

Effect of Cultural Practices on Oil and Carbohydrate Content of Green and Red Chilli (*Capsicum annum* L.) Var. Jwala

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A field experiment was conducted during October, 1995 to May, 1996 at the College Agronomy Farm, Gujarat Agricultural University, Anand to find out the effect of mulch, nitrogen and irrigation levels on oil and carbohydrate content of chilli at green and red mature stage. The carbohydrate and oil content of chilli fruits were analyzed as they are important quality parameters and also play an important role in the yield.

'Jwala' variety of chilli was grown in four replications under split plot design taking irrigation as a main plot treatment [drip irrigation at 10% (I_1), 60% (I_2), 80% (I_3) replenishment of PE and surface irrigation at 0.7 IW/CPE ratio (I_4)] and combinations of mulch [No mulch (M_0) and black polythene sheet (M_1)] and irrigation levels [75 (F_1), 100 (F_2) and 125 (F_3) kg N ha⁻¹].

Fruit samples of similar age of green mature stage (S_1) and red mature stage (S_2) were collected separately and analyzed for oil and total carbohydrate content. Oil and total carbohydrate content was determined by

methods described by Dubois *et al.* (1956) and Sadasivam and Manickam (1992) respectively and results were reported on dry wt. basis. The laboratory analytical data of replicated samples were subjected to statistical analysis of variance (Snedecor *et al.*, 1967).

The data obtained for oil and total carbohydrates at green and red mature stage are presented in Table-1.

Oil Content

The oil content was significantly higher in fruits from $I_4M_1F_3$ combination (5.05%) being at par with $I_3M_0F_1$ (5.01%) than rest of the treatment combinations at green mature stage. The fruits from combination $I_4M_0F_2$ recorded the lowest oil content at green mature stage but was at par with $I_2M_0F_2$, $I_3M_1F_1$ and $I_4M_0F_1$. At red mature stage, among different treatment combinations $I_3M_0F_2$ (12.58%) being at par with $I_2M_1F_2$ (12.53%) than rest of the treatment combination $I_3M_0F_3$ than rest of the combinations.

Oil content was reduced significantly with increase in amount of water applied through different irrigation schedules. This may be due to the dilution effect resulted from increased carbohydrate content. The differences in fat content of fruits were not significant due to mulch treatment. No definite trend was observed with varied levels of nitrogen. Oil content of fruits was

TABLE 1

Oil and carbohydrate contents as influenced by I x M x F Interaction in green and red mature chilli.

Treatment			Green stage (S_1)		Red stage (S_2)		
Irrigation	Mulch	Fertilizer	Oil (%)	Total carbohydrate (%)	Oil (%)	Total carbohydrate (%)	
I_1	M_0	F_1	3.91	17.57	10.95	21.00	
		F_2	4.79	20.04	11.86	20.49	
		F_3	4.41	21.04	11.78	23.28	
	M_1	F_1	4.03	18.93	11.91	21.59	
		F_2	3.53	19.77	11.64	22.63	
		F_3	4.54	21.92	11.44	23.21	
	I_2	M_0	F_1	4.52	20.91	11.62	24.30
			F_2	3.52	18.59	11.62	20.50
			F_3	3.72	20.19	11.54	24.19
M_1		F_1	4.51	19.77	11.25	23.08	
		F_2	3.67	18.20	12.53	21.15	
		F_3	3.45	21.47	11.92	23.93	
I_3		M_0	F_1	5.01	20.89	11.13	23.29
			F_2	4.27	19.67	12.58	21.77
			F_3	3.72	20.51	10.60	22.53
	M_1	F_1	3.33	19.67	10.80	22.14	
		F_2	3.46	21.42	11.72	23.77	
		F_3	3.57	20.28	11.56	22.29	
	I_4	M_0	F_1	3.36	19.54	11.46	23.70
			F_2	3.31	19.72	11.01	22.64
			F_3	3.66	21.18	11.16	24.10
M_1		F_1	3.71	19.41	11.64	23.84	
		F_2	3.49	20.11	11.72	22.30	
		F_3	5.05	21.04	10.93	23.09	
S. Em.			0.05	0.11	0.05	0.11	
C. D. at 5%			0.13	0.30	0.13	0.30	
C. V. %			1.02	0.90	1.02	0.90	

increased significantly with increase in ripening. This is because of accelerated rate of lipid metabolism in the fruit at later stage of ripening (Jinap *et al.*, 1993).

Total Carbohydrate

At green mature stage fruits obtained from treatment combination $I_1M_1F_3$ (21.92%) significantly higher total carbohydrate content than rest of the treatment combinations. The content was the lowest in fruits from $I_1M_0F_1$ combination at green mature stage. At red mature stage, fruits from treatment combination $I_2M_0F_1$ (24.03%) being at par with $I_2M_0F_2$ (24.19%) and $I_4M_0F_3$ (24.10%) contained significantly higher total carbohydrate content than rest of the treatment combinations. The content, at red mature stage was significantly lower in fruits from $I_1M_0F_2$ combination than rest of the treatment combination except $I_2M_0F_2$.

Total carbohydrate content of chilli fruits was significantly increased as the amount of available water to plants increased either through irrigation or mulching with black polythene. Total carbohydrate content was the highest at higher dose of nitrogenous fertilizer (F_3). As nitrogen application increases foliage and photosynthetic activity hence, higher rates of nitrogenous fertilizer along with water might have increased total carbohydrate content. Higher marketable yield of tomato fruits was obtained, when nitrogen was applied at higher rates (Singh, and Singh, 1992). This is because of the fact that total carbohydrate content accounts for major portion of yield. Total carbohydrate content on per cent dry weight basis was

increased significantly with increase in ripening of fruits. This is because of increased metabolism of carbohydrate at later stage of fruit ripening (Almazan, 1991; Hubbard and Pharr, 1992 and MacRae *et al.*, 1992).

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