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## Pruning and Development of Roses

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The primary objective in pruning greenhouse roses is to reduce plant height thereby renewing the top branches. Another objective may be to reduce or eliminate production when roses are in oversupply. The two common systems of pruning are the gradual or 'knife' method and the complete cut-back. Plants pruned gradually are out of bloom for a shorter period, hence usually produce more flowers for the year. The cut-back requires pinching similar to that used on new plants before flowers are again harvested.

A modification of these pruning methods has been suggested by the work of Kohl et al. (1 to 7) in California. Kohl and his coworkers found that sugars produced by rose leaves are translocated to developing flower buds until the last few days before the flower is cut. When flowers are harvested continually, only a small part of the sugars manufactured by a rose plant are moved to the older stems so they are available as food to support renewal growth. On the basis of this information, Kohl, Smith and others suggested allowing periods for 'flowering out' in the development of young plants by time pinching, or in renewal pruning. Allowing the roses to mature on the plant increases the time sugars would be translocated from their leaves downward to the more mature parts of the plant. Theoretically this sugar storage would contribute to either renewal canes or to stronger branching.

In order to compare gradual and cut-back pruning and to test the value of 'flowering-out' on the rate of

development of pruned roses, three varieties were pruned as follows: 1) gradual pruned from mid-June to late July, 2) cutting of flowers was stopped June 20, plants cut back June 26, and 3) flowers cut to July 11 and plants cut back the same day. These were designated P1, P2, and P3, respectively. Two methods of developing the plants after pruning were superimposed on the pruning treatments. All new returning branches were soft-pinched once in D1, while D2 consisted of allowing all new branches to mature their flowers to approximately petal fall before they were removed to a good 5-leaflet eye. On weaker branches this bud occurred in the axil of the top 5-leaflet. On more vigorous canes the eye selected was in the axil of the second 5-leaflet leaf.

Three cultivars, Forever Yours, Town Crier and Bridal Pink contributed an equal 231 sq. ft. of bed area each to the planting used for this experiment. There were 3 pruning treatments, 3 cultivars and 2 development treatments.

### Results

Flowers were cut daily and graded by 3-inch stem increments. All treatments began light production the first week in September and the experiment was terminated June 3, 1972. Table I gives a summary of the data obtained for the year (Sept. through May) with flowers from all varieties lumped together. Differences between pruning treatments were larger than for development treatments.

Table 1. Yield and grade of 3 cultivars of greenhouse rose from 3 pruning and 2 development treatments.

Treatment	Stem length — inches						Total yield	Ave. stem lgth	
	9	12	18	18	21	24			27
Pruning <sup>a</sup>									
P1	335	721	1166	1135	691	361	186	4595	16.9
P2	428	782	1138	1159	746	380	199	4832	16.8
P3	578	989	1438	1282	722	324	184	5517	16.2
Development <sup>b</sup>									
D1	665	1214	1873	1880	1127	542	277	7578	16.7
D2	676	1278	1869	1696	1032	523	292	7366	16.6

<sup>a</sup>Yields from 6 plots — 231 sq. ft. of bench area

<sup>b</sup>Yields from 9 plots — 346.5 sq. ft.

The largest yield came from P3 where flowers were cut to the day plants were pruned. Average stem length for this treatment was reduced but number of flowers in the longer grades (18" to 27") were almost equal. The increase in yield for P3 was in the shorter grades. There was no advantage to flowering out one week prior to cut-back (P2). Gradual pruning (P1) produced almost 20% less than P3 but the gradual method allows the crop that is harvested during pruning to be marketed. In this case 2 more flowers per sq. ft. were taken from the plants in the P1 treatment from mid-June to late July compared to those cut from P3 up to July 11. This was not enough to compensate for the increased postpruning yield from P3.

The three varieties did not react to the pruning and development treatments in the same way (Table 2). Forever Yours produced best with either cut back

method (P2 or P3) but was distinctly better with the D1 treatment. Both Town Crier and Bridal Pink produced better when flowers were produced up to the day plants were cut back (P3). The development treatment used on these two cultivars made very little difference. Total yield for the cultivars was also quite different under the conditions of this experiment. Yields per sq. ft. of bench area were 19.3 for Forever Yours, 15.4 for Town Crier and 25.2 for Bridal Pink over the period from July pruning to June 3 the following year.

### Winter Production

One of the questions always uppermost in a rose grower's mind is 'How do pruning treatments and timing of the pruning operation affect the next

Table 2. The effect of 3 pruning and 2 development methods on the yield of 3 cultivars of greenhouse roses.

Treatment	Cultivar		
	Forever Yours	Town Crier	Bridal Pink
Pruning <sup>a</sup>			
P1	1353	1043	2199
P2	1577	1120	2135
P3	1527	1387	2603
Development <sup>b</sup>			
D1	2321	1818	3439
D2	2136	1732	3498

<sup>a</sup>Yields from 6 plots — 231 sq. ft.

<sup>b</sup>Yields from 9 plots — 346.5 sq. ft.

winter's production?' Results of the treatments were tabulated for the period Dec. 5 to Feb. 12, a 10-week period when markets are predictable. The three pruning treatments produced equal results although flowers from P3 averaged ½" shorter stems. Allowing the growths to flower out (D2) produced 17% more flowers during this winter period only. This reaction to developmental method was shown by Forever Yours and Town Crier; not by Bridal Pink.

## Discussion

Several questions were to be answered by this experiment. Is there an advantage to gradual pruning compared to the complete cut-back or 'haircut' methods? These results indicate that there is none. More and better trained laborers are required for gradual pruning. In this experiment only two more flowers per square foot were produced in the period of pruning than were produced by P3. The return on these two or even four summer flowers probably would not pay for the additional pruning labor, even if it were available. Flowering out before pruning (P2) had no advantage over cutting flowers up to the day plants were pruned.

The question on soft-pinching vs. flowering-out in the development of rose plants following pruning was answered by results shown in Table 1. There was a slight advantage for the flowering-out method on yield but not grade during the winter period. This was not true for the complete year, Table 1.

In planning a schedule for pruning operations the major question deals with how much time plants are out of production when pruned in various ways. The time out of production is minimal when the plants are pruned in summer. Plants gradually pruned in this experiment were out of production from five weeks for Forever Yours to seven weeks for Town Crier and Bridal Pink. Plants pruned by the P3 method were out of production ten weeks and those by the P2 method by eleven weeks.

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