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Effect of retention of fruits on yield and quality of watermelon (*Citrullus lanatus* Thunb.)

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ABSTRACT : A field experiment was conducted in polyhouse at Hi-tech Horticulture Park, Department of Horticulture, Junagadh Agricultural University, Junagadh during Late *Kharif* season of the year 2010 with mulch to study the effect of retention of fruits on yield and quality of watermelon. It consisted of twelve treatment combinations, comprising of four levels of fruit retention *viz.*, 2 fruits/plant (F₁), 3 fruits/plant (F₂), 4 fruits/plant (F₃) and control (All fruits were retained) (F₄) were embedded in a Split Plot Design in CRD with four replications. The experiment result were highest average fruit weight (2.57 kg), yield tons per hectare (45.27 t/ha), maximum pulp weight (1706.56 g), total soluble solids (11.18 °B), non-reducing sugars (3.95 %), reducing sugars (1.70 %), total sugars (5.29 %) and ascorbic acid content (7.86 mg/100 g pulp) was found in case of F₂ (3 fruits per plant). While, maximum fruit length (21.29 cm), fruit girth (13.84 cm) and lowest rag weight (612.66 g) was observed in case of F₁ (2 fruits per plant). Whereas, maximum fruit yield in terms of kg per plot (36.76 kg) and number of fruits per plot (18.66) was recorded in case of F₃ (4 fruits per plant).

KEY WORDS : Watermelon, Retention, Yield, Quality, Retention of fruits, Mulch

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Watermelon (*Citrullus lanatus* Thunb.) also known as *Tarbuji*, *Tarmuj*, *Kalinga* and *Kalindi* is one of the important vegetable crops grown extensively in India and in tropical and sub tropical countries of Europe and Africa. Though it can be grown in garden land, it is a major river-bed crop of Uttar Pradesh, Rajasthan, Gujarat, Maharashtra and Andhra Pradesh. As a common summer season crop, it is grown from the lower Himalayan region to southern parts of India. Punjab, Haryana, Karnataka, Assam, West Bengal, Orissa, Himachal Pradesh, Uttar Pradesh, Tamil Nadu and Rajasthan being major watermelon growing states. It is a popular dessert vegetable, with year round availability. Watermelon is believed to have originated from indigenous tropical Africa. Its growth is favoured by long period of warm, dry weather. A temperature of

25°C to 30°C is ideal for growth and 25°C is the best temperature for fruit setting of watermelon. Environment significantly influences the flavour and sweetness of watermelon. Farmers of Saurashtra region are cultivating watermelon in field as well as river bed on large scale but don't have idea regarding the retention of fruits *i.e.* how many fruits are to be kept per plant for better yield and quality produce. As well as the research work regarding the retention of fruits has not been carried out till the present day in Indian conditions. Mulching in general is a beneficial practice for crop production. Mulch conserves soil moisture, retends heat as well as it suppresses weed growth.

RESEARCH METHODS

The present investigation was carried out during

late *Kharif* season in polyhouse at Hi-tech Horticulture Park, Department of Horticulture, Junagadh Agricultural University, Junagadh. The farmyard manure applied at the rate of 20 tonnes per hectare, was mixed in soil during the last harrowing. The fertilizers were applied at the rate of 125:62:62 NPK kg/ha, respectively. The seeds were sown on 10th August 2010. Single seed of variety 'Kiran' was dibbled in row per hill at a distance mentioned in treatment between row and plant, respectively in which silver on black plastic mulch with 25 micron thickness was used. It consisted of twelve treatment combinations, comprising of four levels of fruit retention *viz.*, 2 fruits/plant (F₁), 3 fruits/plant (F₂), 4 fruits/plant (F₃) and Control (All fruits were allowed to grow F₄) were embedded in a Split Plot Design in CRD with four replications. Size of gross plot was 3.20 m x 0.60 m and size of net plot was 1.60 m x 0.30 m after carrying out the layout as per the standard technique of design. The whole quantity of P₂O₅ and K₂O as basal dose was given in form of single super phosphate and murate of potash, respectively. Half quantity of nitrogen in the form of urea was applied as basal dose and remaining half nitrogen as top dressing after 30 days of sowing.

Standard agronomic practices were followed throughout the study. The data on yield attributing characters *i.e.*, fruit length (cm), fruit girth (cm), average fruit weight (kg), fruit yield kg per plot, number of fruits per plot and fruit yield tons per hectare and quality attributing characters *i.e.*, pulp weight (g), rag weight (g), pulp/rag ratio, total soluble solids (%), non-reducing sugar (%), reducing sugars (%), total sugars (%) and ascorbic acid (mg/100g of pulp), respectively were statistically analyzed as per the methods. The methods described by Rangana (1979) were adopted for determining reducing sugars (%), total sugars (%) and ascorbic acid (mg/100g of pulp).

The data of all characters were studied subjected to statistical analysis of variance technique as described

by Panse and Sukhatme (1967). The treatment differences were tested by "F" test of significance on the basis of null hypothesis. The appropriate standard error of mean (S.Em.) was calculated in each case and the critical difference (C.D.) at one and five per cent level of probability was worked out to compare the two treatments means where the treatment effects were significant.

RESEARCH FINDINGS AND DISCUSSION

The findings of the present study as well as relevant discussion have been presented under following heads :

Yield of watermelon :

The results depicted in Table 1 indicated that the levels of retention of fruits were found significant on fruit length, girth, weight, yield (kg/plot), number of fruits per plot and yield (t/ha). Maximum fruit length and fruit girth was recorded in treatment F₁ (2 fruits per plant) *i.e.* 21.29 cm and 13.84 cm, respectively. Maximum average fruit weight was recorded in treatment F₂ (3 fruits per plant) 2.57 kg. Maximum yield (kg/plot) and number of fruits per plot were recorded in treatment F₃ (4 fruits per plant) *i.e.* 36.76 kg and 18.66, respectively while maximum yield (t/ha) was recorded in treatment F₂ (3 fruits per plant) 45.27 t/ha.

Minimum fruit length and fruit girth were recorded in treatment F₃ (4 fruits per plant) *i.e.* 20.12 cm and 13.08 cm, respectively. The reason for the decrease in the size of fruit might be due to the more number of fruits on plant which resulted in the poor development of the fruits. While minimum average fruit weight was recorded in control treatment F₄ *i.e.* 2.292 kg. Least number of fruits per plot and lowest yield kg/plot were recorded in treatment F₁ (2 fruits per plant) *i.e.* 9.33 and 19.66kg, respectively. This was mainly because of the treatments which had restriction on the retention of fruits. Lowest yield (t/ha) was recorded in control treatment

Table 1 : Effect of retention of fruits on yield of watermelon (*Citrullus lanatus* Thunb.)

Retention of fruit levels	Fruit length (cm)	Fruit girth (cm)	Average fruit weight (kg)	Yield (kg/plot)	No. of fruits per plot	Yield (t/ha)
F ₁ : 2 Fruits per plant	21.29	13.84	2.340	19.66	9.33	44.03
F ₂ : 3 Fruits per plant	21.08	13.70	2.570	29.88	14.00	45.27
F ₃ : 4 Fruits per plant	20.12	13.08	2.297	36.76	18.66	42.43
F ₄ : Control	20.31	13.20	2.292	28.45	14.45	41.23
S.E. ±	0.31	0.20	0.07	0.21	0.15	0.91
C.D. (P=0.05)	0.89	0.58	0.20	0.82	0.58	2.64

Table 2 : Effect of retention of fruits on quality of watermelon (*Citrullus lanatus* Thunb.)

Retention of fruit levels	Pulp weight (g)	Rag weight (g)	Pulp/rag ratio	Total soluble solids (°B)	Non-reducing sugar (%)	Reducing sugar (%)	Total sugars (%)	Ascorbic acid (mg/100g pulp)
F ₁ : 2 Fruits per plant	1640.17	612.66	43.37	10.80	3.60	1.69	5.19	7.74
F ₂ : 3 Fruits per plant	1706.56	641.10	41.96	11.18	3.95	1.70	5.29	7.86
F ₃ : 4 Fruits per plant	1585.48	704.35	42.02	10.47	3.60	1.65	5.02	6.95
F ₄ : Control	1490.00	736.33	42.08	10.63	3.25	1.59	4.99	6.35
S.E. ±	41.14	23.45	0.66	0.17	0.15	0.028	0.07	0.31
C.D. (P=0.05)	161.21	92.24	NS	0.49	0.58	0.10	0.20	0.90

NS=Non-significant

F₄ *i.e.* 41.23 t/ha. Similar result had also been found by Jani and Cito (2001).

Quality of watermelon :

The data presented in Table 2 revealed the quality of watermelon as influenced by different levels of retention of fruits. The results revealed that the different levels were found significant on pulp weight, rag weight, total soluble solids, non-reducing and reducing sugars, total sugars and ascorbic acid content (mg/100g pulp). The maximum pulp weight was recorded in treatment F₂ (3 fruits per plant) *i.e.* 1706.56 g whereas the lowest rag weight was found in treatment F₁ (2 fruits per plant) *i.e.* 612.66 g. Significantly highest ascorbic acid content 7.86 mg/100g pulp and total soluble solids 11.18 °B were recorded in the fruits of the treatment F₂ (3 fruits per plant). While highest non-reducing %, reducing sugar % and total sugar % content were recorded in treatment F₂ (3 fruits per plant) *i.e.* 3.95 %, 1.70 % and 5.29%, respectively.

Whereas, the minimum pulp weight and the maximum rag weight were recorded in control treatment F₄ *i.e.* 1490.00 g and 736.33 g, respectively. Significantly lowest ascorbic acid content 6.35 mg/100g pulp was

recorded in the control treatment F₄ while the total soluble solids content 10.47 °B was recorded in the fruits of the treatment F₃ (4 fruits per plant). While lowest non-reducing %, reducing sugar % and total sugar % content were recorded in control treatment F₄ (all fruit were allowed to grow) *i.e.* 3.25 %, 1.59 % and 4.99%, respectively. No evidence was found for the above discussed characters.

Conclusion :

Foregoing results suggest that for growing watermelon in Saurashtra region retaining 3 fruits per vine is the most beneficial practice for obtaining higher yield of watermelon with superior quality marketable fruits.

REFERENCES

- Jani, S. and Cito, V. (2001).** The effect of plant trimming on netted melons (*Cucumis melo* L.) production, grown under plastic tunnels. *Acta-Hort.*, **559** : 73-77.
- Panse, V.G. and Sukhatme, P.V. (1967).** *Statistical methods for agricultural workers*, I.C.A.R. Pub., New Delhi., 369 pp.
- Ranganna, S. (1979).** *Manual of analysis of fruits and vegetables*. Tata MC Graw Hill Pub. Co. Ltd., New Delhi.

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