RESULTS AND DISCUSSION

IV-RESULTS AND DISCUSSION

IV-1-EXPERIMENT(1)

The effect of media under light intensity on growing H.T. roses :-

IV-1- A-Vegetative growth:-

IV-1-A- 1-Plant height (cms) :

The data in Table (1) and illustrated in Fig (1) show that control plants gave shorter plant height during the two seasons in most cases as compared to the other media.

The medium M_3, M_5 and M_6 gave significantly at 0.01 level longer plants as (35.0, 40.0, 34.9 cms) respectively as compared to control. While, M2 gave unsignificant shorter plants compared to the control during the first season. The increment in plant height resulting from M_3 and M_6 media (76.37, 74.75 cms) were highly significant during the second season compared to the control.

The plant height resulting from growing media (M_3 and M_6) gave the best increase compared to the other different media during the second season. These results perhaps are due to the soil structure which M_3 and M_6 containing more sand than the control content which permitted aeriation. In addition the increase in fertilizers cations in that media than control content. Tables (1and 2).

The effect of growing media on vegetative growth of roses grown in open field(full sunlight) are tabulated in Table(2)and illustrated in Fig (2).

There were an increment on plant height noticed with plants grown in media M_3 and M_5 (34.17, 32.57 cms). These increases reached the level of significant at 0.01 throughout the first season.

Similar increases resulted from plants grown in all different media throughout the second season.

The increases were highly significant as compared to control. Whereas more increase resulted on plant height with plants grown in the media M_3 and M_6(72.47,77.92 cms, respectively). This is in confirmity with those results of **Hussien**

(2002), who concluded that the growing of *Nerium oleander* plants in peatmoss or clay increased plant heighr. While, **Nasr (1997),** found that *Gerbera jamesonii* which grown in mixture of vermiculite + peatmoss was the most favourable planting media for increasing in florescence stem length.

IV-1-A- 2- Number of shoots / plant :-

With respect to the effect of different growing media on the number of shoots per plant, it is evident from the data presented in Table (1and 2) and illustrated in Fig (2) that the number of branches per plant at open field insignificantly increased during the first season. Meanwhile, highly significant increase resulted from plants grown in the media M_3 and M_6 as (8.20,8.75 , respectively) during the second season as compared to the control which gave 7.20.It seemed that M_3 and M_6 had the best available constituents for rose growing. Those media also contained Ca^{++} (3.06,3.72 meq/L) , Mg^{++} (0.74, 1.66 meq/L) and K^{+} (0.30,0.26 meq/L), respectively. The results agree with those obtained by **Maloup *et al* (1999),** who found that zeolilte: perlite medium produced the highest total yield and largest number of cut roses.

IV-1-A- 3- Number of leaves/ plant:-

The results presented in Table (1,2) and illustrated in Fig (1,2) clearly indicate that the growing media M_3 , M_5 and M_6 increased significantly the number of leaves per plant compared to the control.

While, M_2 and M_4 insignificant by increased the No. of leaves/ plant during the first season as compared to control under shading.

Data obtained on the effect of different growing media on the number of leaves per plant throughout the second season realized a highly significant increase with the M_2 and M_3. While, the other growing media gave insignificant increment in the number of leaves per plant as compared to the control. This is probably due to the mixture content which contain FYM as a nitrogen source which accelerated the vegetative growth. No significant increase resulted from the different media due to shading under trees. The effect was clear with M_3 ,M_4 and M_6 (1.88, 1.93, 1.93, respectively), throughout the first season.

Table (1,a) : Effect of growing media on the vegetative growth of H.T.grown under low light intensity throughout the second season (2001).

	First season		
Treatments	Plant height Cms	No. of shoots/ plant	No. of Lvs/ plant
Control	29.60	1.55	12.90
2	28.90	1.38	9.50
3	35.00	1.88	17.42
4	31.00	1.93	10.00
5	40.00	1.78	18.60
6	34.90	1.93	21.25
L.S.D at 0.05	1.67	N .S.	2.78
L.S.D at 0.01	2.29	N . S.	3.81

Table (1,b) : Effect of growing media on the vegetative growth of H.T.grown under low light intensity throughout the second season (2002).

	Second season		
Treatments	Plant height Cms	No. of shoots/ plant	No. of Lvs/ plant
Control	54.62	6.10	42.70
2	53.32	4.07	49.95
3	76.37	6.65	55.62
4	48.87	4.72	35.75
5	49.20	4.65	41.87
6	74.75	8.55	41.62
L.S.D at 0.05	5.69	0.57	4.11
L.S.D at 0.01	7.81	0.78	5.63

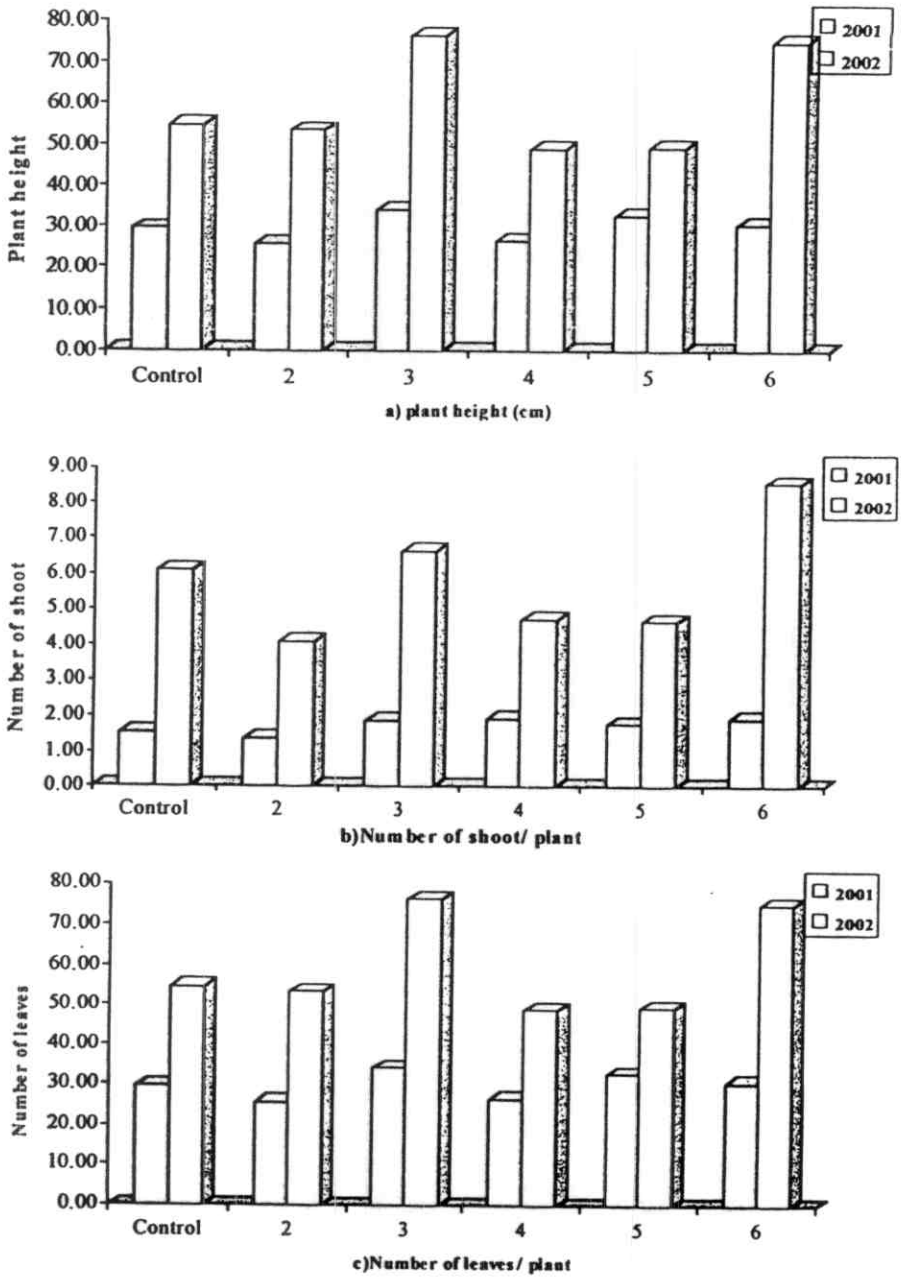


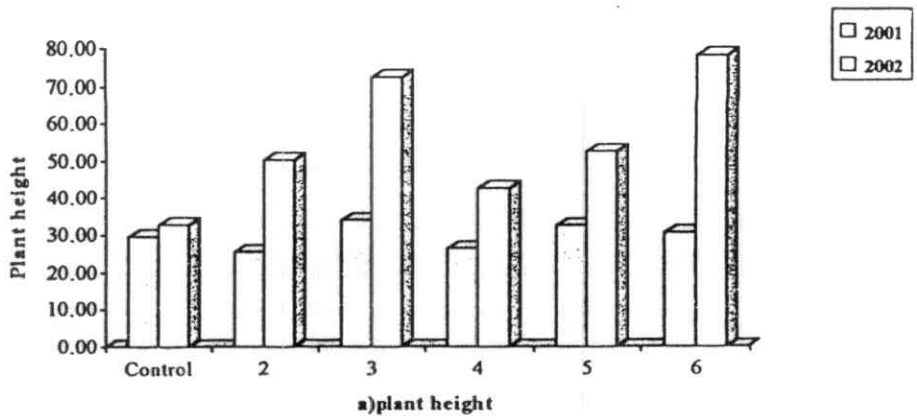
Fig (1) : Effect of growing media on the vegetative growth of H.T. roses grown under low light intensity (2001/ 2002).

Table (2,a) : Effect of growing media on the vegetative growth of H.T.grown under high light intensity throughout the second season (2001).

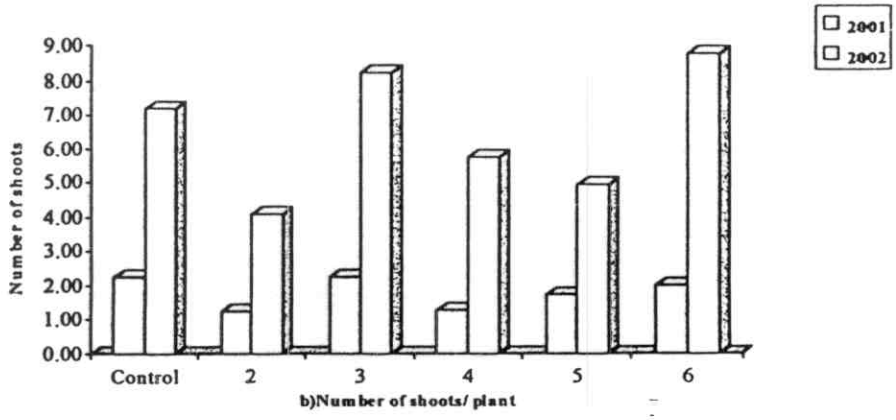
	First season		
Treatments	Plant height Cms	No. of shoots/ plant	No. of Lvs/ plant
Control	29.60	2.25	18.25
2	25.87	1.25	8.85
3	34.17	2.25	21.38
4	26.37	1.27	9.65
5	32.57	1.73	19.05
6	30.57	1.98	22.17
L.S.D at 0.05	1.43	0.51	1.71
L.S.D at 0.01	1.96	0.70	2.35

Table (2,b) : Effect of growing media on the vegetative growth of H.T.grown under high light intensity throughout the second season (2002).

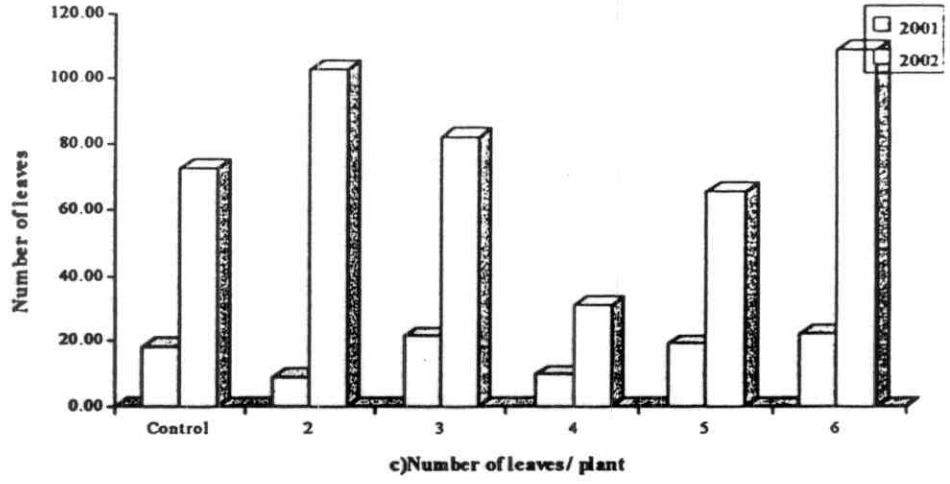
	Second season		
Treatments	Plant height Cms	No. of shoots/ plant	No. of Lvs/ plant
Control	32.82	7.20	72.80
2	50.32	4.10	102.70
3	72.47	8.20	82.00
4	42.80	5.72	31.00
5	52.50	4.90	65.25
6	77.92	8.75	108.50
L.S.D at 0.05	5.37	0.74	6.00
L.S.D at 0.01	7.35	1.02	8.23



a)plant height



b)Number of shoots/ plant



c)Number of leaves/ plant

Fig (2) : Effect of growing media on the vegetative growth of H.T. roses grown under high light intensity (2001/ 2002).

Meanwhile, a significant increase in the number of shoots / plant resulted from plants grown in M_6 under shading throughout the second season.

The increases in the number of shoots / plant were great with in the second season for the different media under shading , Table (1,2). These results were in agreement with those of **Bulter and Bearce (1995),** on *Rosa hybrida* cv. "Samantha" who indicated that there were no effect resulted from different media on the yield in the first year.

IV-1- B- Effect of growing media on flowers parameter:-

IV-1- B-1-Flower stem length (cms):

Data obtained on the effect of growing media under shading on flower stem length throughout the two seasons 2001and 2002 are averaged in Table (3) and illustrated in Fig (3).

Flower stem length values resulted from plants grown in different media, under shading were significantly taller with the media 2, 3 and 6 compared with the control. Meanwhile, the media 4 and 5 gave a shortest taller than the control or other media in the first and second seasons.

These results was similarly achieved by **Bulter and Bearce (1995),** and **Hayashi (1998),** who found that no difference in the yield and stem length of cut flowers was observed in the first year. While, the stem lengths were shorter in the second year, especially in the 70 and 50 % wood chips +FYM mixtures.

Similar results in Table (4) and Fig (4) were obtained as a result of different growing media under open field on flower stem length throughout both seasons. With respect to the media No. 6 which consisted of sand : soil : leaf mould gave the best increment in flower stem length during the two seasons. The tallest flower stem length significantly resulted from plants grown in M6. Meanwhile , the shortest one resulted from both M4 and M5. This is in confirmity with those results of **Bulter and Bearce (1995),** on *Rosa hybrida* cv. Samantha and **Maloupa *et al* (1999),** on roses who found that plants grown on 25 : 57 zeolite : perlite medium produced the highest total yield

and largest number of cut roses with stem length > 70 cm or (50 – 60) cm.

IV-1- B- 2- Number of leaves /flower stem:-

Data obtained on the effect of growing media under the two light intensities on the number of leaves on flower stem throughout 2001 and 2002 seasons are averaged in Tables (3,4).

The number of leaves / flower stem significantly increased due to the different media especially with (M2, M3, M5 and M6) under shade in the two seasons. Meanwhile, no significant increase was noticed from plant grown in the M4 during both seasons.

Under high light intensity no significant increase resulted from plants grown in M4 and M5 during the two seasons.

The great number of leaves per flower stem resulted significantly with the plants grown in M3 and M6 in both seasons which gave (2.25, 1.73) shoots, with the first season (5.72, 8.75)with the second season respectively meanwhile the control gave (2.25, 7.20) shoots during both season.

The obtained results were in agreement with **Farina *et al* (1985)** and **Zubair *et al* (1995).**

IV-1- B-3- Flower diameter:-

It is evident from data in Tables (3 and 4) the light intensity increased the flower diameter under both intensities during the two seasons.

The increase in flower stem diameter reached the level of significant with plants grown in M3 only during the first season with the high light intensity. While, the same increment resulted significantly with plants grown in M3 during the two seasons under the low light intensity.

No significant increase resulted in flower stem diameter during the two seasons due to the other growing media in both light intensities. The obtained results agree with those of **Hussein (2002),** who found that growing *Nerium oleander* in mixture of clay + sand + peatmoss increased number of branches and decreased stem diameter and root length. Mean while, **Albery (1975),** who stated that mixes containing sawdust were generally more satisfactory than those containing soil.

IV-1- B-4- Fresh and dry weight of flower stem in gms:-

Data obtained on the effect of growing media under low light intensity on the fresh and dry weights of flower stem throughout the two seasons 2001 and 2002 of H. T. roses are averaged in Tables (3) and (4).

There were significant increases from all growing media on the fresh weight of flower stem during the first season as compared to control. Whereas significant increases resulted from the plants grown in M_2 , M_3 , M_5 , and M_6 during the second season when plant were grown under high light intensity.

No significant increase were noticed with M_4 and M_5 during the two seasons under shade. This is in confirmity with those results of **Malorgio *et al.*, (1994) and Nasr (1997),** who found that the heaviest fresh and dry weights of inflorescences were obtained as a result of using mixtures of vermiculite + peatmoss or clay + peatmoss + vermiculite.

Data obtained on the effect of growing media on dry weight of flower stem throughout 2001 and 2002 seasons are averaged in Table (3,4) and illustrated in Figure (3,4) .

Considerable increment in dry weight of the flower stem was recorded resulting from growing the plants in M_2 , M_3 and M_6 during the first season . While , similar trend of results were recorded from growing the plants in M_2 , M_3 M_5 , and M_6 during the second season.

The increase in flower stem dry weight under both light intensities reached the level of significant during the two seasons and the greatest increase resulted from plants grown in M_6 compared with the control .

No significant increase in the dry weight of flower stem resulted from plants grown in M_4 during the two seasons. These results were similarly achieved by **Conover and poole (1975),** on aglaonema and **Crockett (1975),** on aspidistra who found that , the best results were obtained by using a mixture of 1 part loam, 1 part peatmoss or leaf mould, 1 part sharpsand, ½ part well rotted or dried cow manure.

From the above results it could be concluded that the different media used were considerably useful for growing H. T.

Table (3) : Effect of growing media on the flowering characters of H.T. roses grown under low light throughout the two seasons (2001/2002)

Treatments	First season					Second season				
	Flower stem length in cms	Number of leaves per flower(cms)	flower diameter in cms	Fresh weight of flower stem(cms)	Dry weight of flower stem(cms)	Flower stem length in cms	Number of leaves per flower(cms)	flower diameter in cms	Fresh weight of flower stem(cms)	Dry weight of flower stem(cms)
Control	22.03	3.15	4.03	6.30	1.95	24.93	4.11	3.95	6.37	2.13
2	26.56	4.80	3.58	8.55	2.60	29.58	5.88	3.57	8.75	2.93
3	29.18	6.68	6.35	11.45	3.70	32.39	7.63	6.50	11.88	3.96
4	20.88	3.50	4.48	6.05	1.88	23.82	4.50	4.57	6.25	2.09
5	19.35	4.32	4.58	5.38	1.73	22.53	5.32	4.75	5.75	2.90
6	30.55	7.00	4.10	12.38	4.08	33.52	8.00	4.22	13.13	4.36
L.S.D at0.05	2.13	1.12	0.53	1.02	0.40	2.11	1.13	0.86	1.52	0.50
L.S.D at0.01	2.92	1.53	0.73	1.41	0.55	2.89	1.55	1.18	2.08	0.69

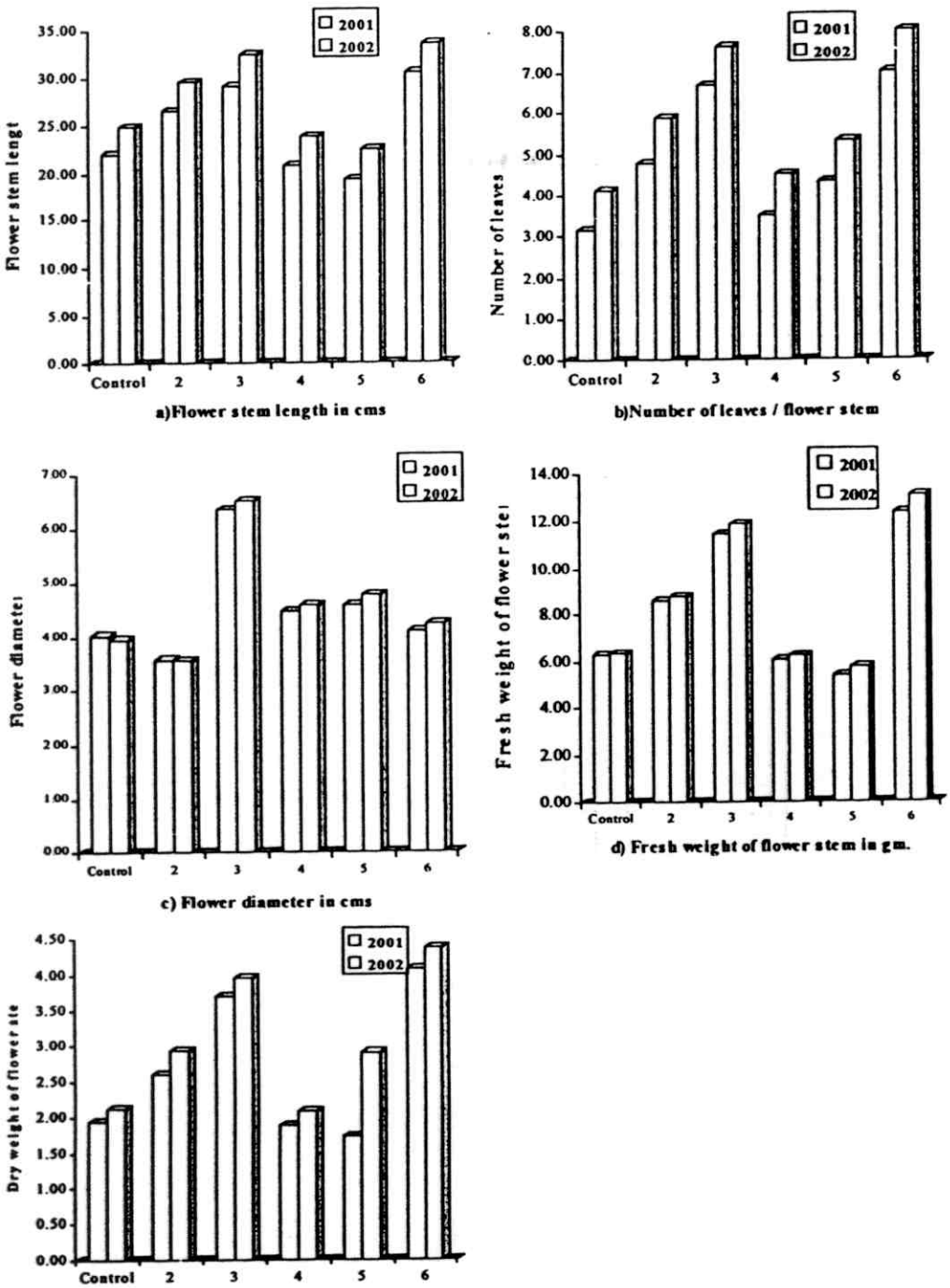
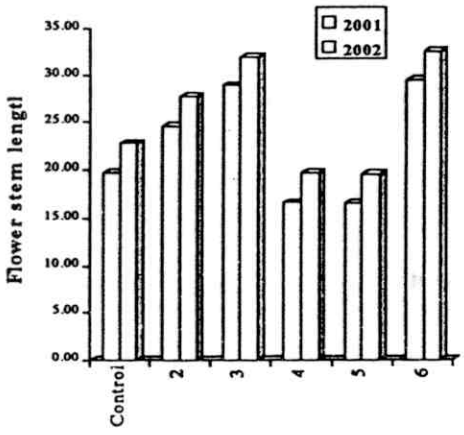


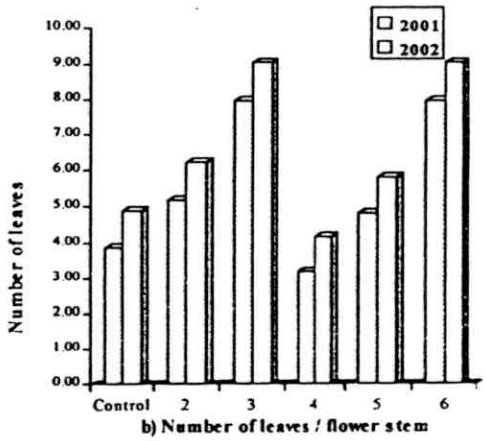
Fig (3) : Effect of growing media on the flowering characters of H.T. roses grown under low light intensity (2001/ 2002).

Table (4) : Effect of growing media on the flowering characters of H.T. roses grown under high light throughout the two seasons (2001/2002)

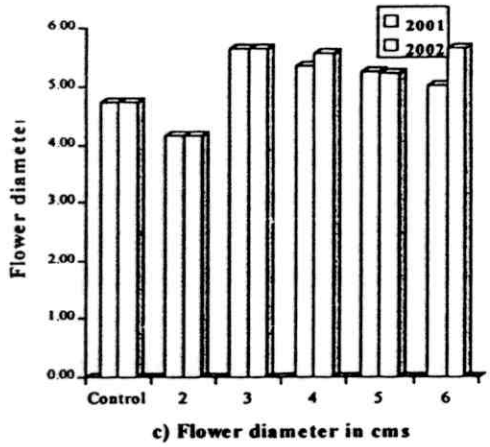
Treatments	First season					Second season				
	Flower stem length in cms	Number of leaves per flower(cms)	flower diameter in cms	Fresh weight of flower stem(cms)	Dry weight of flower stem(cms)	Flower stem length in cms	Number of leaves per flower(cms)	flower diameter in cms	Fresh weight of flower stem(cms)	Dry weight of flower stem(cms)
Control	19.75	3.87	4.72	7.10	2.03	22.72	4.90	4.73	6.77	2.24
2	24.60	5.20	4.15	10.07	3.38	27.70	6.23	4.15	11.23	3.74
3	28.88	7.95	5.62	12.40	4.33	31.95	9.01	5.63	14.69	4.86
4	16.70	3.17	5.35	7.45	2.43	19.67	4.18	5.55	7.94	2.63
5	16.58	4.80	5.23	7.80	2.45	19.58	5.80	5.20	8.59	2.83
6	29.50	7.95	5.00	14.15	5.08	32.53	9.04	5.63	16.25	5.37
L.S.D at0.05	3.49	0.95	0.68	1.25	0.37	3.51	0.94	1.22	1.74	0.57
L.S.D at0.01	4.78	1.29	0.93	2.08	0.50	4.81	1.29	1.67	2.29	0.78



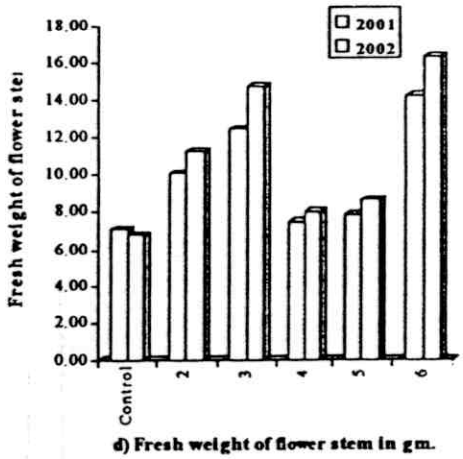
a) Flower stem length in cms



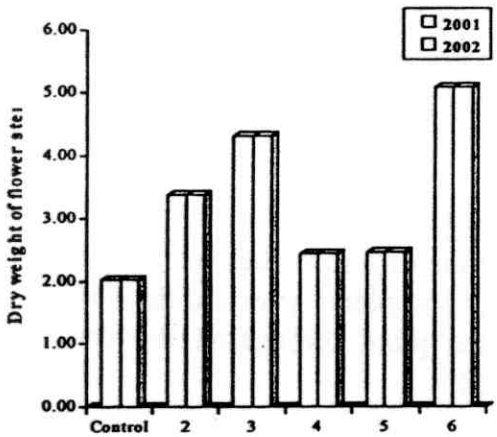
b) Number of leaves / flower stem



c) Flower diameter in cms



d) Fresh weight of flower stem in gm.



e)Dry weight of flower stem in gm

Fig (4) : Effect of growing media on the flowering characters of H.T. roses grown under high light intensity (2001/ 2002).

roses. The growth took neary similar trend whether the media were under high or low light inensity. The most important medium which gave excellent growth in both locations was M_6. That medium consisted of sand : Gs : leaf mould (dry leaves of *Ficus elastica*) 1 : 1 : 1 by volume , and could be recommended for modifing the soil to be more suitable for the growth the of H. T.s roses.

IV-2-EXPERIMENT(2)

The effect of light intensities on growing different groups of roses:

IV-2-A-Vegetative growth of *Rosa bankesia*:-

IV-2-A- 1- Plant height (cms) :

It is obvious from Table (5) that the plant height of Rosa bankesia was affected by plantation under both shading under trees or open filed (the low and the high light intensities).

In the first season the corresponding values were 99.63 cm for plants at the high light intensity against 92.43 cm for plants under the low light intensity. The differences in this respect were highly significant during the two seasons.

Our results are in accordance with those of **Vries** and **Smeets (1978),** on Rose who found that increasing the irradiance from 4 to 24 watts/m2 increased the plant height. Also, **Armitage** and **Tsujita (1979),** reported that increasing the intensity at 105 Ev/m2/sec increased stem length. In the other hand, **Andersson (1993),** stated that plant height was increased with increasing shade for Roses.

IV-2-A- 2- Number of shoot / plant:

It is clear from Table (5) that the difference between plants grown at the low light in intensity and plants grown at the high light intensity on bankesia rose plant throughout the two seasons 2000/2001 and 2001/2002.

There were highly significant increase in shoot number reslted from plants grown under full sun light (6.18- 32.80) during the two seasons, respectively compared with plants grown under the low light intensity as (4.75- 17.00) during the two seasons, respectively.

The obtained results were in agreement with **Hick (1984),** on *Rosa sp* who found that, Although, **Joiner (1977),** stated that *Ficus benjamina* growth and quality were the best with the highest shade level. Also, **Poole and Conover (1980),** reported that when light level decreased the plant growth of *Pittosporum.* It means that roses are sun plants which act positively with the high light intensity.

IV-2- A- 3- The number of leaves/plant:-

Data obtained on the effect of the light intensity of *Rosa benkesia* on the number of leaves/ plant are averaged in Table (5).

The number of leaves / plant were (423.50 - 2129.50) for shaded plants and (703.50 - 3416.20) for the open filed, respectively in the two seasons.

The differences were highly significant between the two types of plantation during the two seasons.

Such results was similarly observed by **Auge *et al* (1990),** on Rose cv "Samantha" who found that plants grown under full ambient light in the greenhouse, or placed in shade chambers, the two different weaves of shadecloth were utilized to give mildly and heavily shaded treatments.

IV-2-B- Flowering parameters of *Rosa bankesia*:

IV-2-B- 1 The number of flowers/ plant:-

Data in Table (6) represent the differences between plants grown under the two light intensities on the number of flowers/ plant throughout the two seasons 2000/ 2001 and 2001/2002

The total numbers of flowers resulted from plants grown under the low light intensity were (42.60 – 95.20) during the two seasons, respectively. While, the flowers resulted from plants grown under the high light intensity were (339.70 –609.35) during the two seasons, respectively. The differences between shaded plants and plants grown at open filed significantly increased throughout the two seasons. It means that the *R. bankesia* with be more beautiful if grown in full sunlight, although the plants can be grown for few flowering results. These results are in agreement with **Carpenter and Anderson (1972),** on Roses who found that increasing the duration of

lighting increased the number of flowers. **White and Richard (1973),** gave similar results. **While, Berg (1979),** found that, a reduction of 12% light intensity resulted in 14 percent less flower yield in Rosa cv Sonia.

IV-2-B- 2- The flower fresh weight (gms):-

The flower fresh weights as a result of growing *R. bankesia* plants under the two light intensities throughout the two seasons 2000/2001 and 2001/2002 are shown in Table (6).Highly significant increase resulted from plants grown at the high light intensity compared with that resulted from the plants the low light intensity during the two seasons. These results were in agreement with **Carpenter (1972),** on several cultivars of *Rosa hybrida* who found that long photoperiod gave heavier fresh weight. Also, **Armitage (1979),** on roses reported that lighting at 105 Ev/m2/sec increased fresh weight of flowers.

IV-2-B- 3- The flower dry weight (gms):

It is evident from Table (6) that the flower dry weight was increased in plants grown at the open filed compared to plants grown under shading.

The increment in flower dry weight was highly significant throughout the two seasons as shown (0.50 –0.25 gms) with shaded plant and (0.66 – 0.73 gms) with full sunlght plants, respectively. This finding was in agreement with **Carpenter (1972),** on *Rosa hybrida,* **White and Richard (1973),** on roses found that the continuous lighting increased the dry weight of the flower.

IV-2-B- 4- The number of petals/flower:-

As shown in Table (6) the number of petals increased with the plants grown under high light intensity compared with the shaded plants under trees.

The increase in number of petals / flower was significant due to the effect of light which increased the photosynthesis that caused in great vegetative growth and good quality of flowers as shown throughout the two seasons 2000/2001 and 2001/2002. As this was supported by findings of **White and Richard (1973),** on Rose cv. Red American Beauty who reported that continuous lighting improved the yield and quality of flower . Also, **Johonsson (1973),** who found that

Table (5) : Effect of different light intensities on the vegetative growth of *Rosa bankisia* throughout 2000 and 2001.

Treatments	2000			2002		
	Plant height cms	No. of shoots/plant	No. of lvs./ plant	Plant height cms	No. of shoots/plant	No. of lvs./ plant
Low light	92.43	4.75	423.50	235.78	17.00	2129.50
High light	99.63	6.18	703.50	326.40	32.80	3416.30
L.S.D at 0.05	2.63	0.45	6.39	8.12	3.02	35.47
L.S.D at 0.01	3.99	0.67	9.69	12.30	4.57	53.74

Table (6) : Effect of two different light intensitis on the flowering characters of Rosa bankisia throughout 2000and 2002.

Treatments	2000					2002				
	Fresh weight of flower (gm)	Flower diameter in cms	Number of betals/ flower	Dry weight of flower (gm)	Number of flower/ plant	Fresh weight of flower (gm)	Flower diameter in cms	Number of betals/ flower	Dry weight of flower (gm)	Number of flower/ plant
Low light	1.58	3.45	33.90	0.50	42.60	1.78	3.50	34.18	0.52	95.20
High light	2.40	4.13	38.73	0.66	339.70	2.65	4.20	40.73	0.73	609.35
L.S.D at 0.05	0.15	0.34	1.96	0.05	6.20	0.19	0.35	2.84	0.02	7.56
L.S.D at 0.01	0.23	0.52	2.98	0.07	9.40	0.29	0.53	4.30	0.04	11.45

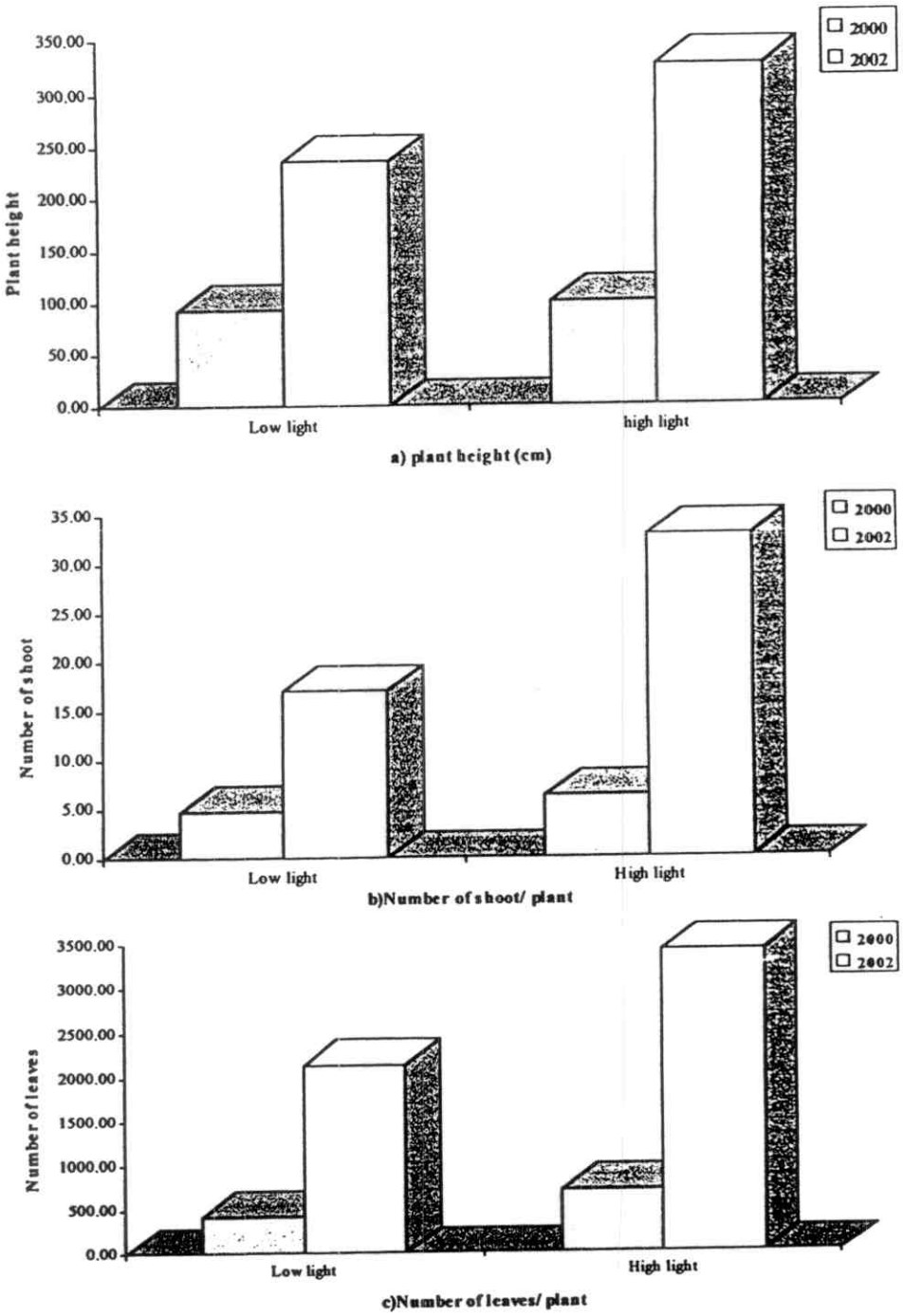
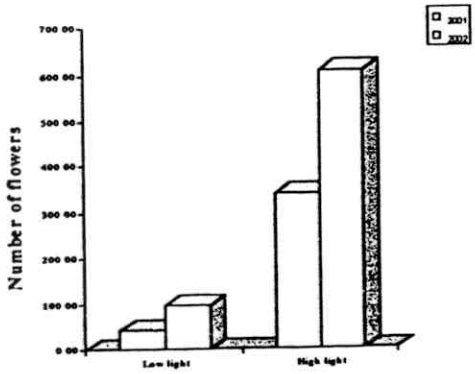
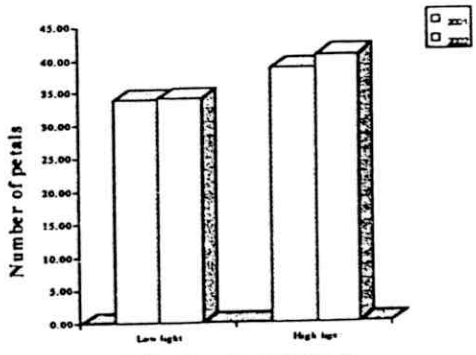


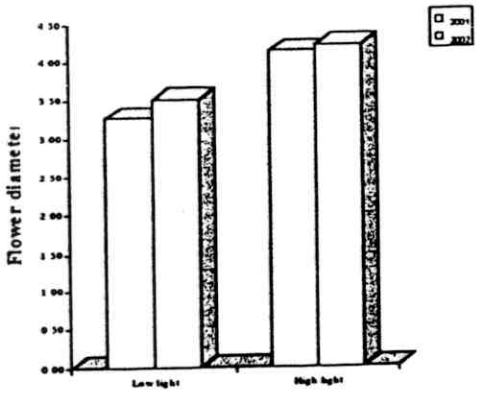
Fig (5) : Effect of two different light intensities on the vegetative growth of *Rosa bankisia* (2000/ 2002) .



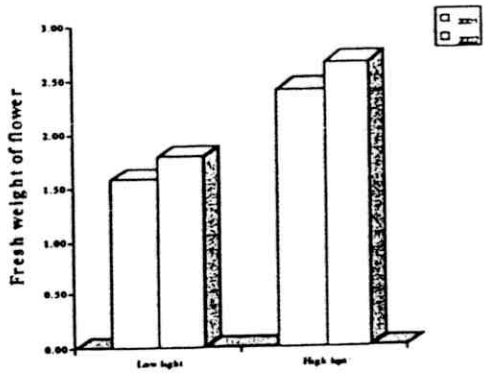
a)Number of flowers/plant



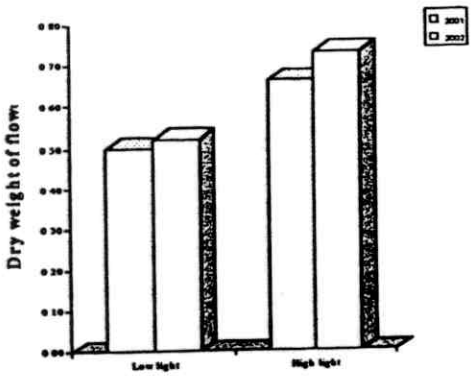
b) Number of petals/flower



c) Flower diameter in cms



d) Fresh weight of flowers in gm.



e) Dry weight of flower in gm

Fig (6) : Effect of two different light intensities on the flowering characters of *Rosa banksiana* (2000/ 2002)

lighting the plants in the middle of the night increased the yield of flowers and slightly improved the size of flower heads.

IV-2-B-5- The diameter of flower (cms):-

Data in Table (6) and Fig (6) represented the effect of shading and unshading plants on the diameter of flower during the two seasons 2000/2001 and 2001/2002. The difference between shaded and unshaded plants on the diameter of flower during the two seasons reached to the level of significant. The diameters were (3.45- 3.5 cms) with the shaded plants and (4.13-4.2 cms) with the unshaded plants throughout the two seasons, respectively. In addition the findings were in agreement with **Johonsson (1973),** on *Chrysanthemum frutescens* who found that, lighting the plants in the middle of the night not only advanced flowering by 8 - 14 days according to the cultivar, but also increased the yield of flower and slightly improved the size of flower heads.

It is clear from the above results that *R. bankesia* must be grown in the open field for landscape purposes. The plants grown under low light intensity could grow but with inferior display.

IV-2-C- Vegetative growth of *Rosa poliantha*:-

IV-2-C- 1- Plant height(cms):-

Data obtained on the effect of shaded and unshaded on plant height throughout 2000 / 2001 and 2001/2002 are averaged in Table (7).

No significant increment was noticed on plant height of *Rosa poliantha* resulted from the different light intensities during the first season. Meanwhile, highly significant increment on plant height resulted from the two different light intensities during the second season as shown (74.1 – 86.8 cms) for shaded and unshaded , respectively. This finding were in agreement with **Cathey (1974) , Vries and Smeets (1978),** on *Rosa sp.* who found that increasing the irradiance from 4 to 24 watts/m2 increased plant height. **White (1973), Andersson (1993),** on the other hand stated that Rosa cv. Victory parade increased plant

height with the increasing shade.

IV-2-C- 2- The number shoot / plant :-

It is evident from Table (7) that the shoot number was insignificantly affected by the two different light intensities on *Rosa poliantha* during the first season. Meanwhile, the difference between shaded and unshaded plants for the number of shoots was highly significant during the second season. Similar results were observed by **Armitage and Tsujita (1979),** who found that, increasing the intensity to 158 Ev/m2/sec was effective as the lower intensity on stems and advanced Rosa sp cv Forever flowering and the yield of flowers.

IV-2-C- 3- Number of leaves / plant :-

Data obtained on the effect of different light intensities on the number of leaves per plant during the two seasons 2000/2001 and 2001/2002 are averaged in Table (7).

There were highly significant increase in the number of leaves per plant resulted from open field plantation compared with shaded plants during the two seasons. In the first case the plant gave a 37.50 compared to 45.00 for the high light intensity. This is conformity with those results of **Hendriks and Ludolph (1988),** they found that, *Dieffenbachia maculata* and *Ficus benjamina* were most responsive, with an increas in plants size, branching and leaf number.

IV-2- D-The flower parameters of *Rosa poliantha*:-

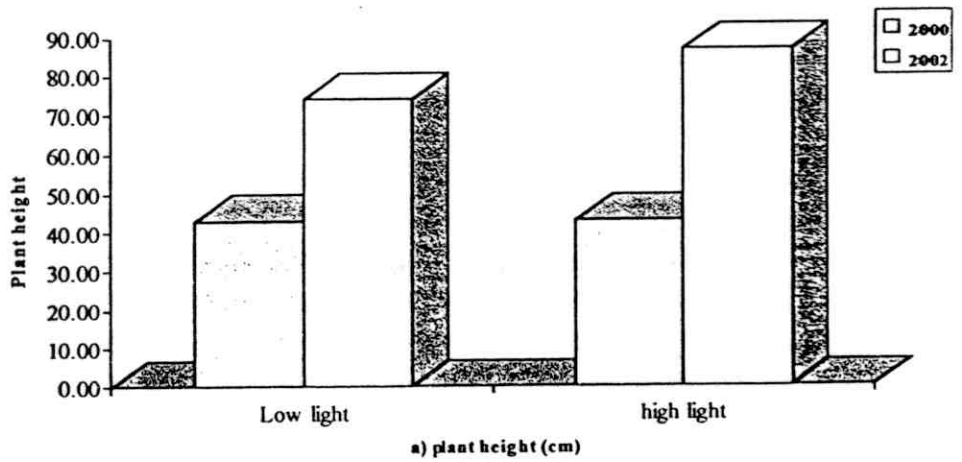
IV-2- D-1- Flower stem length (cms):-

It is obvious from Table (8) that the flower stem length of *Rosa poliantha* was affected by the two different light intensities during the first season with significant increase for the open field plants over the shaded plants. During the second season the increase was highly significant as (43.6 – 46.5 cms), respectively.

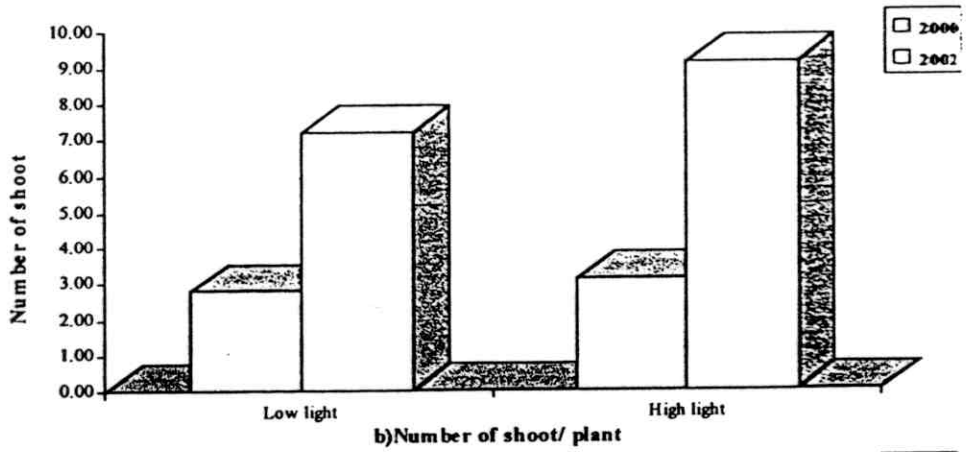
These results were in agreement with **Carpenter and Andersson (1972), Armitage and Tsujita (1979),** and **Hick and Coker (1988),** on roses who found that the high light intensity had a promising effect on the flower stem length.

Table (7) : Effect of two different light intensities on the vegetative growth of *Poliantha roses* throughout 2000 and 2002.

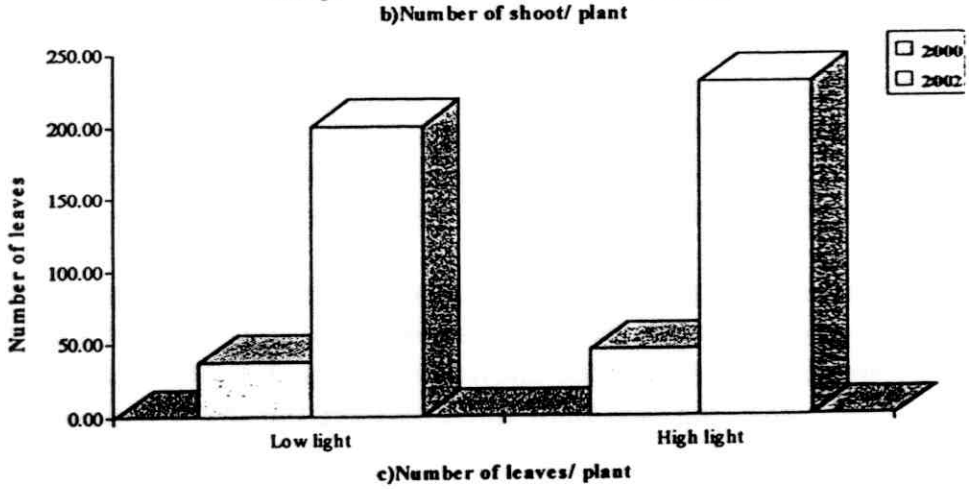
Treatments	2000			2002		
	Plant height cms	No. of shoots/ plant	No. of lvs/ plant	Plant height cms	No. of shoots/ plant	No. of lvs/ plant
Low light	42.97	2.78	37.50	74.10	7.20	199.70
High light	42.83	3.10	45.00	86.80	9.10	229.60
L.S.D at 0.05	4.97	0.49	2.04	4.40	1.50	25.10
L.S.D at 0.01	7.54	0.74	3.09	6.70	2.40	38.00



a) plant height (cm)



b)Number of shoot/ plant



c)Number of leaves/ plant

Fig (7) : Effect of two different light intensities on the vegetative growth of *Poliantha roses* (2000/ 2002).

IV-2- D- 2- The number of shoot / plant:-

Data concerning the effect of the two different light intensities on the shoot number of *Rosa poliantha* throughout 2000/2001 and 2001/2002 are tabulated in Table (8)

During the first season there was insignificant increase in the number of shoot resulted from the two light intensities as shown (2.3 – 2.7). While, highly significant increase resulted from the open field plants compared with shaded plant during the second season. Similar results observed by **Armitage and Tsujita (1979),** they concluded that increasing the light intensity increased the number of branches on rose plants.

IV-2- D- 3-The number of leaves /flower stem:-

It is obvious from Table (8) that the two different light intensities affected the number of leaves/ flower stem of *Rosa poliantha* throughout 2000/2001 and 2001/2002 .

There was a significant increase resulted from the two different light intensities on the number of leaves per flower stem as shown (8.2 – 9.2) with the first season and (10.4 – 12.3) with the second season. As for, **Horn and Huber (1983),** on Ficus leaves who reported that Ficus leaves dropped at under low light intensity 300 lux. While, **Demming and Bior- Kman (1987),** showed that low light intensity decrease the chlorophyll in the plant tissues, consequently reduce photothen thesis and formatio of new leaves.

IV-2- D- 4- Fresh and dry weight of leaves (gms):-

Data obtained in Table (8) represented the effect of the two different light intensities on fresh and dry weight of leaves of *Rosa poliantha* throughout 2000/2001 and 2001/2002

During the first season there was insignificant increase on fresh weight of leaves due to the two light intensities. Meanwhile, the difference showed highly significant increase resulted from the two light intensities on the dry weight of leaves.

In the second season there was a highly significant increase resulted from the two light intensities on the fresh and dry weight of leaves . These results were similar with those observed

by **Carpenter (1972),** who found that high light intensity had increased the fresh and dry weight of roses.

IV-2- D- 5- The number of flowers / cluster:-

The data in Table (8) show highly significant increase in the number of flowers / cluster resulted from plants grown in the open field compared with plants grown under tree shad during the two successive seasons.

These results were in conformity with those results of **Carpenter and Andersson (1972),** on Rosa sp. Cv. Forever years, White and Richard (1973), on Rosa sp. Cv. Red American Beauty.

IV-2- D- 6- The flower diameter (cms) complet opening :-

It is obvious from data in Table (8) that the effect of the two different light intensities on the flower diameter was clear during two successive seasons.

There were highly significant increases in flower diameter resulted from plants grown at open field compared with shaded plants during the two seasons which increased the value from (2.1 – 2.2 cms) to (3.4- 3.5 cms) . These results were in agreement with these obtained by Johonsson (1973), on Chrysanthemum and Cathey and Campbell (1975), on the same plant who found that lighting Chrysanthemum frutescens plant with different kinds of illuminations for 16 h advanced the flowering by 9 – 12 days, improved plant height and increased the number and diameter of in floresences

IV-2- D-7- The number of culster /plant :-

Data obtained on the effect of the two different light intensities on the number of flowers per plant of Rosa poliantha throughout 2000/2001 and 2001/2002 averaged in Table (8).

It is clear that plants grown in open field had more response than those under tree shade plantation, the total yield of

flower increased obviously and significantly as (101 – 138) in the first season and (107 – 161.8) in the second season . These finding were in agreement with White and Richard (1973), Croenendijk and Rissel (1978), and Oprel (1979), on Rosa cv. Sonia who found that the assimilation lighting in glasshouse during winter months increased the flower yield by 8.6 percent.

IV-2- D-8- Fresh and dry weight of culster:-

It is evident from Table (8) that fresh and dry weight of the stem as affected by the two different light intensities was great with second season than the first one.

The fresh weight resulted from open field plantation gave a significant increase with the first season and highly significant increase with the second. While, the dry weight occurred gave highly significant increase during the two successive seasons which increased the value (5.6 – 5.5) with fresh weight at shaded plants to(5.7 – 7.0)with unshaded whereas the dry weight which increased the value from (1.9 – 2.2) with shaded to (3.0 – 3.6) with unshaded during the two seasons. This finding were in agreement with whose observed by Carpenter (1972) , **While and Richard (1973)** and **Armitage and Tsiyita (1979).**

IV-2- D-9- Fresh and dry weight of flower:-

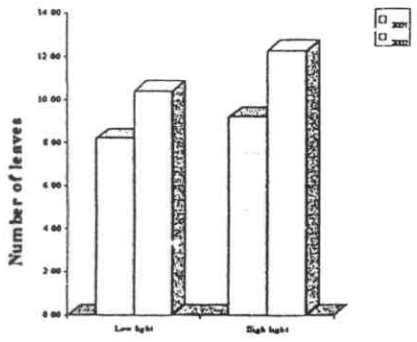
Data obtained on the effect of the two different light intensities on fresh and dry weight of flowers throughout 2000/2001 and 2001/2002 of Rosa poliantha are tabulated in Table (8).

There was highly significant increase in fresh weight of flowers resulted from open field plantation compared with shaded plants during the two successive seasons as (7.5 – 10.5 gms) and (8.3 – 11.1 gms) respectively.

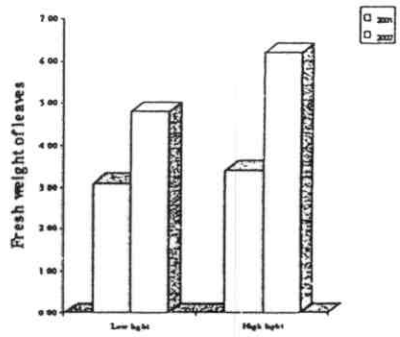
The dry weight of flowers resulted from comparing the two light intensity gave significant increase during the two seasons. Similar to, Carpenter (1972), on Rosa hybrida who stated that fresh and dry weight of flower increased with the increasing of lighting. In addition, Armitage and Tsujita (1979), who concluded that lighting at 105 EV/m2/sec increased fresh weight.

Table (8) : Effect of two different light intensities on the flowering characters of *Poliantha roses* during 2001 /2002

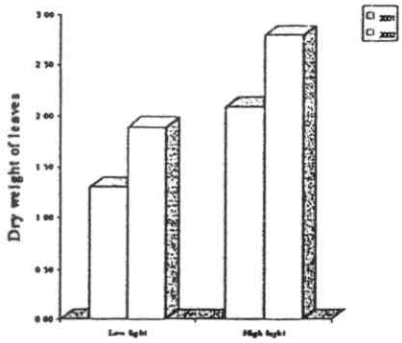
Treatments	2001											
	Flower stem length	No. of shoots/ stem	No. of leaves / stem	Fresh weight of leaves	Dry weight of leaves	Fresh weight of flower	Dry weight of flower	No. of of flower/ cluster	Flower diameter	Fresh weight of stem	Dry weight of stem	No. of flower/ plant
Low light	33.80	2.30	8.20	3.10	1.30	7.50	3.00	15.00	2.10	5.60	1.90	101.00
High light	35.00	2.70	9.20	3.40	2.10	10.50	4.20	21.00	3.40	5.70	3.00	138.00
L.S.D at 0.05	0.90	0.49	0.90	0.40	0.40	0.80	0.30	1.50	0.40	0.60	0.20	18.10
L.S.D at 0.01	1.37	0.74	1.40	0.70	0.60	0.10	0.50	2.30	0.70	1.00	0.30	27.40
Treatments	2002											
	Flower stem length	No. of shoots/ stem	No. of leaves / stem	Fresh weight of leaves	Dry weight of leaves	Fresh weight of flower	Dry weight of flower	No. of of flower/ cluster	Flower diameter	Fresh weight of stem	Dry weight of stem	No. of flower/ plant
Low light	43.60	3.70	10.40	4.80	1.90	8.30	3.30	16.60	2.20	5.50	2.20	107.30
High light	46.50	4.30	12.30	6.20	2.80	11.10	4.40	22.30	3.50	7.00	3.60	161.80
L.S.D at 0.05	1.60	0.30	1.40	0.30	0.30	1.10	0.40	2.10	0.40	0.60	0.60	10.17
L.S.D at 0.01	2.40	0.50	2.10	0.40	0.40	1.60	0.60	3.20	0.60	0.80	0.90	15.40



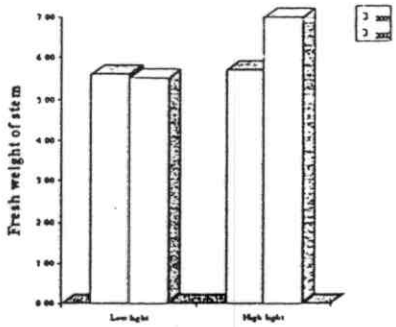
a)Number of leaves /stem



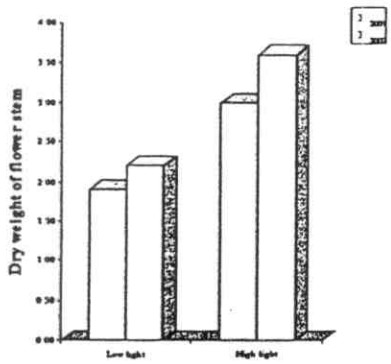
b) Fresh weight of leaves in gm



c) Dry weight of leaves in gm

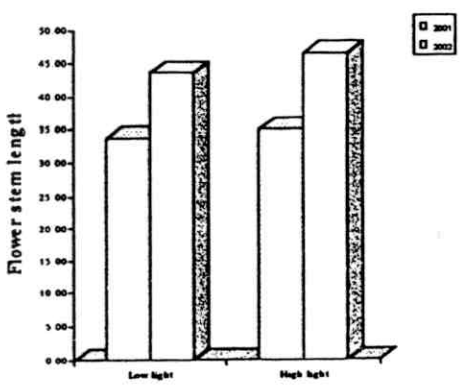


d) Fresh weight of stem in gm.

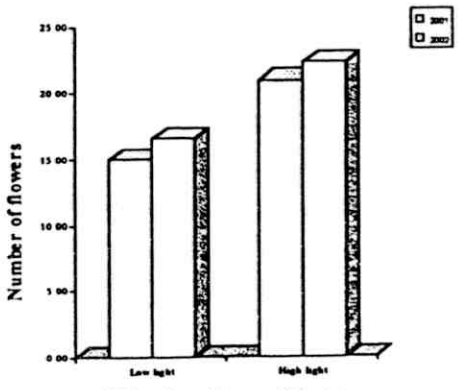


e) Dry weight of flower stem in gm

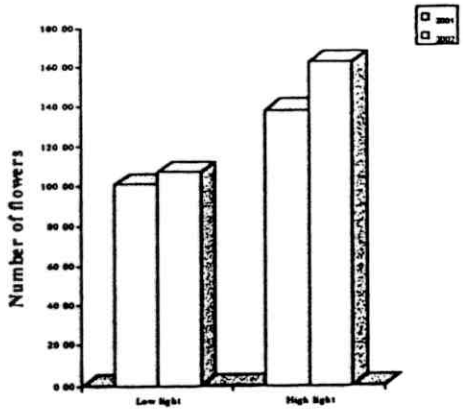
Fig (8) : Effect of two different light intensities on the flowering characters of Polianthn roses (2000/ 2002).



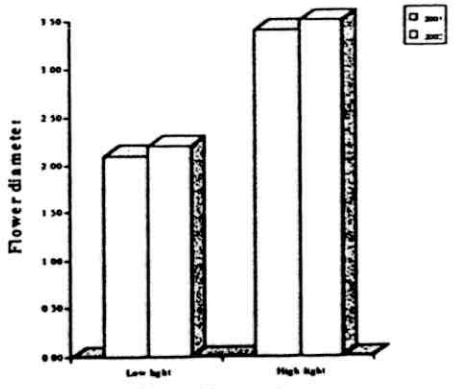
a)Flower stem length in cms



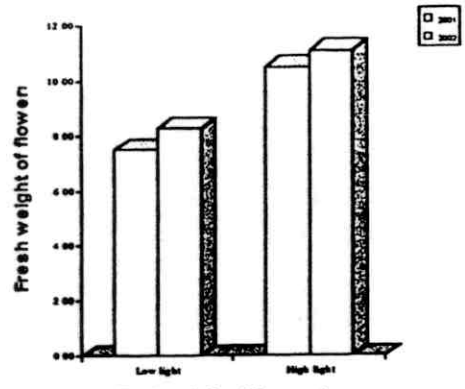
b) Number of flowers/cluster



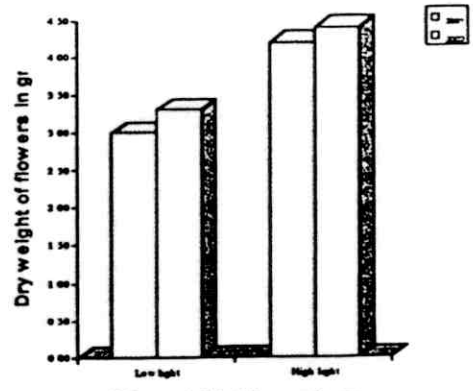
d) Number of flowers/plant



c) Flower diameter in cms



e) Fresh weight of flowers in gm



f) Dry weight of flowers in gm

Cont: Fig (8) : Effect of two different light intensities on the flowering characters of *Pollantha roses* (2000/ 2002).

On the ground of the above results at could conclude that the response of R. poliantha to the day light was enormous with the high intensity. However, the plants under shade gave same promising effects but not the ideal. For this reason R. poliantha also could be fairly used in landscape of shaded locations. The over beauty of the plants grown under full sunlight was due to the activation of photosynthesis and to the more metabolitas which afferded the plants to better groth and flowering.

IV-2 - E- Vegetative growth of Rosa chinensis var. Manetti:-

IV-2- E-1- Plant height:-

Data obtained on the effect of shading under trees and open field plantation on the plant height in both seasons are averaged in Tablc (9).

There was a highly significant decrease in plant height with open field plants compared with shaded plants during the first season. Meanwhile, in the second season highly significant increase in plant height resulted from plants grown in the open field compared with shaded plants. Similar effect was mentioned by **Moe (1972),** on roses. Whereas, **Andersson (1993),** concluded that plant height was increased with increasing shade for roses. In addition, **Cathey (1974),** who observed that the quantity and quality of light affected on stem length of 22 different ornamental plants.

IV-2- E-2- Numbers of shoots /plant :-

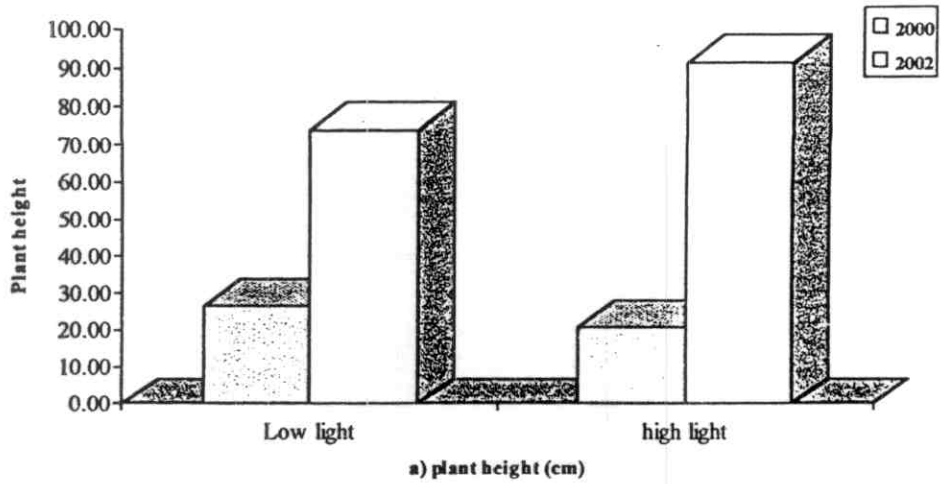
Data in Table (9) show the great effect of growing the plants under trees shading and at the open field on the shoot numbers per plant of Manetti roses throughout the seasons 2000/2001 and 2001/2002.

The differences were highly in significant during the first and second seasons.

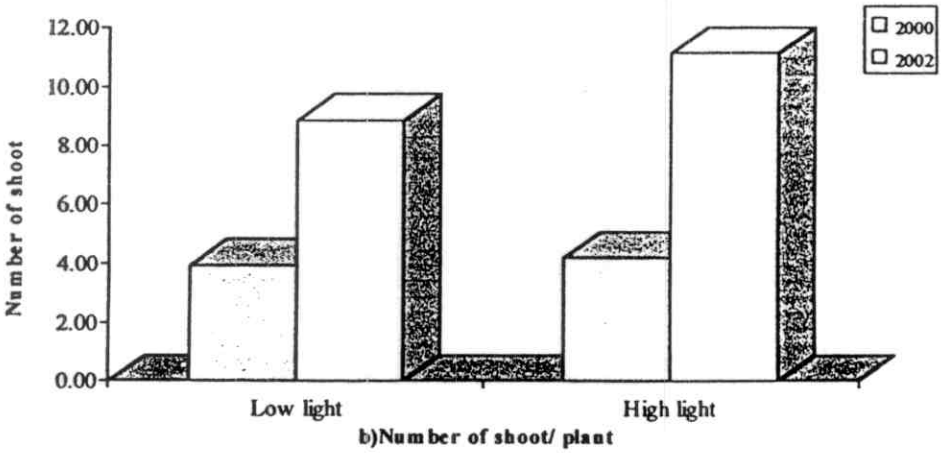
Similar results were observed by Carpenter and **Andersson(1972).** Also, Armitage and Tsujita (1979), on Rosa sp. Cv. Forever reported that supplementary lighting at 105 EV/m2/sec increased stems and advanced flowering.

Table (9) : Effect of two different light intensities on the vegetative growth of *Mantti roses* throughout 2000 and 2002.

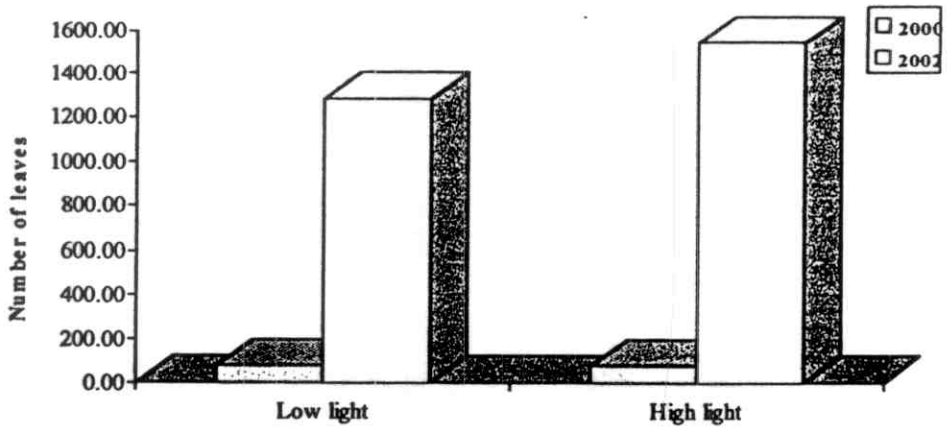
Treatments	2000			2002		
	Plant height cms	No. of shoots/ plant	No. of lvs/ plant	Plant height cms	No. of shoots/ plant	No. of lvs/ plant
Low light	26.80	3.95	77.97	73.95	8.87	1283.50
High light	21.05	4.20	78.70	91.50	11.12	1545.00
L.S.D at 0.05	1.56	0.23	4.11	7.49	1.33	108.90
L.S.D at 0.01	2.37	0.35	6.22	11.35	2.01	165.00



a) plant height (cm)



b)Number of shoot/ plant



c)Number of leaves/ plant

Fig (9) : Effect of two different light intensities on the vegetative growth of *Manetti roses* (2000/ 2002).

IV-2- E-3- The number of leaves /plant :-

Data obtained from the effect of the shading under trees and the open field plantation on the number of leaves per plant during the two seasons are tabulated in Table (9)

No significant differences are noticed between both shaded or unshaded plants during the first season. Meanwhile, highly significant increase resulted between shaded or unshaded plants during the second season. The plant under high light intensity gave 1545 lvs/ plant compared to 1283 under shade. This was probably due to the great efficiancy of photothenthesis and metabolites building. In the other hand Joiner (1977), on Ficus benjamina who found that plant growth on quality were the best with the highest shade level (80 % shading).

While, Poole and Conover (1980), on pittosporum who found that when light levels decreased plant height and leaf size increased.

IV-2–F - On flowering parameters:-

IV-2–F - 1-Flower stem length (cms):-

Data obtained from the effect of shaded or unshaded plants on the flower stem length during both seasons 2000/2001 and 2001/2002 are presented in Table (10) and Fig (10).

Highly significant increases were noticed between shaded and unshaded plant of manetti roses throughout the two seasons. The plants under full sunlight gave significantly at 0.01 level taller plants than those under shade during both seasons i.e.64.4 cms and 43.75 cms, respectively, in the second season. The results agree with those by Carpenter and Anderson (1972), Armitage and Tsujita (1979), Hick (1984), and Coker (1988), who found that shaded plants produced shorter flower stem / plant. Meanwhile, Bien and Lemeur (2000), stated that the low night temperature, combined with the non limiting light intensity enhanced the flower stem of roses.

IV-2-F - 2-The number of leaves / flower stem:

The number of leaves increased with plants grown at open field than those grown under trees shading during the two seasons as (23.47 – 41.03) with shaded plants and (32.47 – 53.7) with the unshaded plant, respectively,Table (10).

The difference reached to highly significant level during the two seasons. Whereas, the increase of leaves per flower stem was great during the second season than the first one. In this concern **Horn and Huber (1983)**, concluded that 300 Lux affected on Ficus leaves dropped and some growing points died because it required at least 800 lux.

IV-2–F - 3- The number of flowers / cluster:-

Data in Table (10) show the effect of shaded and unshaded plants of manetti roses on the number of flowers per cluster during the two seasons 2000/2001 and 2001/2002.

There was highly significant increase in the number of flowers per cluster during the two seasons resulted from plants grown in the open field compared with plants grown at shading under trees.

There is no great difference appears between the two seasons on data of the number of flowers per cluster. These results were similarly observed by **Carpenter and Andersson (1972),** on Rosa sp. Cv. Forever years, **White and Richard (1973),** on Rosa sp. Cv. Red American Beauty. They found that increasing the duration of lighting increased the number of flowers. Also, **Berg (1979),** who found that a reduction of 12% light intensity resulted in 14 percent less flower yield in Rosa cv. Sonia and Illona.

IV-2 –F -4- Flower diameter (cms):-

In Table (10) highly significant differences were recorded for flower diameter due to growing the plants under the different light intensities during the two seasons. The value increased from (2.3 to 2.9 cms) with the_open field in both seasons, respectively.

Whereas, **Johansson (1973),** on several cultivars of

Chrysanthemum found that lighting the plants in the middle of the night not only advanced flowering , but also slightly improved the size of flower heads. On the same plant Cathey and Campbell (1975), reported that lighting plants with different kinds of illuminations for 16h increased the diameter of infloresences.

IV-2–F -5- Fresh and dry weights of flower stem (gms):-

Data in Table (10) show that open field resulted in highly significant increase on the fresh and dry weigh of flower stem in both seasons. It increased the value of fresh weight to (9.83 – 13.0 gms) during the two seasons, respectively. While, the dry weight of flower stem increased to (4.18 – 5.3gms) during both seasons, respectively.

Shaded plants resulted in lower fresh and dry weight during both seasons. These results were in agreement with those of Carpenter (1972), on several cultivars of Rosa hybrida. Also, White and Richard (1973), on Rosa sp. cv. Red American Beauty. Moreover, Armitage and Tsujita (1979), who reported that lighting at 105 EV/m2/sec increased fresh weight.

IV-2–F -6- Fresh and dry weights of leaves (gms):-

Fresh weight of leaves represented in Table (10)show a highly significant increase in plants grown at open field compared with shaded plants of Manetti roses during the two seasons.

During. the second season the difference in dry weight of leaves was significant as (3.6-4.6 gms) between shaded and unshaded plants , respectively. This finding disagree with Coker (1988), who found that shaded plants produced 9% greater leaf dry weight than unshaded plants roses.

IV-2–F -7- Fresh and dry weights of flower (gms):-

The results in Table (10) clearly indicate that the open field plantation was more effective and significantly increased the fresh and dry weight of flowers in both seasons. This findings

Table (10) : Effect of two different light intensities on the flowering characters of *Manetti roses* during 2001 /2002

Treatments	2001										
	Flower stem length	No. of leaves / stem	No. of of flower/ cluster	Flower diameter	Fresh weight of flower	Dry weight of flower	Fresh weight of stem	Dry weight of stem	Fresh weight of leaves	Dry weight of leaves	No. of flower/ plant
Low light	29.58	23.47	7.50	1.60	2.20	0.52	7.43	3.13	4.30	2.00	54.00
High light	38.38	32.47	9.22	2.30	2.70	0.70	9.83	4.18	5.60	2.40	74.30
L.S.D at 0.05	1.61	3.48	0.47	0.38	0.40	0.18	0.66	0.27	0.36	0.14	4.08
L.S.D at 0.01	2.45	5.28	0.71	0.58	0.20	0.27	1.01	0.42	0.55	0.21	6.19
Treatments	2002										
	Flower stem length	No. of leaves / stem	No. of of flower/ cluster	Flower diameter	Fresh weight of flower	Dry weight of flower	Fresh weight of stem	Dry weight of stem	Fresh weight of leaves	Dry weight of leaves	No. of flower/ plant
Low light	43.75	41.03	7.96	2.00	2.35	0.75	9.40	4.10	7.50	3.60	75.28
High light	64.40	53.70	9.88	2.90	3.05	0.95	13.00	5.30	10.70	4.60	94.53
L.S.D at 0.05	2.40	2.30	0.66	0.40	0.41	0.09	1.06	0.60	1.00	0.70	5.45
L.S.D at 0.01	3.63	3.50	1.00	0.70	0.62	0.15	1.60	1.00	1.50	1.10	8.26

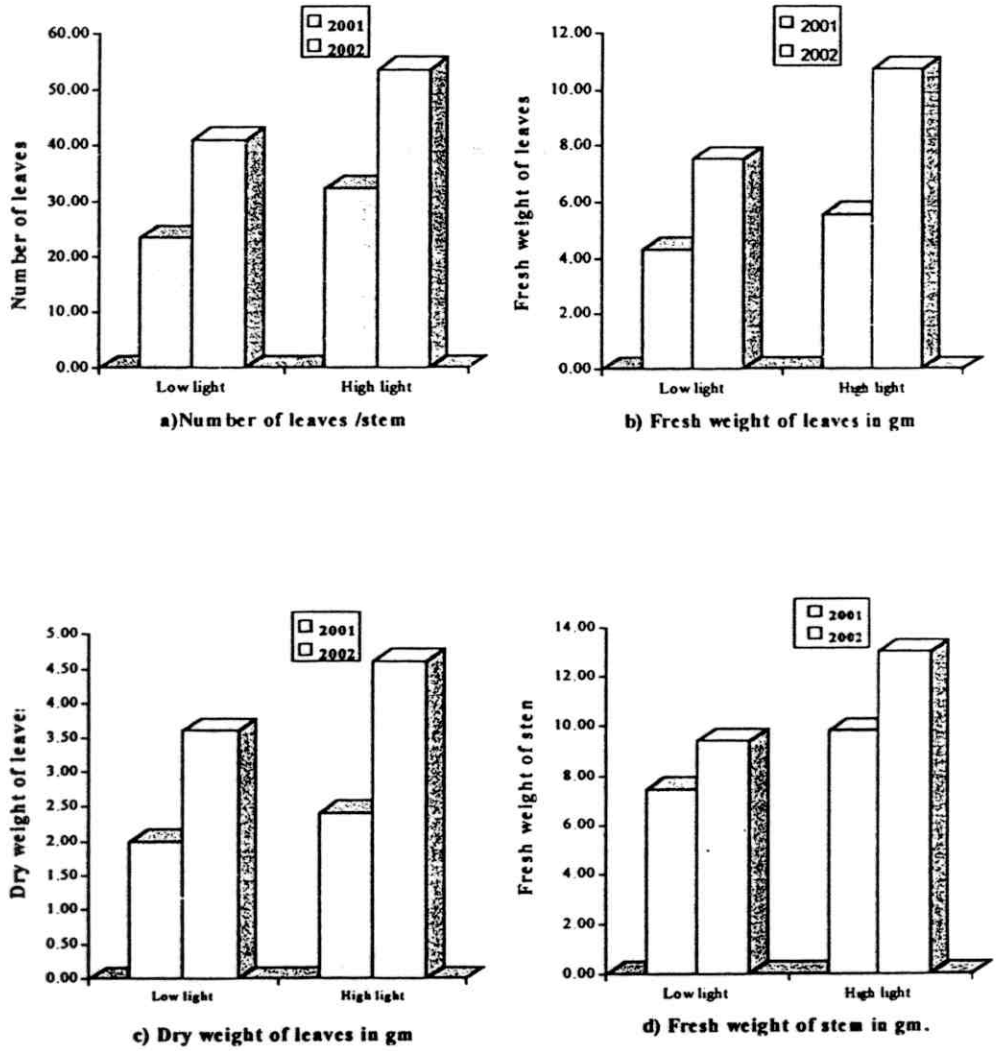
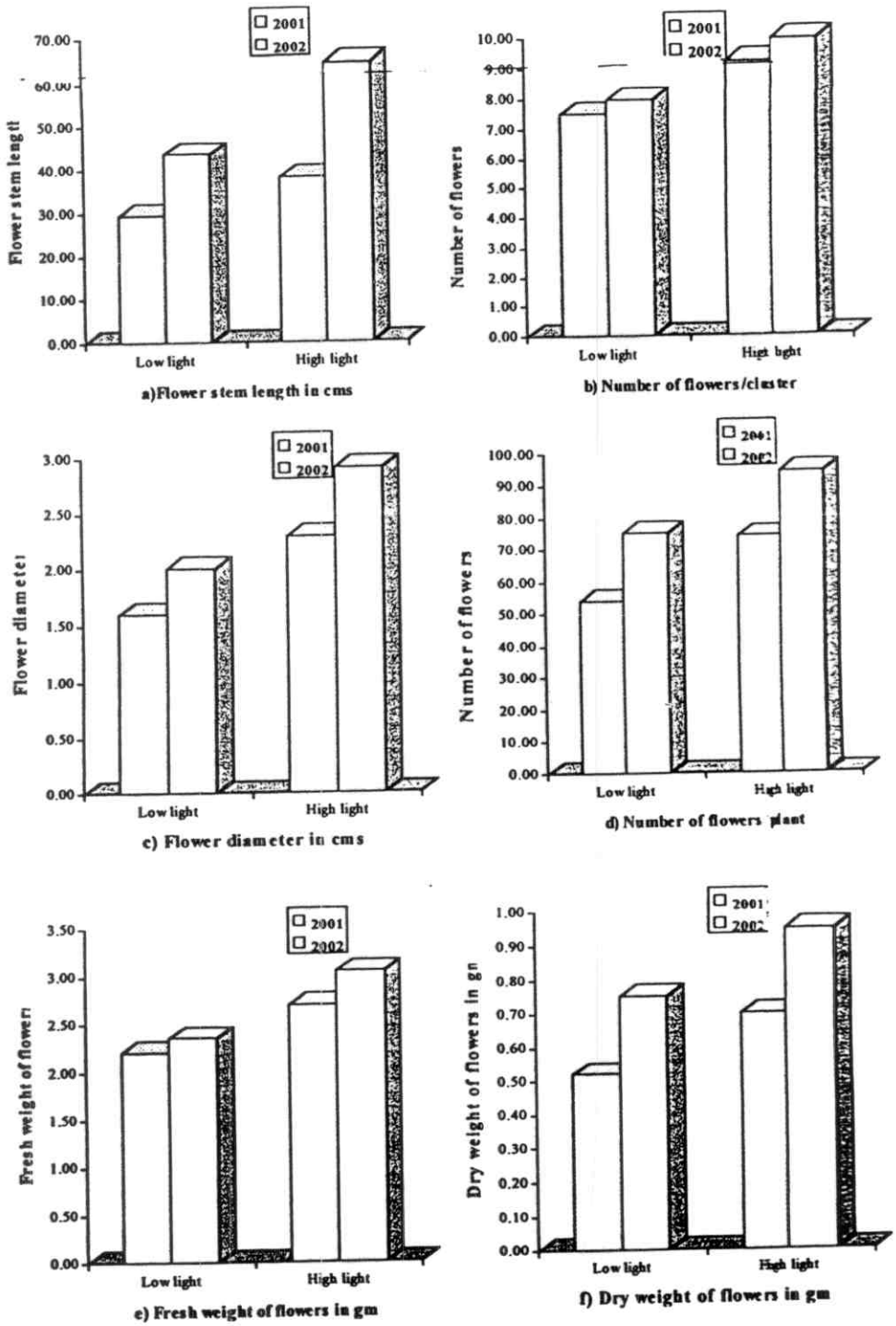


Fig (10) : Effect of two different light intensities on the flowering characters of *Manatee roses* (2000/ 2002).



Cont:Fig (10) : Effect of two different light intensities on the flowering characters of *Manetti roses* (2000/ 2002).

were in agreement with **Carpenter (1972), White and Richard (1973),** and **Armitage and Tsujita (1979),** and **Hick Lentone (1984),** who found that high light intensity and supplementary illumination increased the total fresh and dry weight of flower of roses.

IV-2–F -8- The number of cluster/plant :-

There was a great increment in the number of flowers resulted from the manetti roses grown under full sunlight in both seasons as shown in Table (10) as (74.3 – 94.53), respectively. Meanwhile, lower yield resulted from shaded plant as (54.0 – 75.28) for the two seasons, respectively. The increases were highly significant. These finding were in agreement with **White and Richard (1973), Croenendijk and Rissel (1978),** who found that 1% more light increased flower yield. Also, **Oprel (1979),** on Rosa cv. Sonia who stated that lighting in glasshouse increased the flower yield by 8.6 percent.

The results assure that growing shrub roses either R. poliantha or R. chinensis and. Manetti under full sunlight had the most promising effects on the general growth and especially for landscape of flower borders. Although the two plants could be grown in borders under shade locations but the growth will be partly influnced. It could be mentioned that we grow some different annuals and perennials by distribution them as fillers throughout the first and two seasons and they displayed well for landscaping. The plants were *Tagetes erecta, Chrysanthemum grandiflorum, Calendula officinallis and Freesia sp.*

IV-G- Vegetative growth of Rosa cv. Dorthy Perkins:-

IV-G-1- Plant height (cms):-

With respect to the effect of shading and unshading on plant height, it is evident from data presented in Table (11) that high light intensity significantly at 0.01 level increased the plant height during both seasons as (87.5 – 302.1 cms), respectively. As for the difference between shaded and unshaded plants on plant height was highly significant during the two seasons. The obtained results were in agreement with **Carpenter (1972),**

Vries and Smeets (1978), on Rosa. Also, on contrary with that plant height was increased with increasing shade .

IV-G -2- The number of shoots / plant: -

The shoot number / plant in the open field plantation increased during both seasons with highly significanty level compared with the shaded plants as (4.87 – 15.7) and (5.85 - 33.0) during both seasons, respectively.

These results were in agreement with Armitage and Tsujita (1979), on roses.

IV-G-3- Number of leaves / plant :-

Data in Table (11) presented the great influence of the number of leaves per plants as affected by growing them in the open field especially during the second season as (411.3 – 3510.0) during both seasons, respectively.The difference between shaded and unshaded plants was highly significant increase throughout both seasons .This finding was in agreement with Horn and Huber (1983), on Ficus who concluded that 300 lux affected on dropping and dying of some growing points because they required at least 800 lux.

IV-H- Flowering characters:-

IV-H -1- The number of flower /plant:-

There was a great increase in the number of flowers / plant resulted from plants under the high light intensity compared with shaded plants during both seasons as (53.4 – 400.2) with the first season and (106.9 – 718.8) with the second season.

The difference reached to highly significant level during the two seasons. The results were in agreement with White and Richard (1973), Croenendijk and Rissel (1978), and Oprel (1979), who found that the flower yield of Rosa cv. Sonia was increased by 8-6 percent during winter months in the assimilation lighting in glasshouse.

IV-H -2- Flower diameter (cms) :-

Data in Table (12) reveal that the flower diameter of Rosa cv. Dorthy Perkins resulted from shaded and unshaded plants was clear as shown (5.23 – 5.63 cms) in the first season and (5.15 - 5.68 cms) in the second season.

The difference between shaded and unshaded plants reached to significant level during the first season and highly significant with the second season. As for, **Johansson (1973),** on chrysanthemum who found that lighting the plants in the middle of the night improved the size of flower heads. In addition **Cathey and Campbell (1975),** stated that illuminating plants for 16 h increased the diameter of infloresences.

IV-H -3- The number of petals / flower:-

As shown in Table (12) growing the plants under tree shade decreased the number of petals / flower of Rosa cv. Dorthy Perkins compared with plants grown at open field during the two seasons 2000/2001 and 2001/2002 .

The difference of light intensity effect on the number of petals / flower was significant in between shaded and unshaded had more effect on the number of petals significantly during both seasons.

IV-H -4- Fresh and dry weights of flower in (gms): -

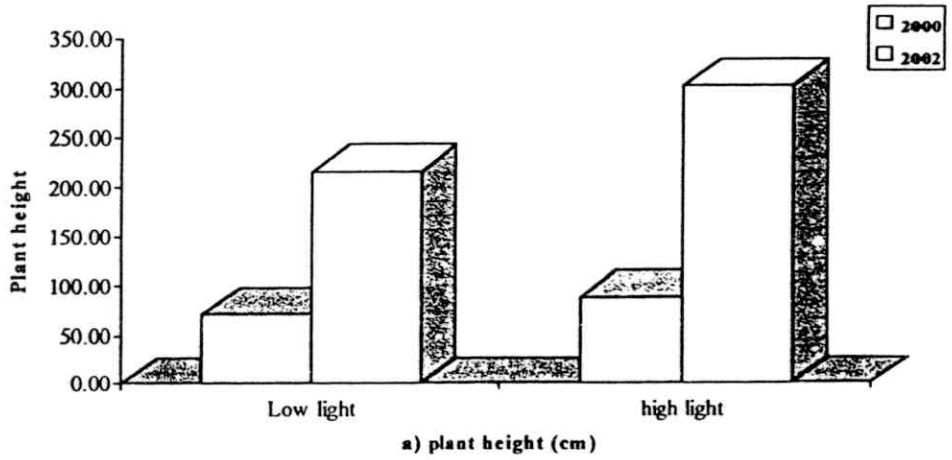
Data in Table (12) showed the considrable influence of the two light intensities on increasing the fresh weight of flower which gave significant increase with the open field plants compared with shaded plant especially in the first season . While, no significant increase on fresh weight resulted from unshaded plant compared with shaded plants during the second season. As for, the dry weight of flowers resulted from open field plantation showed highly significant during first season and significant increase during the second one. These results coincided with those of **Carpenter and Andersson (1972), Armitage and Tsujita (1979),** and **Hick (1984).**

Table (11) : Effect of two different light intensities on the vegetative growth of Rosa cv. Dorthy perkns throughout 2000 and 2002.

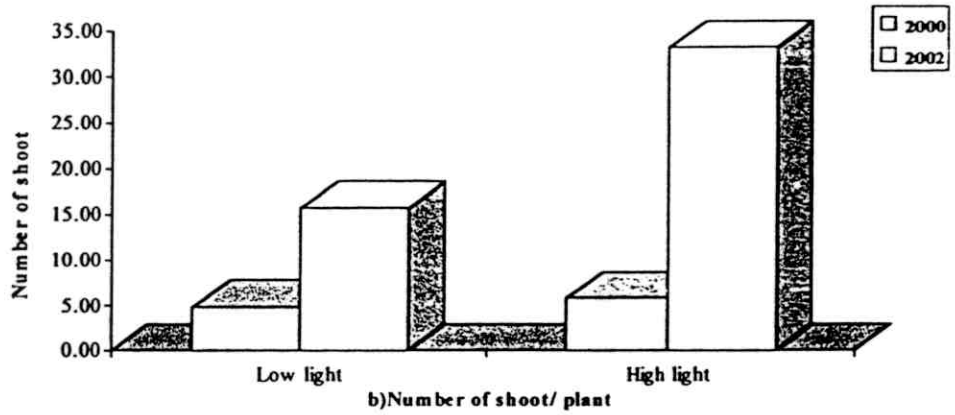
Treatments	2000			2002		
	Plant height cms	No. of shoots/ plant	No. of lvs/ plant	Plant height cms	No. of shoots/ plant	No. of lvs/ plant
Low light	71.00	4.87	403.50	215.50	15.70	2051.00
High light	87.50	5.85	411.30	302.10	33.00	3510.00
L .S.D. at 0.05	3.67	1.22	12.14	14.80	3.09	117.60
L .S.D. at 0.01	5.56	1.85	18.40	22.50	4.68	178.20

Table (12) : Effect of two different light intensities on the flowering characters of Rosa cv. Dorthy Perkins throughout 2001 /2002

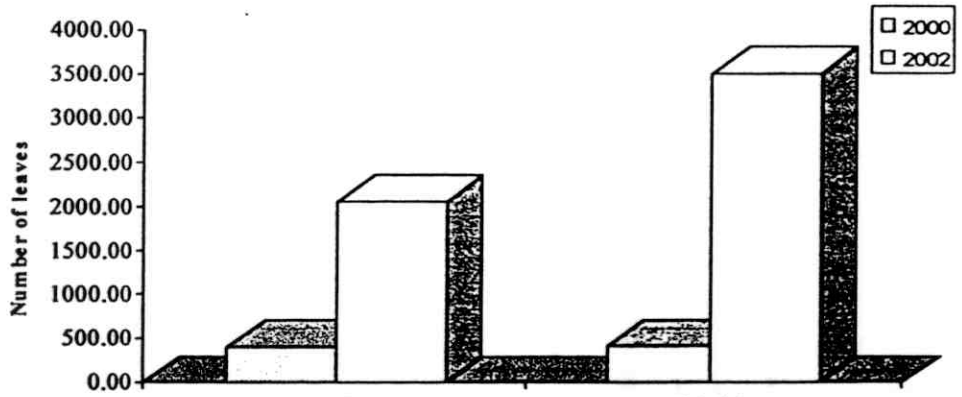
Treatment	2001					2002				
	Fresh weight of flower	Dry weight of flower	Flower diameter	Number of betals/ flower	Number of flower/ plant	Fresh weight of flower	Dry weight of flower	Flower diameter	Number of betals/ flower	Number of flower/ plant
Low light	0.78	0.18	5.23	10.75	53.40	0.78	0.17	5.15	10.95	106.90
High light	0.95	0.20	5.63	12.25	400.20	1.00	0.19	5.68	12.55	718.80
L .S.D. at 0.05	0.13	0.01	0.27	1.10	6.24	0.25	0.01	0.31	0.96	6.73
L .S.D. at 0.01	0.20	0.02	N .S	1.70	9.46	0.39	0.02	0.47	1.45	10.19



a) plant height (cm)

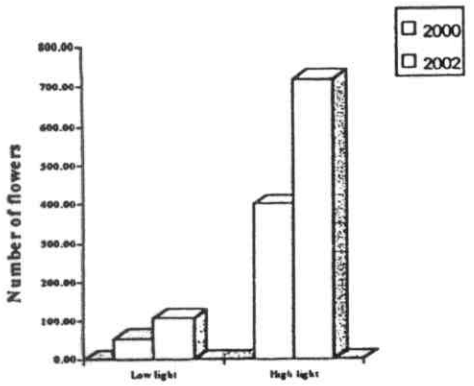


b)Number of shoot/ plant

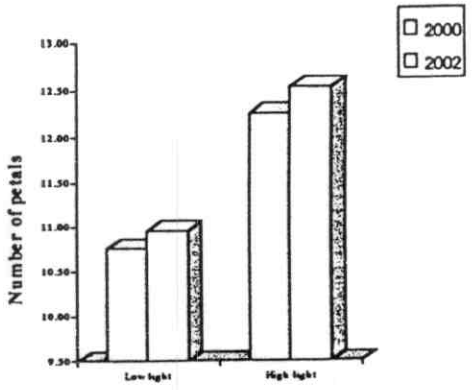


c)Number of leaves/ plant

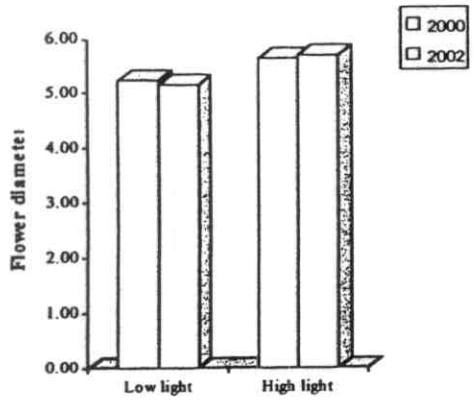
Fig (11) : Effect of two different light intensities on the vegetative growth of Rosa cv. Dorthy perkins (2000/ 2002).



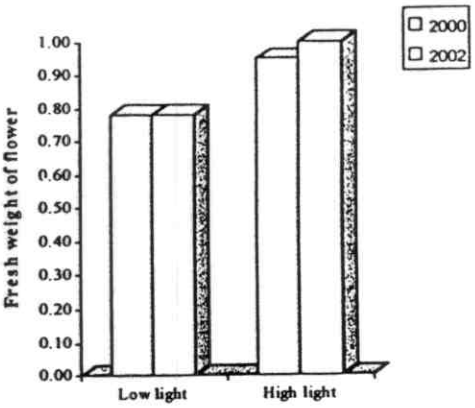
a)Number of flowers/plant



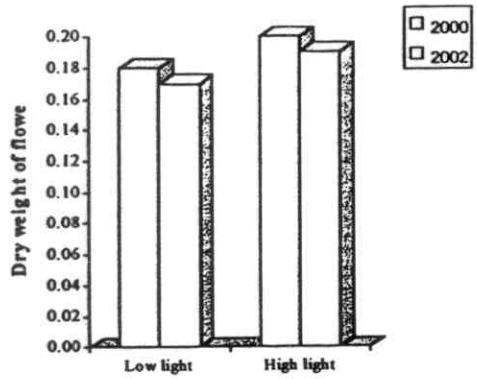
b) Number of petals/flower



c) Flower diameter in cms



d) Fresh weight of flowers in gm.



e) Dry weight of flower in gm

Fig (12) : Effect of two different light intensities on the flowering characters of Rosa cv. Dorthy Perkins (2000/ 2002).

IV-3 EXPERIMENT (3)

IV-3 The effect of thiourea treatments on growing H. T. roses cv. Eeivel Tower:-

IV-3 -A- Vegetative growth:-

IV-3- A-1- Plant height-:

The data in Table (13) and illustrated in Figure (13) show the effect of thiourea levels on vegetative growth of *Rosa hybrida* cv. Eeivel Tower throughout the two seasons (2000-2001) .

There was highly significant increase, resulted from increasing the three concentrations of thiourea on plant height compared to control throughout the two seasons .

Great increase was noticed as an effect of (1000 – 2000 p.p.m) thiourea throughout the first season with average (75.73-76.83 cms) and average (115.80– 126.70 cms) with the second season.

In addition increasing thiourea concentration to the level 4000 p.p.m. gave the lower increase during the two seasons. These results were in agreement with those of **Hore *et al* (1986),** who concluded that the maximum plant spread was obtained with thiourea at 50 p.p.m.

IV-3 -A-2-The number of shoots/plant:-

The Table (13) and Figure (13) represented the number of shoots/ plant affected by thiourea treatments.

The data revealed that the concentration 2000 ppm thiourea was more effective on increasing the number of shoots / plant during the first season. The increase was significant compared with both control (2 - 20) or other concentrations (1000 – 4000 ppm) as shown (2.30 - 2.30), respectively.

The increase in the number of shoots / plant from the different concentrations of thiourea during the second season was promising. However, the difference reached to the level of high significantly in the second season compared to the control (5.55) or each other concentrations, (6.45 – 6.88 – 6.25), respectively.

These results are inaccordance with those postulated by

Dhua *et al* (1987), Tuberose and **El-Shoura *et al* (1992),** on Tomato who found that the assimilation lighting in glasshouse during winter months increased the flower yield by 8-6 percent.

IV-3 -A-3- The number of leaves /plant:-

The effect of thiourea treatments on the number of leaves of Rosa cv. Hybrid tea throughout the two seasons 2000-2002 in Table (13) and illustrated in Figure(13).

The data indicated that the number of leaves /plant were increased due to the thiourea concentrations (1000-2000 ppm) throughout the two seasons. The difference reached to the level of high significant as shown in the first season (71.70 – 74.63) and (204.40 – 214.80) during the second season. Meanwhile, the number of leaves / plant resulted from 2000 ppm thiourea as shown in the two seasons (70.93 - 197.05) was significantly high as compared to the control (63.50 –175.90), respectively. However, the great influence of thiourea on number of leaves / plant was found by **Dhua *et al* (1987),** on *Polianthus tuberose* who concluded that soaking in thiourea 2000 ppm improved plant growth.

IV-3 -B- Effect on flowering:-

IV-3 -B-1- Flower stem length (cms):-

The data in Table (14) and illustrated in figure (14) represent the effect of thiourea on the flower stem length during the two seasons.

Flower stem length values resulted from thiourea treatments were (22.40 and 27.60 cms) compared to the control (20.52 cms) during the first season. While, 4000 ppm thiourea resulted in lower in increasing (21.10 cms) but this increasing unsignificant as comparing with control plants during the firstnseason while highly significant increase (41.48 cms) during the second season.

So, the thiourea concentration 2000 ppm gave considerable increase during the two seasons. These results were in accordance with those of **Dhua (1987),** and **Preeti (1997),** who found that thiourea
promoted the early appearance of flower spikes and promoted

the number of flower spikes but reduced the number of bulbs produced / plant.

IV-3 -B-2- Number of leaves/ flower stem:-

It is evident from Table (14) and illustrated in figure (14) that thiourea treatments had great effect on increasing the number of leaves per flower stem throughout the two seasons. Thiourea significantly increased the values to (5.75 and 6.25) with the increasing the concentrations of thiourea from 1000 to 2000 ppm, respectively during the first season. Whereas, insignificant increase on number of leaves (5.58) resulted from increasing the level of thiourea to 4000 ppm during the first season.

During the second season there are highly significant increase due to increasing thiourea levels. Lower increase on number of leaves / flower stem significantly was due to the high level of thiourea (4000 ppm) during the second season. Meanwhile, the highly significant increase resulted from the medium level of thiourea (2000 ppm) during the second season.

Such result was similarly observed by **Dhua (1987),** on *Polianthus tuberosa* found that thiourea (2000 mg/litre) solution for 6h improved plant growth and increased the yield of spikes and flowers.

IV-3 -B-3-Flower diameter (cms):-

Data obtained in Table (14) show in significant increase on the flower diameter resulted from (1000 – 4000 ppm) thiourea levels. Meanwhile, the increase resulted from 2000 ppm thiourea was significant in both seasons compared to the control.

However, the two rates (1000 – 4000 ppm) of thiourea gave insignificant increase on the flower diameter during the second season compared to the control.

These results were in agreement with those of **Farooqi *et al* (1994),** on *Rosa damancena* and **Dhua (1987),** who stated that thiourea improved the flower quality of tuberose.

IV-3 -B- 4- Fresh weight of flower stem:-

Data obtained on the effect of thiourea rates on the fresh

weight of flower stem during the two seasons 2000 -2002 are averaged in Table (14) and illustrated in Figure (14).

There was a significant increase resulted from the two rates of thiourea (1000 – 2000 ppm) on the fresh weight of flower of stem during the two seasons. The great increase was due to applying thiourea at 2000 ppm throughout the two seasons. Also, **Dhua (1987),** found that thiourea at (2000 mg/litre) was effective in improving flower quality.

IV-3 -B-5 -Dry weight of flower stem:-

Data in Table (14) show considerable increment in dry weight of flower stem resulting from thiourea rates during the two seasons. However, the great increase resulted from applying 2000 ppm thiourea during the two season (3.78 - 6.28), respectively.

With respect to the increment in dry weight of flower stem, there was insignificant among thiourea treatments compared with untreated plants Table (14).

This results may be due to the thiourea effects on the endogenous growth hormones, similar results were obtained by **Farooqi (1994).**

Investigating the effect of thiourea on the growth and flowering of H.T. roses grown under shade had proved possitive influence. The trial gave very promising sighns on both negetative and flowering. The best concentration was 2000 ppm which could be advised for improving the quality of roses when grown in the borders under shade.

***Roses importance of border landscape:-**

Organization of rose groups in such garden depended the above characters on the plant height, dense habit, flowers size also flowers forms and also the purpose in relation to its vertical and horizontal effects on the surrounding.

This led us to some aspects for rose groups which are used in the garden in relation to their position in sunny or shady locations. Thus, the aim of this part of investigation was to evaluate the arrangement of rose beds according to the growth habit of each groups. The concepts of contrast, balance, colour

Table (13) : Effect of thiourea treatments on the vegetative growth of H.T. cv. Eeivel Tower throughout the two seasons (2000/2002).

Treatments	First season			Second season		
	Plant height cms	No. of shoots/ plant	No. of lvs/ plant	Plant height cms	No. of shoots/ plant	No. of lvs/ plant
Control	55.93	2.20	63.50	93.48	5.55	175.90
1000	75.73	2.30	71.70	115.80	6.45	204.40
2000	76.83	2.83	74.63	126.70	6.88	214.80
4000	73.93	2.30	70.93	109.48	6.25	197.05
L .S.D. at 0.05	3.84	0.55	3.18	2.84	0.28	6.86
L .S.D. at 0.01	5.38	0.77	4.46	3.98	0.39	9.61

Table (14) : Effect of thiourea treatments on the flowering charactersof H.T. cv. Eeivel Tower throughout the two seasons (2000/2002).

Treatments	First season					Second season				
	Flower stem length in cms	Number of leaves per flower(cms)	flower diameter in cms	Fresh weight of flower stem(cms)	Dry weight of flower stem(cms)	Flower stem length in cms	Number of leaves per flower(cms)	flower diameter in cms	Fresh weight of flower stem(cms)	Dry weight of flower stem(cms)
Control	20.52	5.23	5.33	7.50	2.70	36.88	6.05	6.08	14.90	5.10
1000	22.40	5.75	5.60	9.20	3.00	45.10	9.53	6.33	16.00	5.45
2000	27.60	6.25	5.85	10.78	3.78	48.25	11.73	6.90	17.56	6.28
4000	21.10	5.58	5.45	7.98	2.97	41.48	7.63	6.30	15.40	5.38
L .S.D. at 0.05	1.51	0.45	0.37	1.11	9.40	2.79	0.21	0.26	1.04	
L .S.D. at 0.01	2.11	0.63	0.52	1.56	9.60	3.91	1.69	0.37	1.46	

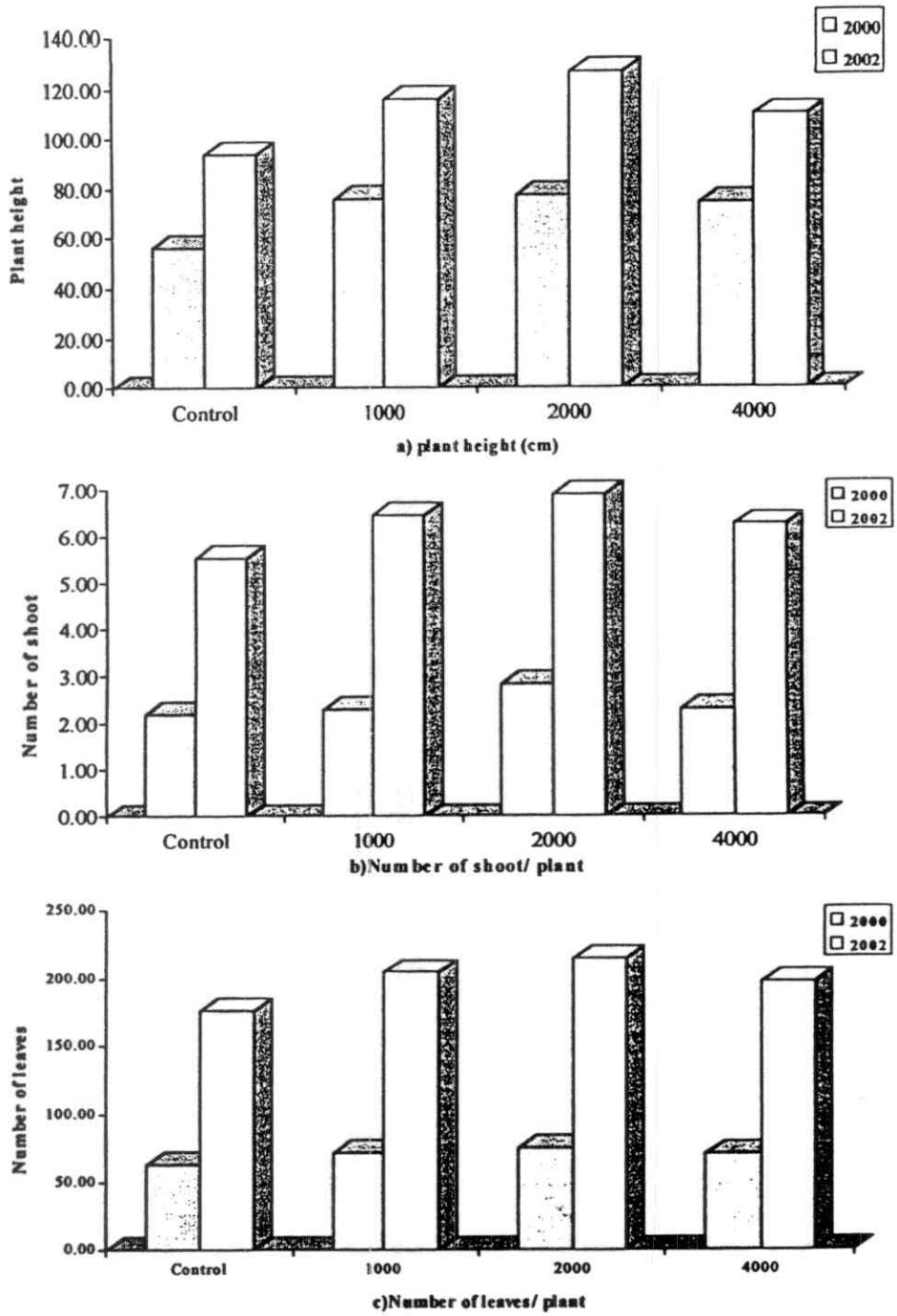


Fig (13) : Effect of thiourea treatments on the vegetative growth of H.T. cv. Eeivel Tower (2000/ 2002).

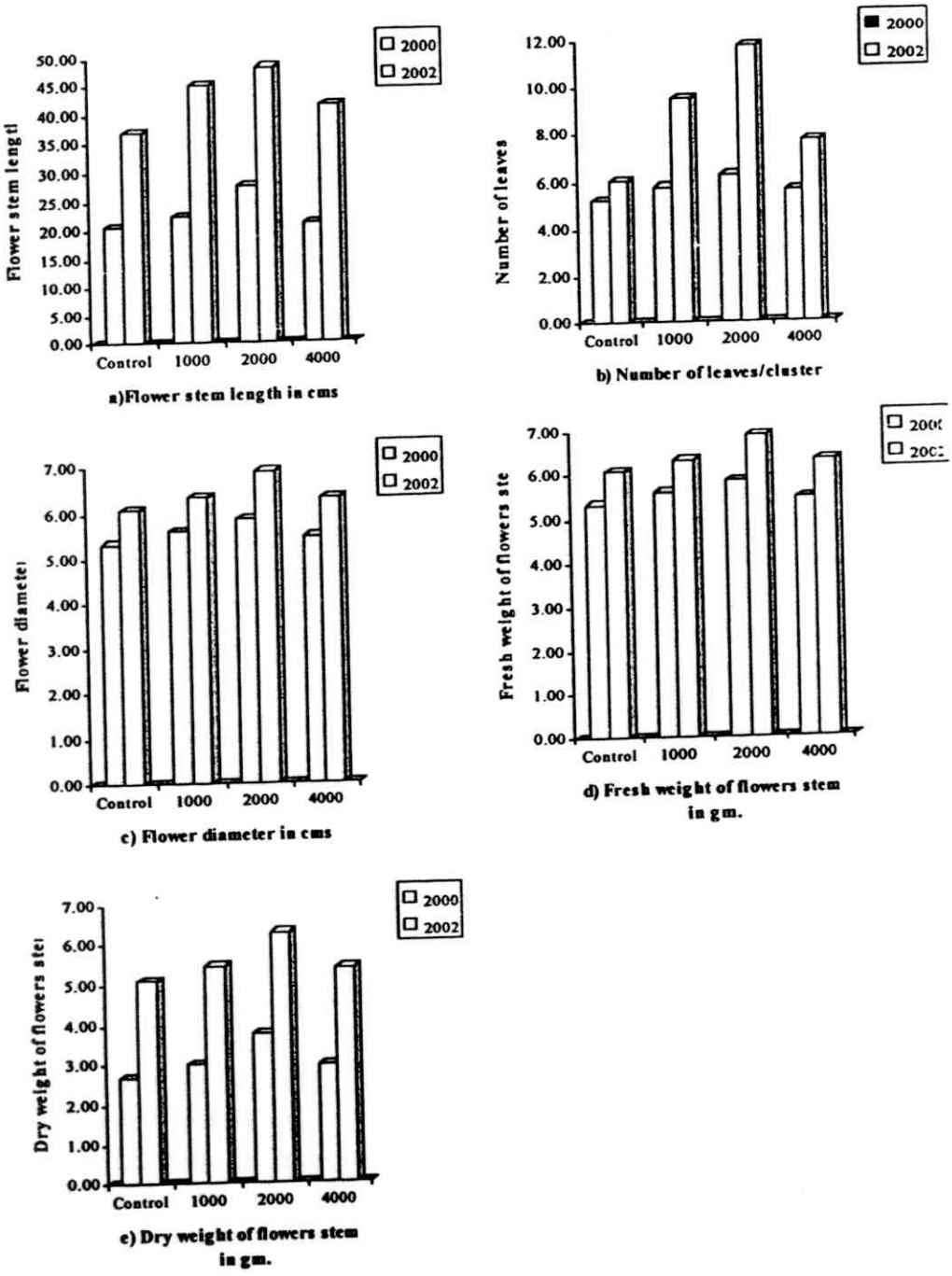


Fig (14) : Effect of thiourea treatments on the flowering characters of H.T. cv. Eeivel Tower (2000/ 2002).

and the contribution of climber roses in the garden were also included. Figure (A) show general view of the layout which was carried out under shadding area 22 m in length 4.5 m width to create 4 beds. The east side of each bed was planted with 13 plants of Manetti roses, which the west side planted with 7 plants (one year old) of Polyantha roses plant. On the other hand, 6 plants of Hybrid Tea cv. Chlysler were planted on chard shape, Two climber plants of Dorthy Perkins and two plants of Rosa bankisia were planted in every side of shadding bed. The same design was carried out in other sunny location.

-Plant height:-

In studying the relationships of the plant height of rose groups growing under low light intensity comparying with the plants growing in open field, both data in Table (15) and personal table score suggested that both the two climbers plants of Rosa cv. Dorthy Perkins and Bankisia roses growing in full sunlight were taller than these growing in shady location. White the height of Manetti roses decreased under full sunlight condition. As well as Polyantha roses were not affected by the low light intensity. These results are in agreement with those of **James (1984),** who found that rose plants do best when grown under full sunlight or at least under six hours sun / day.

On the other hand, the distribution of rose groups as the plant height under sunny location obtained 8.9 point score, compared to 7.0 point during the golden stage of the development of rose beds. In this concern, **Barbara (1990),** reported that, Hybrid Tea roses the most common roses grown tody gradually gained in popularity because of their long season of bloom and the beauty of their unfurling buds, while Manetti roses are excellent as edging plants. While, **Helen Parker (1996),** reported that, the traditional rose garden with formal beds laid out in geometric precision is still a popular means of displaying roses. She added that, many modern cultivars with their long flowering period, elegant blooms and strongly upright habit, are especially suited to the classic elegance of formal planting.

-Layout of the flower border :-

-The flowering area:-

Fig (A) and Photo (1) show the effect of shade and sunny location on the growth and flowering of same rose groups i.e. Manetti, Polyantha, Hybrid Tea, Rosa bankisia and Rosa cv. Dorthy Perkins.

Data in Table (15) show the contribution of those groups on the orientation of formal rose beds, it is quite clear that each plant of Manetti rose growing in full sunlight produced about 74.3 flower in first season while the plant produced 97.4 flowers in second season. It means that every Manetti rose plant added 0.03- 0.06 m2 flowering surface area when the plant was planted in sunny location while, placing the same plant in shady location produced only 54.0 flowers in the first second and 75.3 flowers in the second season. Accordingly the contribution of Rosa manetti in shady location was decreased than in sunny location.

Consequently, as a calculation data, all Manetti roses plant in each bed (13 plant) will create 0.81 m2 as surface flowering area in sunny location compared to only 0.31 m2 shaded one as low flowering edge a round the formal roses bed.

The contribution of Polyantha roses in formal bed were more great than Manetti rose because each plant growing in sunny location produced 138.0 flowers in the first season and 161.8 flowers in the second one compared to 101.0 flowers in the first season and 107.3 flowers in the second season for the plant growing in the shady location.

Thus, it could be concluded that Polyantha rose plant grown in the sunny location shared by about 0.16 m2 as a surface flowering area compared to 0.04 m2 for the plant grown in the shady location. Polyantha rose plant in sunny location produced 1.089 m2 as a surface flowering area which in shady location produced only 0.286 m2 as a surface flowering area in each bed.

The designer placed two climbers roses of *Rosa bankisia* and two other ramblers roses of Dorthy Perkins in the central part of formal beds which appeared a great pyrmidical charming shape in the central part of rose flowering bed, since

placing Bankisia plant in sunny location produced 609.4 flowers in out of all season which created 0.840 m2 as a surface flowering area in the space of sunny location in the garden compared to only 0.09 m2 for shadded one. While, Dorthy Perkins produced 718.8 flowers per year which added 1.82 m2 as a surface flowering area in sunny location. While the same plant produced only 106.9 flowers which added 0.22 m2 as a surface flowering area under the shade condition.

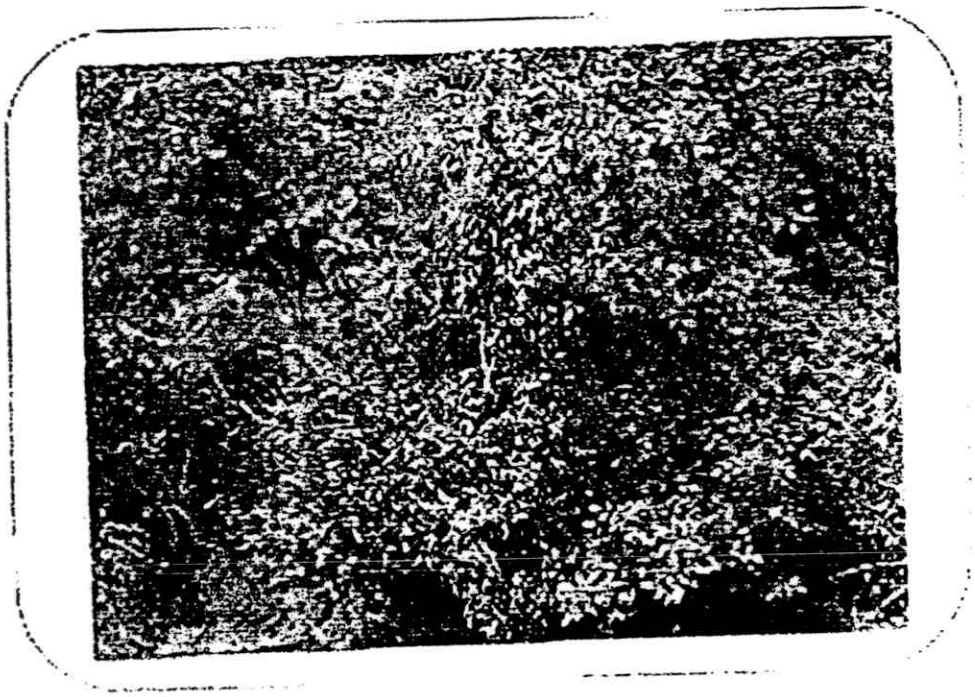
In fact, the pyrmidical shape of flowers act as a dominant element to function a dynamic piece seen from different sides of design the border and attracting the attention of the garden visitors. This charming shape obtained the highest point score as (9.29) for sunny location by the personal test which was carried out during the peak of flowering (golden stage) compared to (6.7) points for the shady location.

Table (15) : Comparison of plant height, flowering surface and table scores on *Mantti roses*, *Pollantha roses*, Dorthy Perkins and *Rosa bankisia*.

	Plant height in cms		Flowering surface			
	Low light	High light	Low light		High light	
			First season	Second season	First season	Second season
Manetti roses	26.80	21.05	0.01	0.02	0.03	0.00
Pollantha roses	4297.00	42.83	0.03	0.04	0.13	0.16
Dorthy Perkins	71.00	87.50	0.11	0.22	1.00	1.82
Rosa bankisia	92.43	99.63	0.04	0.09	0.45	0.84
Table scores	7.00	8.90	6.70		9.29	

Rosa Dorthy Perkins
(Shade)

Rosa Dorthy Perkins
(Light)



Rosa Manetti

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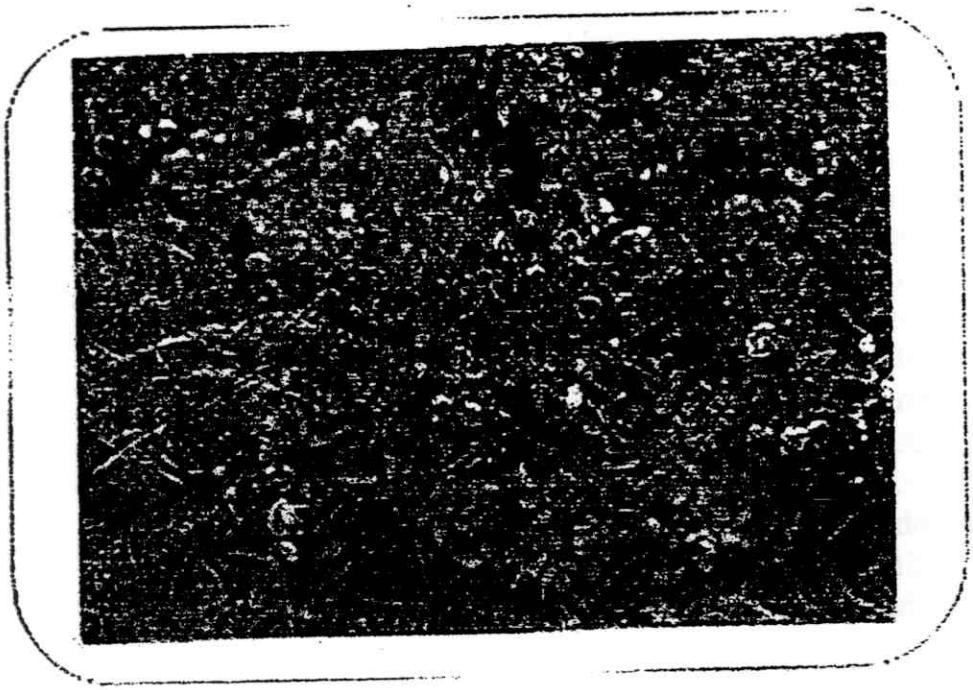

Rosa Poliantha 84