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Studies on effect of coloured shade nets on growth of Peace lily (*Spathiphyllum wallisii*)

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Abstract
The present investigation was carried out to study the effect of coloured shade nets on growth of peace lily (*Spathiphyllum wallisii*). The experiment was conducted at college of Horticulture, Venkataramannagudem during 2021-22 with four replications in Completely Randomized Design. In this experiment four different coloured shading nets (red, black, white and green) with shading intensity of 50% and control (under tree shade) were used. In all these coloured shadenets performance of spathiphyllum was studied for a period of 135 days. Plant growth parameters were observed at various stages (45, 90 and 135 DAP). Vegetative parameters like plant height, plant spread, number of leaves, leaf thickness, leaf length, leaf width, leaf area, dry weight of leaf, specific leaf area, petiole length and petiole girth were recorded maximum in plants grown under black shade net at all intervals followed by those grown under red shade net.

Keywords: *Spathiphyllum wallisii*, vegetative parameters, coloured shade nets, ornamental plants

Introduction
Landscaping has become an important element to beautify the surroundings and also enhance physical and mental conditions of people. Hence the interest for indoor ornamental plants and air purifying houseplants has been increasing. These house plants can effectively improve the indoor air by reducing volatile organic compounds such as formaldehyde, benzene, toluene, ethylene and xylene. Spathiphyllum is indigenous to tropical regions of Central America and belongs to the family Araceae. In Florida foliage plant industry, it is one of the dominant selling plants. It is commonly known as Dwarf peace lily, White sails and spathe flower and used as specimen, mass planting and potted plants in ornamental industry. Spathiphyllum has emerged to be one of the most popular foliage-plant bearing beautiful dark green foliage along with white flowers. NASA has identified this plant for its capacity to alleviate the effect of formaldehyde, carbon monoxide and benzene from indoor air (Chen *et al*., 2003) [3].
Coloured shade nets approach in protected cultivation has already been investigated in certain vegetables, ornamentals and fruit crops. The responses of various ornamental plants to changes in light quality includes extension of the internodes of chrysanthemums cultivated under blue nets and maximum petiole length and leaf area in Anthurium grown under black shading cloths (Lima *et al*., 2010) [9]. The Systematic knowledge regarding use of coloured shade nets for cultivation of ornamental potted plants is very confined which warrants need for scientific study on use of coloured shade nets in cultivation of ornamental plants. Therefore, the present study was carried out with the objective of evaluating the growth performance of Spathiphyllum grown under different coloured shade nets.

Material and Methods
The experiment was laid out in a Completely Randomized Design with four replications in each colour shade nets (black, white, red, green), and control (Tree shade). The potting media was prepared by mixing 1:1 ratio of soil and FYM. The prepared media was filled into polybags of 12 inches and plants of four leaves stage were transplanted in polybags on 20th December, 2021. Total plants per replication were ten. Observations for plant height, plant spread, number of leaves, leaf thickness, leaf length, leaf width, leaf area, leaf dry weight, specific leaf area, petiole length and petiole girth were recorded at 45, 90 and 135 DAP.

Results and Discussion

Plant height (cm)

The data regarding plant height due to the influence of coloured shade nets is presented in Table 1. The mean plant height was found to increase from 26.28 cm at 45 DAP to 39.51 cm at 135 DAP. It was observed that plants grown under black coloured shade net recorded significantly maximum plant height (28.85 cm) at 45 days after planting followed by those grown under red shade net (26.75 cm). The plants grown under white coloured shade net recorded lowest plant height (24.17 cm). Similar trend was obtained at 90 days after planting. At 135 DAP plants grown under black coloured shade net recorded the highest plant height (48.65 cm) followed by those under red and green coloured shade nets (45.85 cm and 36.17 cm). The lowest plant height was recorded with plants grown under white coloured shade net (31.88 cm).

From the above data, it was clear that plants grown under black coloured shade nets recorded maximum plant height. Due to low temperature and high humidity under black shade net there was a congenial environment for maximum cell division activity in shoot apical meristem which in terms increases plant height in addition it also might be due better auxin transport in plants under low light condition as earlier reported by). The results are in agreement with Stamps and Chandler (2008) [12] who stated that plant height was maximum in under black coloured shade net in aspidistra. Myrthong and Sudhadevi (2016) also reported maximum plant height in *Nephrolepis exaltata* and *Asparagus densiflorus*.

Plant spread (cm)

The data regarding the plants grown under colour shade nets in respect of plant spread was presented in Table 1. The differences noticed among the plants grown under coloured shade nets were tested significant at 45 and 135 DAP but at intermediate period (90 DAP) the plant spread was found non-significant. The mean plant spread was found to increase from 33.67 cm - 37.18 cm at 45 DAP to 43.28 cm - 43.88 cm at 135 DAP.

The plants grown under black coloured shade net (34.7 cm-38.55 cm) recorded maximum spread in both direction (NS-EW) at 45 DAP. Minimum plant spread was recorded in plants grown under white coloured shade net (33.05 cm-36.10 cm). However, at 90 days after planting non-significant differences were observed among plants grown under coloured shade nets. However, the plants spread significantly varied when observed at 135DAP. At DAP, the highest plant spread was recorded with plants grown under black coloured shade net (51.80cm-51.55cm) followed by those grown under red and green shade nets (42.70 cm-43.00 cm and 41.30 cm-42.00 cm). Minimum plant spread was recorded in plants grown under white shade net (40.10cm- 41.15cm).

The data revealed that plants grown under black shade net recorded maximum plant spread in both direction. This increase in plant spread under black coloured shade net might be due to production of more number of leaves per plant as well as increase in leaf size i.e leaf length and leaf width. The results are in accordance with the findings of Myrthong and Sudhadevi (2016) who reported that black coloured shade net positively influenced plant spread in *Nephrolepis exaltata* and *Asparagus densiflorus*. Stamps and Chandler (2008) [12] also observed that plant spread was maximum in aspidistra grown under black shade net.

Number of leaves per plant

The results recorded on number of leaves per plant due to different coloured shade net are presented in Table 2. The mean number of leaves per plant was found to increase from 10.99 at 45 DAP to 20.23 at 135 DAP.

A perusal of data on number of leaves per plant was significantly differed under the influence of coloured shade net. It was noticed that maximum number of leaves per plant was observed in plants grown under black coloured shade net (11.95) at 45 DAP followed by those grown under red coloured shade net (11.10). The lowest number of leaves per plants was recorded in plants grown under white shade net (10.25). At 90 DAP, the highest number of leaves per plant was recorded in plants grown under black coloured shade net (21.45) followed by those under red and green shade nets (19.60 and 14.55). Minimum number of leaves per plant was recorded in plants grown under white coloured shade net (12.75). At 135 days after planting maximum number of leaves per plant was recorded in plants grown under black coloured shade net (27.90) followed by those grown under red and green shade nets (25.40 and 17.60). The lowest number of leaves per plant was recorded in plants grown under white shade net (16.00).

From the above results, it was confirmed that maximum number of leaves per plant was found in plants grown under black coloured shade net. As black colured shade net provide favourable condition for mitotic activity, there is formation of more new cells which in terms increases production of maximum number of leaves per plant. Similar results were obtained by Stamps and Chandler (2008) [12] who reported that more number of harvestable leaves was produced in *Aspidistra elatior* plants grown under black coloured shade net. Chen *et al.* (1999) [2] also stated that in Anthurium number of leaves increased with reduction in quantum of light.

Leaf thickness (mm)

The data related to leaf thickness is presented in Table 2. Leaf thickness differed significantly due to the influence of coloured shade nets. The mean leaf thickness was found to increase from 0.35 mm at 45 DAP to 0.38 mm at 135 DAP. It was observed that leaf thickness recorded maximum in plants grown under black coloured shade net (0.42 mm) during 45 DAP on par with those under red and green shade nets (0.41 mm and 0.36 mm). The least leaf thickness was found in plants grown under tree shade (0.25 mm). Similar trend was noticed at 90DAP. At 135 DAP, the plants grown under red shade net recorded highest leaf thickness (0.45 mm) followed by those under green and black coloured shade nets (0.39 mm and 0.37 mm). Maximum leaf thickness was recorded in plants grown under tree shade (0.32 mm).

It is evident from the above data the leaf thickness was recorded maximum in plants grown under black coloured shade nets. This might be due to more photosynthetically active radiation under black coloured shade net leads to increase in photosynthetic rate and this leads to more accumulation of dry matter in leaves leads to an increase in leaf thickness in plants grown under black coloured shade net. These observations are similar to the findings of stamps and Chandler (2008) [12] who stated that leaf growth was maximum under black coloured shade net in aspidistra.

Leaf length (cm)

The data on leaf length due to the influence of coloured shade net are presented in Table 3. There were significant differences among the values of leaf length at 45 and 90 DAP. However at 135 DAP, the differences in leaf length were found non-significant. The mean leaf length was recorded an increase from 16.97 cm at 45 DAP to 20.82 cm at 135 DAP.

The highest leaf length was recorded in plants grown under black coloured shade net (18.00 cm) at 45 DAP followed by those grown under red coloured shade net (17.23 cm). Minimum leaf length was reported in plants grown under white coloured shade net (16.35 cm). At 90 DAP, the plants grown under black coloured shade net was found to have maximum leaf length (22.84 cm) followed by those grown under red coloured shade net (20.94 cm). The lowest leaf length was recorded in plants grown under white coloured shade net (17.66 cm). At 135 DAP, non–significant differences were observed in leaf length of plants grown under coloured shade nets.

Leaf width (cm)

The results on leaf width as presented in Table 3 revealed that plants grown under coloured shade nets caused significant differences at various stages. The mean leaf width was found to increase from 6.82 cm at 45 DAP to 8.78 cm at 135 DAP. It was noticed that the plants grown under black coloured shade net recorded maximum leaf width (7.51 cm) at 45 DAP on par with those under red coloured shade net (7.45 cm). Minimum leaf width was recorded in plants grown under white shade net (6.00 cm). At 90 DAP, maximum leaf width was observed in plants grown under black coloured shade net (9.91 cm) followed by those grown under red coloured shade net (9.45 cm). The least leaf width was recorded in plants grown under white shade net (6.63 cm). At 135 DAP, the highest leaf width was recorded in plants under black coloured shade net (11.83 cm) followed by plants under red and green coloured shade nets (10.12 cm and 8.02 cm). Minimum leaf width was observed in plants grown under white coloured shade net (7.08 cm).

It was evident from the data that among plants under coloured shade nets, maximum leaf length and leaf width was recorded in plants grown under black coloured shade net. This increase in leaf size in plants grown under black shade net is might be due to increase in cell division and cell number under low temperature and high humidity conditions. The results were in agreement with the findings of Retamales *et al*. (2008) [11] who reported that there was a reduction in photo synthetically active radiation (PAR) by 47% to 54% under black shade net house. Such a reduction was associated with an increase in leaf size i.e. length and width in high bush blueberry cultivars. Agasimani *et al*. (2011) [1] also stated that Anthurium leaf length and leaf width was significantly superior under densely shaded conditions.

Leaf area (cm^2)

The data pertaining to leaf area due to coloured shade nets is presented in Table 4. The differences in leaf area were tested significant under the influence of coloured shade nets. The mean leaf area was found to increase from 788.61 cm^2 at 45 DAP to 2405.75 cm^2 at 135 DAP. At 45 DAP, maximum leaf area was recorded in plants grown under black coloured shade net (932.35 cm^2) followed by those grown under red and green shade nets (832.52 cm^2 and 733.23 cm^2). The lowest leaf area was recorded in plants grown under white shade net (723.99 cm^2). At 90 DAP, the highest leaf area was recorded in plants grown under black shade net (3224.64 cm^2) followed by those grown under red and green shade nets (2639.32 cm^2 and 1493.96 cm^2). Minimum leaf area was registered in plants grown under white coloured shade net (1020.88 cm^2). At 135 DAP, the maximum leaf area was recorded in plants grown under black coloured shade net (4301.73 cm^2) followed by those grown under red and green shade net (3632.60 cm^2 and 1823.52 cm^2). The least leaf area was observed in plants grown under white shade net (1117.79 cm^2).

Analysis of data showed that among the plants grown under coloured shade nets, the maximum leaf area was observed in plants grown under black coloured shade net. These variations in leaf area might be attributed to variations in light intensities under different coloured shade nets. This was most likely the result of cell expansion to compensate for lower light under shading environment to receive more light for photosynthesis. Similar results were obtained by Nomura *et al*. (2009) [10] who observed that black screens were more efficient in promoting the development of leaf tissue in Anthurium. Da Silva *et al*. (2017) reported that the plants grown under black screens recorded the highest leaf area.

Leaf dry weight (g)

The data related to leaf dry weight in peace lily due to the influence of coloured shade net is presented in Table 4. Leaf dry weight exhibited significant differences among the plants grown under different coloured shade nets. The mean leaf dry weight was found to increase from 0.32 g at 45 DAP to 0.42 g at 135 DAP.

It was observed that plants grown under black coloured shade net recorded highest leaf dry weight (0.36 g) at 45 DAP followed by those grown under red shade net (0.33 g). The lowest leaf dry weight was reported in plants grown under white coloured shade net (0.29 g). At 90 DAP, maximum leaf dry weight was recorded in plants grown under black coloured shade net (0.43 g) followed by those grown under red coloured shade net (0.40 g). The lowest leaf dry weight was observed in plants grown under white coloured shade net (0.33 g). At 135 DAP, the plants grown under black coloured shade net recorded maximum leaf dry weight (0.49g) followed by those grown under red and green shade net (0.45g and 0.41g). Minimum leaf dry weight was recorded in plants grown under white shade net (0.36g).

The results confirmed that plants under different coloured shade net showed a significant effect on leaf dry weight. PAR is more under black shade net which leads to increase in photosynthetic rate this might cause more dry matter accumulation in leaves which denote that maximum leaf dry weight was recorded in plants under black coloured shade net. These results are in conformity with the findings of Stamps (2009) who stated that bell pepper leaf and stem morphological and physiological adaptations in response to shade. Diaz-Perez (2013) also reported that leaf dry weight increase for the plant that grown under shade net compared to control (no shading).

Specific leaf area (cm^2/g)

The data pertaining to SLA in plants grown under coloured shade nets is presented in Table 4. The difference was observed among the peace lily plants grown under coloured shade nets were found to be significant for SLA at 90 and 135

DAP. The mean SLA was found to increase from 224.47 cm^2/g at 45 DAP to 280.92 cm^2/g at 135 DAP. At 45 DAP, the difference in SLA were tested non-significant. At 90 DAP, the plants grown under black shade net recorded maximum SLA (319.38 cm^2/g) followed by those grown under red shade net (298.45 cm^2/g). The lowest SLA was reported in plants grown under white shade net (171.30 cm^2/g). At 135 DAP, the highest value of SLA (355.54 cm^2/g) was recorded in plants grown under black coloured shade net followed by those grown under red coloured shade net (316.16 cm^2/g). Minimum SLA was recorded in plants grown under white shade net (201.76 cm^2/g)

From the above findings the maximum SLA in plants under black coloured shade net is due to increase in both leaf area and dry weight of leaf in plants under same coloured shade net. Similar results were attained by Gaurav *et al*. (2016) [8] who reported that SLA was highest under black shade net.

Petiole length (cm)

The data pertaining to petiole length as influenced by coloured shade nets as presented in Table 5. It is that revealed there was a significant difference with respect to petiole length in peace lily. The mean petiole length was found to increase from 12.28 cm at 45 DAP to 18.79 cm at 135 DAP.

Maximum petiole length was recorded in plants grown under black coloured shade net (13.28 cm) at 45 DAP followed by those grown red and green shade net (12.66 cm and 11.96 cm). The least petiole length was recorded in plants grown under white shade net (11.71 cm). At 90 DAP, the plants grown under black coloured shade net was recorded highest petiole length (16.85 cm) on par with those grown under red coloured shade net (16.52 cm). Minimum petiole length was recorded in plants grown under white shade net (12.48 cm). At 135 DAP, the highest petiole length (26.77 cm) was observed in plants grown under black shade net followed by those grown under red and green coloured shade net (22.98 cm and 17.12 cm). Minimum petiole length was recorded in plants grown under white shade net (13.48 cm).

The above data indicates that among plants grown under coloured shade nets, the highest petiole length was recorded in plants grown under black coloured shade net. The maximum petiole length might be due to increase in cell number, as well as cell elongation induces to increase the petiole length under low light conditions which was recorded in black shade net. The results were in agreement with the findings of Tsukaya *et al*. (2002) who reported that *Arabidopsis thaliana* petiole length increased in low light condition. However, growth of petiole length is liable to R: FR light in low light conditions which tells about phytochrome. Coloured shade nets were designed to manipulate plant growth and development by affecting the numerous photoreceptors in sweet pepper plants (Folta and Maruhnich, 2007) [7].

Petiole length (cm)

The data pertaining to petiole length as influenced by coloured shade nets as presented in Table 4.8. It is that revealed there was significant differences with respect to petiole length in peace lily. The mean petiole length was found to increase from 12.28 cm at 45 DAP to 18.79 cm at 135 DAP.

Maximum petiole length was recorded in plants grown under black coloured shade net (13.28 cm) at 45 DAP followed by those grown red and green shade net (12.66 cm and 11.96 cm). The least petiole length was recorded in plants grown under white shade net (11.71 cm) which was on par with tree shade (11.82 cm). At 90 DAP, the plants grown under black coloured shade net was recorded highest petiole length (16.85 cm) on par with those grown under red coloured shade net (16.52 cm). Minimum petiole length was recorded in plants grown under white shade net (12.48 cm) on par with those grown under tree shade (12.96 cm). At 135 DAP, the highest petiole length (26.77 cm) was observed in plants grown under black shade net followed by those grown under red and green coloured shade net (22.98 cm and 17.12 cm). Minimum petiole length was recorded in plants grown under white shade net (13.48 cm) which was on par with those under tree shade (13.63 cm).

The above data indicates that among plants grown under coloured shade nets, the highest petiole length was recorded in plants grown under black coloured shade net. The maximum petiole length might be due to increase in cell number, as well as cell elongation induces to increase the petiole length under low light conditions which was recorded in black shade net. The results were in agreement with the findings of Tsukaya *et al*. (2002) who reported that *Arabidopsis thaliana* petiole length increased in low light condition. However, growth of petiole length is liable to R: FR light in low light conditions which tells about phytochrome. In order to shade prevention, phytochrome B induces the petiole length in low light conditions (Franklin and Whitelam 2005; Robson *et al*. 1993). Coloured shade nets were designed to manipulate plant growth and development by affecting the numerous photoreceptors in sweet pepper plants (Folta and Maruhnich, 2007) [7].

Petiole girth (mm)

The data recorded on petiole girth is represented in Table 4.8. The plants grown under coloured shade nets exhibited significant differences in the petiole girth (Table 4.8). The mean petiole girth was found to increase from 3.35 cm at 45 DAP to 4.40 cm at 135 DAP. The highest petiole girth was recorded in plants grown under black coloured shade net (3.85 mm) at 45 DAP followed by those grown under red shade net (3.44 mm). Minimum petiole girth was reported in plants grown under white shade net (2.94 mm) on par with those grown under tree shade (3.22 mm). At 90 DAP, the plants grown under black coloured shade net recorded maximum petiole girth (4.28 mm) on par with those grown under red coloured shade net (4.15 mm). The least petiole girth was observed in plants grown under white shade net (3.50 mm) which was on par with those under tree shade (3.56 mm). At 135 DAP, maximum petiole girth was registered in plants grown under black coloured shade net (5.05 mm) followed by those grown under red shade net (4.72 mm). The lowest petiole girth was recorded in plants grown under white coloured shade net (3.83 mm) on par with those under tree shade (3.87 mm).

The results confirmed that maximum petiole girth was found in plants grown under black coloured shade net. These results were in conformity with the findings of Myrthong and Sudhadevi (2016) who stated that the petiole girth was highest under black coloured shade net in *Asparagus densiflorus.* Chowdhuri *et al*. (2021) [4] also reported that maximum petiole girth in Asparagus was found under black and green shade net.

Table 1: Plant height and plant spread as influenced by coloured shade nets.

Coloured shade nets	Plant height (cm)			Plant spread NS (cm)			Plant spread EW (cm)		
	45 DAP	90 DAP	135 DAP	45 DAP	90 DAP	135 DAP	45 DAP	90 DAP	135 DAP
Red	26.75	35.27	45.85	33.75	40.50	42.70	37.60	44.50	43.00
Black	28.85	39.28	48.65	34.75	43.95	51.80	38.55	55.75	51.55
White	24.17	30.20	31.88	33.05	39.05	40.10	36.10	40.30	41.15
Green	26.47	33.35	36.17	33.55	39.55	41.30	37.10	40.75	42.00
Tree shade	25.14	33.05	35.00	33.25	39.15	40.50	36.55	40.50	41.70
Mean	26.28	34.23	39.51	33.67	40.44	43.28	37.18	44.36	43.88
S.Em+	0.62	0.69	0.58	0.36	0.91	0.70	0.52	6.85	0.70
CD at 5%	1.89	2.11	1.77	1.10	2.78	2.12	1.59	NS	2.12

Table 2: Number of leaves and leaf thickness as influenced by coloured shade nets.

Coloured shade net	No. of leaves per plant			Leaf thickness (mm)		
	45 DAP	90 DAP	135 DAP	45 DAP	90 DAP	135 DAP
Red	11.10	19.60	25.40	0.39	0.39	0.41
Black	11.95	21.45	27.90	0.42	0.42	0.45
White	10.25	12.75	14.25	0.25	0.31	0.32
Green	10.95	14.55	17.60	0.36	0.36	0.38
Tree shade	10.70	13.70	16.00	0.33	0.34	0.35
Mean	10.99	16.41	20.23	0.35	0.36	0.38
S.Em+	0.23	0.44	0.34	0.02	0.01	0.01
CD at 5%	0.70	1.34	1.04	0.07	0.03	0.03

Table 3: Leaf length and leaf width as influenced by coloured shade nets.

Coloured shade nets	Leaf length (cm)			Leaf width (cm)		
	45DAP	90DAP	135DAP	45DAP	90DAP	135DAP
Red	17.23	20.94	20.94	7.45	9.56	10.14
Black	18.00	22.84	25.43	7.51	9.91	11.38
White	16.39	17.66	17.98	6.00	6.63	7.08
Green	16.90	20.06	20.70	6.82	7.61	8.02
Tree shade	16.35	20.02	19.05	6.35	6.88	7.27
Mean	16.97	20.30	20.82	6.82	8.12	8.78
S.Em+	0.23	0.33	2.59	0.11	0.15	0.14
CD at 5%	0.71	0.99	NS	0.35	0.45	0.42

Table 5: Leaf area, specific leaf area and leaf dry weight as influenced by coloured shade nets

Coloured shade nets	Leaf area (cm^2)			Specific Leaf Area ($cm^2\ g^{-1}$)			Leaf dry weight (g)		
	45 DAP	90 DAP	135 DAP	45 DAP	90 DAP	135 DAP	45 DAP	90 DAP	135 DAP
Red	822.52	2639.32	3632.60	231.88	298.45	316.16	0.33	0.40	0.45
Black	932.35	3224.6	4301.73	246.37	319.38	355.54	0.36	0.43	0.49
White	723.99	1090.15	1117.79	192.50	171.30	201.76	0.29	0.33	0.36
Green	733.23	1493.96	1823.52	227.15	292.40	313.37	0.32	0.39	0.41
Tree shade	730.96	1020.88	1153.10	203.19	178.00	217.79	0.30	0.37	0.40
Mean	788.61	1893.78	2405.75	224.47	251.91	280.92	0.32	0.38	0.42
S.Em+	22.54	55.83	45.65	19.77	5.99	5.41	0.01	0.01	0.01
CD at 5%	68.56	169.83	138.86	NS	18.21	16.47	0.02	0.02	0.03

Table 6: Petiole length and petiole girth as influenced by coloured shade net.

Coloured shade nets	Petiole length (cm)			Petiole girth (mm)		
	45 DAP	90 DAP	135 DAP	45 DAP	90 DAP	135 DAP
Red	12.66	16.52	22.98	3.44	4.15	4.72
Black	13.28	16.85	26.77	3.85	4.28	5.05
White	11.71	12.48	13.48	2.94	3.50	3.83
Green	11.96	14.70	17.12	3.32	3.93	4.52
Tree shade	11.82	12.96	13.63	3.22	3.56	3.87
Mean	12.28	14.70	18.79	3.35	3.88	4.40
S.Em+	0.19	0.27	0.25	0.10	0.12	0.09
CD at 5%	0.57	0.81	0.76	0.29	0.35	0.27

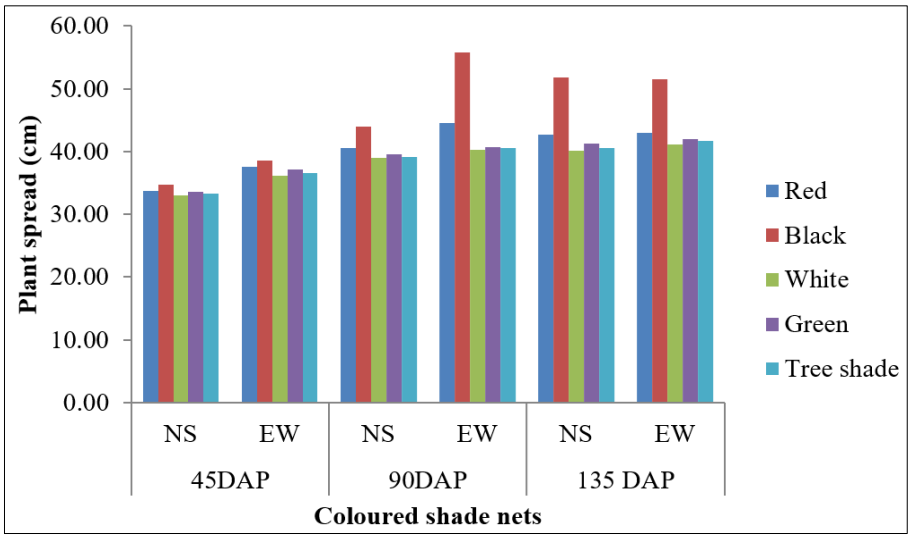

Fig 1: Plant spread as influenced by coloured shade nets in peace lily.

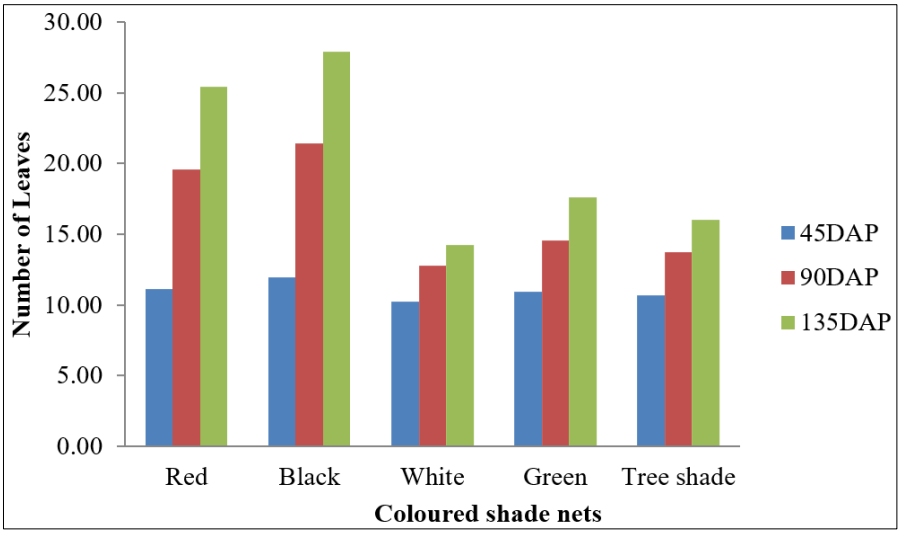

Fig 2: Number of leaves per plant as influenced by coloured shade nets.

Conclusion

The present investigation has led to certain important points to be stated as valid conclusions for the plants like used to be grown under different coloured shade net other than green net. Based on the results obtained it could be concluded that, among the plants grown under different coloured shade nets, the plants grown under black coloured shade net were superior in all growth parameters.

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