvested fruits recorded on 10 days of storage in all replications according to the experiments.

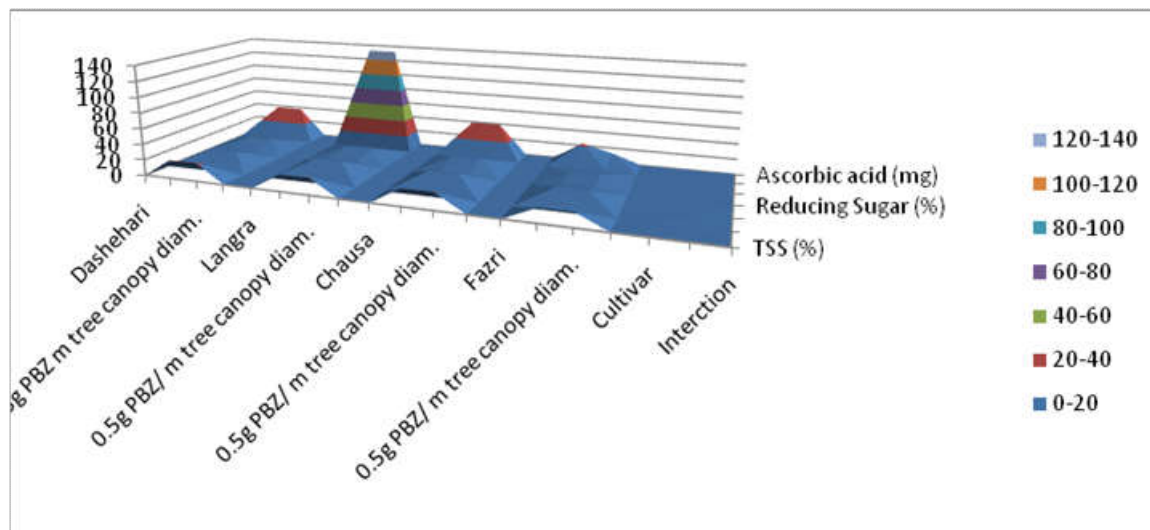


Fig. 2A. Effect of Paclobutrazol on Physio-Chemical composition of Mango Cvs. Dashehari, Langra, Chausa and Fazri (1998-99)

Table 2. Effect of Paclobutrazol on Physio-Chemical composition of Mango Cvs. Dashehari, Langra, Chausa and Fazri. (1998-99)

Treatment	TSS(%)	Acidity(%)	Total Sugar(%)	Reducing Sugar(%)	Nonreducing Sugar(%)	$\beta$ carotene	Ascorbic acid (mg)
Dashehari							
Control	23.31	0.23	15.35	3.88	11.44	1.13	37.75
0.5g PBZ/ m tree canopy diam.	23.65	0.20	15.42	3.88	11.48	1.14	37.12
Langra							
Control	21.11	0.18	17.37	5.81	11.54	1.37	132.32
0.5g PBZ/ m tree canopy diam.	21.78	0.17	17.41	5.83	11.54	1.38	132.37
Chausa							
Control	21.64	0.26	17.48	5.33	12.13	1.11	38.97
0.5g PBZ/ m tree canopy diam.	21.81	0.25	17.54	5.36	13.15	1.13	39.33
Fazri							
Control	17.54	0.31	13.64	5.67	7.46	1.14	22.89
0.5g PBZ/ m tree canopy diam.	17.75	0.29	13.73	5.65	8.04	1.16	13.17
CD at 5%							
Cultivar	0.60	0.84	0.11	0.43	0.37	0.56	0.44
Treatment	0.43	0.59	0.79	0.30	0.26	0.40	0.31
Interction	0.86	NS	NS	0.61	NS	NS	0.63

(Means followed by different letters within columns significantly differ by Fisher's LSD at  $p = 0.05$ )

The physio-chemical parameters viz, TSS was determined with the help of hand refractrometer. Acidity was estimated by titrating pulp extract with 0.1 N NaOH using phenolphthalein indicators. Total sugar,  $\beta$ - carotene etc. was determined according to method suggested by Ranganna (1992).

**Statistical Design:** The observation recorded were subjected to statically analysis by using completely randomized design for lab experiment and valid conclusion were draw only in significant differences between the treatment mean at 5% level of probability (Conchran and Cox, 1959). In order to compare treatments of critical difference were calculated.

## RESULT & DISCUSSION

Mango Cvs. Dashehari, Langra, Chausa and Fazri were kept in corrugated fibre boxes (CFB) in ambient temperature (30-33°C). The time taken for ripening in generally 11.5 days, higher doses of PBZ (1.0 g/m canopy diameter) were effective on early ripening in all the mentioned cultivars. Data 1A and 1B shown that paclobutrazol treated mango Cvs. Dashehari, Langra, Chausa and Fazri are slightly increases TSS, acidity, total sugar (Reducing & non-reducing sugar),  $\beta$ -carotene and ascorbic acid compare to lower doses (0.5 g/m canopy diameter) and with control. Paclobutrazol treated Mango Cvs.

Dashehari, Langa, Chausa and Fazri was more pronounced than these applied later and paclobutrazol were higher doses confirming the fact that was capable of increasing TSS, acidity (percent.), ascorbic acid, total sugar, reducing and non-reducing sugar,  $\beta$ -carotene in mango Cvs. and taken lower time to ripen after harvest. Data's further shows that PBZ treatment induced 1-2 days earlier ripening with reduction of fruit size, increased in weight loss with higher TSS and total sugar and low acidity and better fruit quality in terms of TSS and total sugar due to PBZ.

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