SUMMER PRUNING OF GREENHOUSE-GROWN ROSES (CV. 'MERCEDES')

Raviv Michael, et al. 1984. Hassadeh 65(4):742-745.
Translated from the Hebrew by David Saltz

The height and time of summer pruning of greenhouse-grown roses (cv. 'Mercedes') were examined as to their effects on the winter harvest. Also studied was the interaction between the height of first pruning (in May) and the cutting procedure (cutting up versus under cutting) during the first two cutting periods (October and January). It was found that postponing the first pruning to July increased plant productivity whereas severe pruning in May, combined with under cutting had an adverse effect on productivity. Gradual pruning was found to be preferable to hedge pruning.

Summer cutting from May to mid-July, followed by high pruning (120 CM) in July, increased plant productivity, as compared to hedge pruning in May followed by additional pruning in July.

Introduction

Roses for export have been grown in Israel for more than twenty years. In most countries where greenhouse roses are grown, cutting is carried out the year round. This does not apply in Israel. The export season lasts from the beginning of October to the end of April. During the summer there is almost no organized marketing of flowers, and no regular picking. The rose growers must care for the plants during the summer in such a way as to allow for producing the largest number — and the best quality — of flowers during the market season, i.e., in winter. In order to attain this goal, various summer management procedures have been examined. Zieslin and Mor (3) have shown that there

was no difference in the harvest of rose (cv. 'Baccara') when selective pruning was carried out to the height of 90-120 cm., as compared to mechanical hedge pruning to one meter height. Advancing the first pruning to May 20th decreased the harvest as compared to other, later prunings, and, in fact, the later the pruning took place, the better the winter harvest turned out. Severe spring (April 25) pruning (20-25 cm.) had an adverse effect on the harvest, in comparison with more moderate pruning (60-70 cm.), and an ever better result was achieved by pruning to 110-120 cm. The authors concluded that for flower winter production a maximum accumulation of photosynthates is necessary during the summer.

In spite of these results, it is not customary among rose growers to allow the plants free flowering during the summer. The reasons for this are, apparently, the thick growth which makes it difficult to move around in the greenhouse increases attraction of diseases and pests, decreases the spray effectiveness, and shading, which causes leaf drop in the canopy. A further reason for pruning is timing the greatest harvest flowers at the most convenient period.

The experiments described in this paper were aimed at examining the customary procedures in the Israel valley, as compared to management procedures that allow for a greater quantity of foliage for longer periods of time during the summer. Once the export season was over (end of April — beginning of May), the plants were left untended (cutting, pruning, etc.) for a few weeks. Towards the end of May, hedge pruning was carried out to the height of about 80 cm. from ground level. Further prunings were performed in July and August, or in September, usually to half the height of the branches that had broken out. The last pruning was used for timing the flowering date. About 30 days usually pass from the pruning day to the day the cutting begins, if this day falls in the beginning of October.

At about the same time that this series of experiments commenced, a method of soft summer pinching was introduced at the initiative of one of the authors of this paper, Z. Avigdori (1,2). This method lengthened the period of time between the last pruning and cutting to about 40 days in this season. It also resulted in flowers which were 6 to 8 cm. longer, thus upgrading their classification and their price with relatively small work input.

Study Design

Roses (cv. Mercedes) were planted in the Newe-Ya'ar greenhouse towards the end of September 1980, in volcanic scoria. The size of each bed was one meter in width and 3 meters across. The bed was covered by black polyethylene. Each bed was planted with 30 plants, a density which may be compared with planting 4800 plants per 1000 sq.m.

The experiments were set up in a random block. Each block included one rose bed from every treatment, totaling 5 treated beds.

Experiment A

This experiment was conducted during the 1982/83 season. It examined the effect on the number, length and weight of flowers, of the height and time of summer pruning, as well as the cutting methods in periods A and B (Table 1). Pruning for timing was done above the second from top 5-leaflet leaf.

Table 1: Different treatments given to roses cv. 'Mercedes' in the 1982/83 season.

Definition of treatment	Pruning to 50 cm. under hook cutting	Pruning to 50 cm. cutting up	Pruning to 80 cm. cutting up	Pruning to 80 cm. cutting up (control)	Gradual pruning in May	Pruning in July to 120 cm.	Gradual pruning in July to 120 cm.	Summer pruning up to July
May 1982	Pruning to 50 cm.	Pruning to 50 cm.	Pruning to 80 cm.	Pruning to 80 cm.	Gradual pruning during the month to 80 cm.			Under cutting
June 1982	—	—	—	—	—	—	—	Under cutting
July 1982	Pruning young growths to half their height					Pruning to 120 cm.	Gradual pruning to 120 cm.	Pruning to 120 cm.
Aug. 1982	—	—	—	—	—	—	—	—
Sept. 1982	Pruning for timing and soft pinching							
Oct. 1982	Begin. under cutting	Begin. cutting up	Begin. under cutting	Beginning cutting up				
End of Oct. 1982	Soft pruning of young shoots							
Nov. 1982-Jan. 1983	Under cutting	Cutting up	Under cutting	Cutting up				
February-April 1983	Under cutting in overall area							

Experiment B

The effect of summer cutting as a commercial management method was examined again in the 1983/84 season (Table 2).

Results and Discussion

The results (Table 3) showed that under cutting in May decreased plant productivity as compared to a higher pruning in the same month. Postponing the pruning to the month of July increased plant productivity even more, as reflected in the overall height obtained throughout the winter. Gradual pruning led to further improvement. Postponing the pruning from May to July in bush type 'Mercedes' did not cause crowding, and should be considered a preferred treatment.

Although the amount of plant matter removed from the plants was no less than that removed in May pruning to 80 cm., the flowers picked during winter, though their quantity was similar, weighed 12 percent more than flowers that underwent the second treatment (May pruning to 80 cm., cutting up). This addition in weight was reflected significantly in flower quality.

There was a connection between the height of summer pruning and the winter cutting method. Following severe pruning, under cutting did contribute to flower length in periods A and B, and this was reflected at the end of the season as well (Table 3). However, this had an adverse effect on the yield. This finding verified earlier findings regarding other rose cultivars (Table 4). It is possible that a combination of relatively late gradual pruning and under cutting at the beginning of the season could contribute to producing longer flowers without significant reduction in the quantity and quality.

Low summer pruning resulted in a decrease in the number of flowers produced in mid-season, as compared to the

Table 2: Treatment given to roses cv. 'Mercedes' in summer 1983.

Definition of treatment	Control (May pruning)	Summer cutting
May	Hedge pruning to 80 cm. (May15)	Continued under cutting up to pruning time in July
June	———	
July	Pruning to top perfect leaf (May 17)	
August	———	
September	Pruning for timing to second from top perfect leaf (Sept. 1) Soft pinching (Sept. 15)	
October	Beginning of cutting Oct. 2	

Table 3: Different harvest parameters as affected by pruning and cutting treatments in cv. 'Mercedes' during the 1982/83 season (Experiment A).

Treatment	Number of flowers per plant 10/1/82-4/29/83	Average no. of flowers in mid-season 11/13/82-3/12/83	Average length of flower, (cm.)	Average weight of flower, (grams)	Weight of total flowers per plant, (grams)
Pruning to 50 cm., under hook cutting	36.0a	14.1a	46.6b	8.15a	573a
Pruning to 50 cm., cutting up	39.9b	14.3a	42.6a	15.0a	506a
Pruning to 80 cm., under hook cutting	41.5b	16.2b	46.3b	15.9a	662b
Pruning to 80 cm., cutting up (control)	42.3b	16.6b	43.8ab	15.4a	653b
Gradual pruning in May	41.4b	15.8b	43.3ab	15.7a	648b
Pruning in July to 120 cm.	40.4b	16.3b	45.5b	16.9b	686b
Gradual pruning in July	41.3b	17.4c	64.0b	18.0b	747c
Summer cutting up to July	40.5b	16.2b	45.6b	18.1b	734c

Numbers followed by different letters differ from each other in their level of significance P = 0.05.

Table 4: Various harvest parameters as affected by summer cutting of cv. 'Mercedes' in 1983/84 season (Experiment B).

Treatment	Average no. of flowers per plant 10/2/83-4/30/84	Average no. of flowers in mid-season 11/12/83-3/2/84	Average length per flower, (cm.)	Average weight per flower, (grams)	Weight of total flowers per plant, (grams)
Control (May pruning)	45.0±1.04	22.0±0.65	43.4±0.80	15.2±0.52	684.0
Summer pruning	14.8±0.65	27.4±1.05	43.0±0.31	14.8±0.65	787.4

control group, while gradual pruning in July resulted in a greater concentration of flowers during the high-price season.

Summer pruning was examined again in the 1983/84 season. It was found that, in the period of time between the end of picking for export and pruning (July 17, 1983), 25.5 additional flowers per plant were picked, of which 18.2 flowers were longer than 40 cm., which has been set as the lower quality breakoff point.

During the summer, there was a gradual decrease in quality, which was reflected in the length and average weight of the flowers, as well as in the rate of flowers longer than 40 cm. (Table 4).

In the second season as well, the productivity of plants harvested during the summer was larger than that from plants first pruned in May. However, plant reaction differed from the previous season, and the addition was reflected in the number of flowers, without effecting their quality (length, weight).

It is important to add that preliminary testing of summer cutting was performed in the 1981/82 season, when 43.2±0.2 flowers per plant were picked. Their average length was 47 cm. in the summer cut treatment, versus 39.0±1.7 flowers per plant, with an average length of 44 cm. in the control treatment.

It is clear that summer cutting does not harm the winter harvest. Growers who are able to market these flowers cost-effectively, can do so with little fear. A possible explanation for this finding has to do, apparently, with the fact that the foliage removal in this treatment was gradual, and over a long time. By the time the pruning date arrived, the plants were once again covered with foliage.

In conclusion, it appeared that in greenhouse-grown roses (cv. Mercedes), it is best to forego completely spring pruning, and to choose one of the following options: cutting for market in the months of May to July, or gradual pruning in July.

Literature Cited

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FORT COLLINS GREENHOUSE CLIMATOLOGICAL SUMMARY FOR FOUR WEEKS, BEGINNING NOVEMBER 30, 1986
(See Bulletin 426 for details.)

	Week beginning							
	Nov. 30		Dec. 7		Dec. 14		Dec. 21	
	Day	Night	Day	Night	Day	Night	Day	Night
Average outside temperature (°F)	34	30	28	30	60	26	38	26
Maximum outside temperature (°F)	54	50	42	50	82	41	50	37
Minimum outside temperature (°F)	22	17	2	17	31	12	25	14
Degree-days of heating	217	245	259	245	35	273	189	273
Average hours in the period	8	16	8	15	8	16	7	16
Accumulated total solar radiation (MJ/sq.m.)	44.5	—	48.9	—	95.3	—	50.7	—
Average relative humidity (%)	65	73	69	86	59	71	45	68
Maximum relative humidity (%)	94	99	96	100	100	90	66	86
Minimum relative humidity (%)	36	34	38	61	16	50	15	46
Average absolute vapor pressure (mb)	4.3	4	3.5	3.2	10.5	3.4	3.5	3.2
Average wind speed (mph)	3	2	2	0.4	1	0.2	0.9	0.2
Maximum wind speed (mph)	43	29	19	9	14	9	7	7
Average CO_2 concentration (Pascal)	26	—	28	—	20	—	27	—
Maximum CO_2 concentration (Pascal)	35	—	41	—	44	—	42	—
Accumulated gas consumption (cu.ft./sq.ft.)	35	80	39	93	7	85	22	89

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