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Research Article

EFFECT OF DIFFERENT SHADENET ON GROWTH, FLOWERING, YIELD AND QUALITY OF MUSKMELON (*Cucumis melo* L.) CV. GMM3

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Abstract: A field experiment entitled "Effect of different shadenet on growth, flowering, yield and quality of muskmelon (*Cucumis melo* L.) *cv.* GMM 3" was carried out during summer-2017 at College of Horticulture, Sardarkrushinagar Dantiwada Agricultural University, Jagudan (Gujarat). In this investigation of comprising of two different growing conditions *viz.* 50 percent green shadenet and 50 percent white shadenet were tested in the Randomized Block Design with three replications. Treatments were evaluated on the basis of growth, flowering, yield and quality characteristics of muskmelon. The 50 percent white shadenet reported maximum vine length at 30 and 60 DAS, number of branches per plant and leaf area at 45 DAS, minimum male flower per plant, maximum female flower, percent fruit set and sex ratio, minimum days taken for initiation of flowering, yield attributes *viz*., number of fruits per plant, average weight of fruit, yield per plant, yield per meter square, minimum days taken from fruit set to edible maturity and also the quality parameters *viz*., TSS (°Brix), diameter of fruit, thickness of pulp and minimum diameter of seed cavity.

Keywords: *Growth, Muskmelon, Shadenet Quality and Yield*

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Introduction

Muskmelon (*Cucumis melo* L.) is a vine crop belongs to the family Cucurbitaceae. It has great importance due to its short duration and high production potential as well as high nutritive value. Net house provides one of the feasible solutions for raising vegetables with improved crop productivity [1]. Further, in the harsh summer or in the late kharif season, net house technology to grow the short duration vegetable crops may be a tool to increase the yield. Protected cultivation is a total concept of modifying the natural environment for optimum plant growth [2]. It comprises of manipulation of environmental factors to some extent to control the crop growth. In the present scenario of liberalized economic policy and export incentives by the central and state Governments, there are ample opportunities for net house technology to make significant contribution to the sustainability of crop production especially short duration vegetable crops. Therefore, vegetable production under low cost net house technology is one of effective alternatives to use the land and other resources more efficiently. Looking to the potential of net house technology, muskmelon was grown under it, for working out feasibility and compatibility of crop and structure.

Material and Methods

A field experiment entitled was carried out during summer-2017 at College of Horticulture, Sardarkrushinagar Dantiwada Agricultural University, Jagudan (Gujarat). The two-growing condition with two levels *viz*. 50 percent green shade net and 50 percent white shade net were experimented for muskmelon cv. GMM3. Both the growing conditions were evaluated on the basis of growth (vine length, number of sub-vine and Leaf area), flowering (days taken to flower initiation, number of female and male flower, sex ratio and percent fruit set), yield attributes (number of fruits per plant, average weight of fruit, yield per plant and per m^2) and quality (TSS, diameter of fruit, thickness of pulp and diameter of seed cavity).

During the crop growth period of summer-2017 maximum temperature varied from 28°C to 41°C and minimum temperature from 9°C to 25°C. The atmospheric humidity ranged from 69 to 89%. Experiment was laid out in randomized block design. For recording the data on various parameters, five plants were randomly tagged in net plot. Collected data were subjected to statistical analysis using the technique of [3].

Results and Discussion

Effect of growing conditions on growth and flowerings parameters

Data in [Table-1] showed significant difference for growth and flowering parameters between two shadenet. Significantly maximum vine length at 30 DAS (41.25cm) and at 60 DAS (233.98cm), number of branches per plant at 45 DAS *i.e.*, 3.96, leaf area at 45 DAS (610.22 cm^2), female flower per plant (26.02), sex ratio (2.14) also maximum percent fruit set (14.88) and significantly minimum days taken for flower initiation (35.04) and male flowers per plant *i.e.*, 52.35 was recorded with 50 percent white shadenet. Different growing condition affects the different growing parameters of crop and it enhances the plant height [4]. Results also collaborated with the findings of Mantur *et al*., (2007) in capsicum, Wani *et al*., (2011) in cucumber [5,6]. Maximum vine length observed in 50 percent white shadenet which favor plant growth since plants are less stressful, humidity is higher, evapotranspiration is low and light transmission is supportive [7]. Probably the white shadenet allowed favorable light spectrum as compared to green shadenet which resulted in better plant growth, Hashem *et al.* (2011) [8]. Bhatia *et al.* (2007) obtained that protected structure expedite the crop growth in raising early season of muskmelon crop for getting high profits, which is affected by the better growth parameters. Findings are in the accordance with the results of Cockshull *et al.* (1992) in tomato [9,10].

Table-1 *Effect of growing conditions on growth and flowerings parameters*

Growing condition (G)	Vine length at 30 DAS (cm)	Vine length at 60 DAS (cm)	Number of subvine at 45 DAS	Leaf area per plant at 45 DAS (cm^2)	Days taken to flower initiation	No. of male flowers per plant	No. of female flowers per plant	Sex ratio	Percent fruit set
50% green shadenet (g_1)	34.22	219.87	2.9	317.69	36.86	54.93	24.38	2.1	12.64
50% white shadenet (g_2)	41.25	233.98	3.96	610.22	35.04	52.35	26.02	2.14	14.88
S.Em.±	0.68	3.78	0.07	10.85	0.52	0.75	0.42	0.005	0.25
C.D. at 5%	1.97	10.87	0.2	31.19	1.5	2.17	1.22	0.01	0.72
C. V.%	9.46	8.66	10.9	12.16	7.55	7.33	8.79	1.26	9.56

Table-2 *Effect of growing conditions on yield, yield attributes and quality parameters*

Growing condition (G)	No. of fruits per plant	Average weight of fruit (g)	Yield per plant (kg)	Yield per m^2 (kg)	Days taken from fruit set to edible maturity	TSS (°Brix)	Diameter of fruit (cm)	Thickness of pulp (cm)	Diameter of seed cavity(cm)
50% green shadenet (g_1)	3.07	380.84	1.19	1.58	22.22	5.87	8.32	1.27	5.63
50% white shadenet (g_2)	3.8	399.64	1.47	1.95	19.94	6.04	8.56	1.36	5.49
S.Em.±	0.06	5.79	0.02	0.035	0.36	0.03	0.07	0.01	0.02
C.D. at 5%	0.19	16.66	0.07	0.13	1.05	0.1	0.21	0.03	0.07
C. V.%	10.17	7.72	10.25	10.23	9.03	3.07	4.53	4.47	2.56

In case of flowering parameters, protected structures resulted in more assimilation of photosynthates and accelerated the flower initiation, the flowers appear on every node of the vine, and therefore, increased vine length resulted in more flowering. Kumar *et al*. (2017) also observed that relatively high temperature in white shadenet favours the flowering in cucumber [11]. The difference in light intensity permeability in white and green shadenet affect on male and femaleness of lowers, similar results have been showed by Sahu *et al*. (2016) in sweet pepper [12]. Also, maximum fruit setting was might be due to that white shadenet provide required light, its intensity and favorable condition for fruit setting and fruit retention. These results are in conformity with the findings of Sandri *et al*. (2003) [13] in tomato and Abu Zahra and Mazen (2016) in cucumber.

Effect of growing conditions on yield, yield attributes and quality parameters

Data in [Table-2] showed significant difference for yield and quality parameters between two levels of growing conditions. Significantly maximum number of fruits per plant (3.80), average weight of fruit (399.64g), yield per plant (1.47kg) and per meter square (1.95kg) and earliest maturity (19.94 days) was recorded with 50 percent white shadenet. Temperature and light intensity played a significant role in plant growth and development superiority of white shadenet with respect to temperature and light management over green shadenet resulted in good vegetative growth which in term produced a greater number of fruits per plant [14]. These results are in conformity with the findings of Mousa *et al*. (2017) in summer squash. Greater fruit weight might be occurred under protected conditions because plants avoiding large gaps between plants and rows while simultaneously optimizing light interception in muskmelon [15]. Further superiority of white shadenet over green might be due to the better light interception. These results are in conformity with the findings of Fukuda and Anami (2002) in muskmelon [16]. The performance of the crop grown inside the protected structure has several beneficial roles on crop growth, yield and yield attributing characters has compared to open field conditions [17]. Above results are in conformity with that of with Tribhuvan and Borude (2010) in cucumber [18]. The increasing yield could be attributed to better growth and yield attributes which helped in better yield. These results are in conformity with the findings of Anjanappa *et al*., (2012) in cucumber [19]. Significantly maximum TSS (6.04°Brix), diameter of fruit (8.56cm), thickness of pulp (1.36cm) and minimum diameter of seed cavity (5.49 cm) was recorded in fruits grown under 50 percent white shadenet whereas, minimum TSS (5.87°Brix), diameter of fruit (8.32cm), thickness of pulp (1.27cm) and maximum diameter of seed cavity (5.63cm) was observed with 50 percent green shadenet. The cultivation of vegetables in net house can play a better role in improving quality, advancing maturity, increasing fruiting span as well as fruit size in capsicum [20]. These results are in conformity with the findings Singh *et al*. (2005) in tomato, Dixit (2007) in leafy vegetables [21,22]. Under protected conditions due to high light, high humidity, high soil moisture and temperature gives the better performance of quality parameters. These findings are corroborated with the findings of Vidyadhar *et al*. (2014) [23] in tomato and Abu-zahra and Mazen (2016) in cucumber.

Conclusion

It can be concluded that to obtain better growth, flowering, yield and quality of muskmelon, it can be grown under 50 percent white shade net condition.

Application of research: Study of different shadenet on growth, flowering, yield and quality of muskmelon (*Cucumis melo* L.) cv. GMM 3

Research Category: Vegetable Science

Abbreviations: DAS: Days after sowing, TSS: Total soluble solids

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Study area / Sample Collection: College of Horticulture, Jagudan, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, 385506, Gujarat

Cultivar / Variety name: *Cucumis melo* L. *cv.* GMM3

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

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