



# Colorado Flower Growers Association

IN COOPERATION WITH COLORADO A & M

Bulletin 40

Secretary, Ray App

February 1953

4434 Lowell Blvd., Denver, Colo.

COLORADO'S THIRTEENTH ANNUAL SHORT COURSE-----March 17, 18 and 19

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## CARNATION TIMING FROM SECOND PINCHES

by W. D. Holley and David L. Wagner

Pinching carnation plants a second time reduces total production but is a valuable means by which production can be redistributed to more profitable periods. By reducing the number of flowers cut in summer and fall and raising winter and spring production, over-all quality is improved.

Described elsewhere in this article are 13 cropping systems involving solid or staggered second pinches. The numbers on each treatment refer back to other data published on these same studies (CFGA Bul. 29). All treatments occupied producing benches for 51 weeks. All treatments except 14, 15, 17, and 18 also required nursery beds for 8 weeks. Three randomized plots of 35 carnation plants each were used per treatment. The total production for each treatment (105 plants occupying 35 sq. ft. of bench area) is presented for comparison in Tables 1, 2 and 3. Spacing used in all treatments was 6" x 8".

Solid Pinches.---The following cropping systems were designed to test the influence of solid pinches on quality and the distribution of production. Only shoots that had cleared side breaks were pinched, hence a solid second pinch included approximately 3/4 of the shoots on each plant.

6. Propagated Feb. 10, nursery bed Mar. 10, pinched April 15, benched May 18, solid second pinch June 20.

12. Propagated Mar. 15, nursery bed Apr. 15, pinched May 15, benched June 15, solid second pinch July 20.

13. Propagated Mar. 15, nursery bed April 15, pinched May 15, benched June 15, solid second pinch Aug. 15.

15. Propagated Apr. 15, benched direct May 18, pinched June 15, solid second pinch Sept. 19.

18. Propagated May 15, benched direct June 15, pinched July 15, solid second pinch Oct. 15.

### IN THIS ISSUE

-----  
Carnation Timing from  
Second Pinches

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Branching of Young  
Plants

A comparison of quality (Table 1) was obtained by weighing all flowers after side growths had been removed. Weak-stemmed blooms were broken down to lower grades before being weighed.

Table 1. -- The total production and quality of carnation from 5 solid-pinned cropping systems.

Treat. number	Var. /a.	Production		Quality				
		Total	Per ft. <sup>2</sup>	Split	Short	Stand	Fancy	Q.I. /b.
6	RS	1095	31.3	9	54	342	690	4.56
12	PS	1312	37.5	13	11	463	825	4.60
13	PS	1251	35.7	5	22	254	970	4.75
15	WS	1168	33.4	6	69	433	660	4.50
18	PS	1109	31.7	10	11	340	748	4.65

/a. Varieties used were Red Sim(RS), Crowley's Pink Sim(PS), and White Sim(WS).

/b. Q.I. (Quality Index) determined by assigning the following numbers to the grades: splits = 2, shorts = 3, standards = 4 and fancies = 5. These numbers are multiplied by the production of each treatment in each grade and the total is divided by the total production of the treatment. A difference of 0.10 in the Q.I. is a real difference.

The smaller production and quality of treatment 6 was due for the most part to variety (Red Sim). Treatments 12 and 13 (Pink Sim) were high in production, 13 having the highest quality. Treatment 15 (White Sim) produced the poorest quality because of a large crop just following January (Fig. 1). The reduced production evident in treatments 15 and 18 is a real difference which was probably due to late pinching.

How 5 successive solid pinches at monthly intervals affected the distribution of carnation production is shown in Fig. 1. The production peaks are less evident from solid pinches made during the early summer. The later a solid pinch is made, the more tendency there is for production to be bunched. The solid pinch of Sept. 19 produced an extremely large crop in February and March, just following the shortest days of winter. This caused considerable weakness in the crop which shows as reduced quality in Table 1. The solid pinch of October 5 bracketed the Easter-Mother's Day period. In general, one and a half crops were obtained from the pinches made in June, July and August and one crop from the September and October pinches.

Staggered Half and Half Pinch. -- The following cropping systems were designed to study the effects of staggered pinching. The two most advanced shoots were pinched on each plant, then one month later two more shoots were pinched. Total production and quality from these four treatments are shown in Table 2.

4. Propagated Feb. 10, transplanted to nursery bed March 10, pinched April 15, benched May 18, second pinched two shoots per plant on June 15, two on July 15.

11. Propagated Mar. 15, transplanted to nursery bed April 15, pinched May 15, benched June 15, second pinched two shoots per plant July 15 and two Aug. 15.

14. Propagated Apr. 15, benched direct May 18, pinched June 15 and second pinched two shoots per plant Aug. 15 and Sept. 19.

17. Propagated May 15, benched direct June 15, pinched July 15 and second pinched two shoots per plant Sept. 19 and Oct. 15.

# SOLID PINCHES ON CARNATIONS

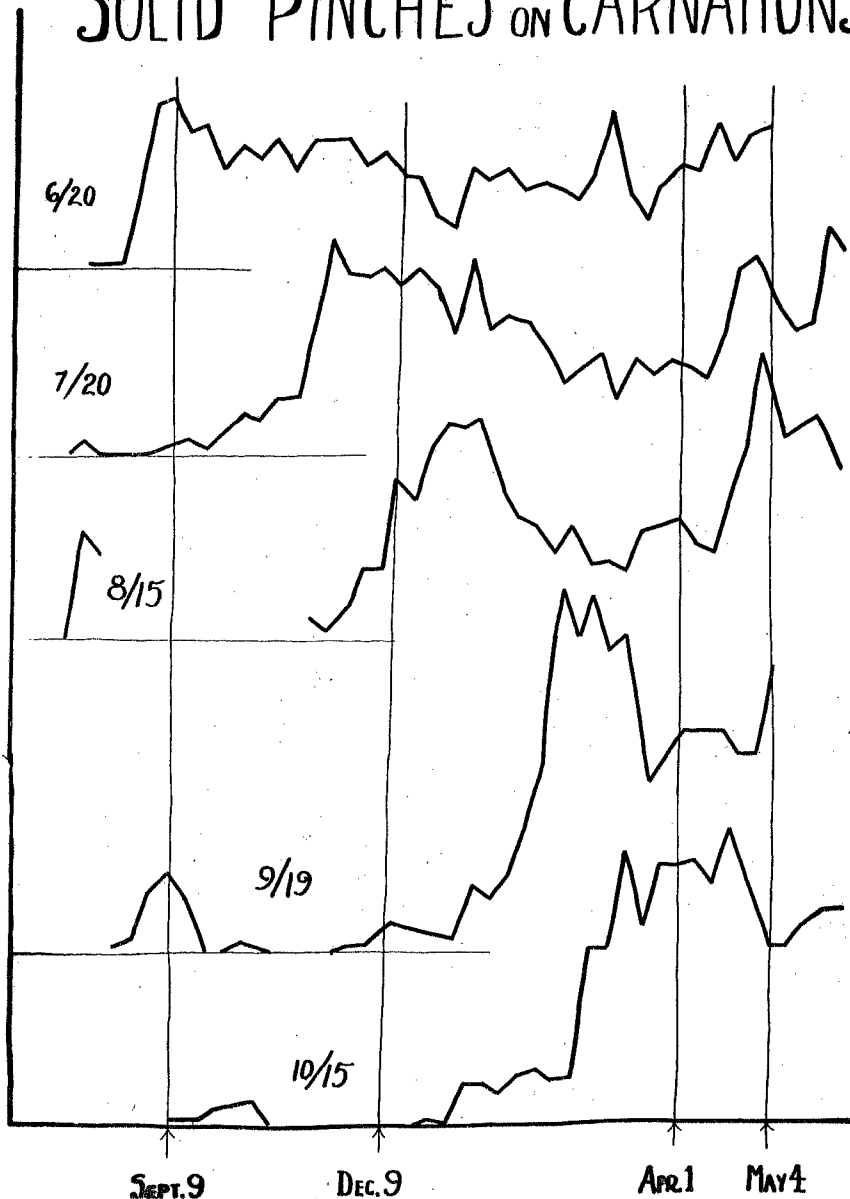


Fig. 1. The distribution of production from five successive solid second pinches on carnation plants at Fort Collins, Colorado, during the summer and fall of 1951.

Table 2. -- The total production and quality of carnations from 4 cropping systems receiving a 2 and 2 second pinch.

Treat. number	Var.	Production		Quality				
		Total	Per ft. <sup>2</sup>	Split	Short	Stand	Fancy	Q.I.
4	RS	1109	31.7	3	37	340	729	4.62
11	WS	1202	34.3	4	5	309	884	4.72
14	RS	1035	29.6	10	14	293	718	4.66
17	WS	1159	33.1	6	19	396	738	4.61

Since treatments 17 and 11 were the same variety (White Sim), the decreased quality of 17 is attributed to later pinching. Breaks resulting from September and October pinches may be weak for they must develop during the shortest days

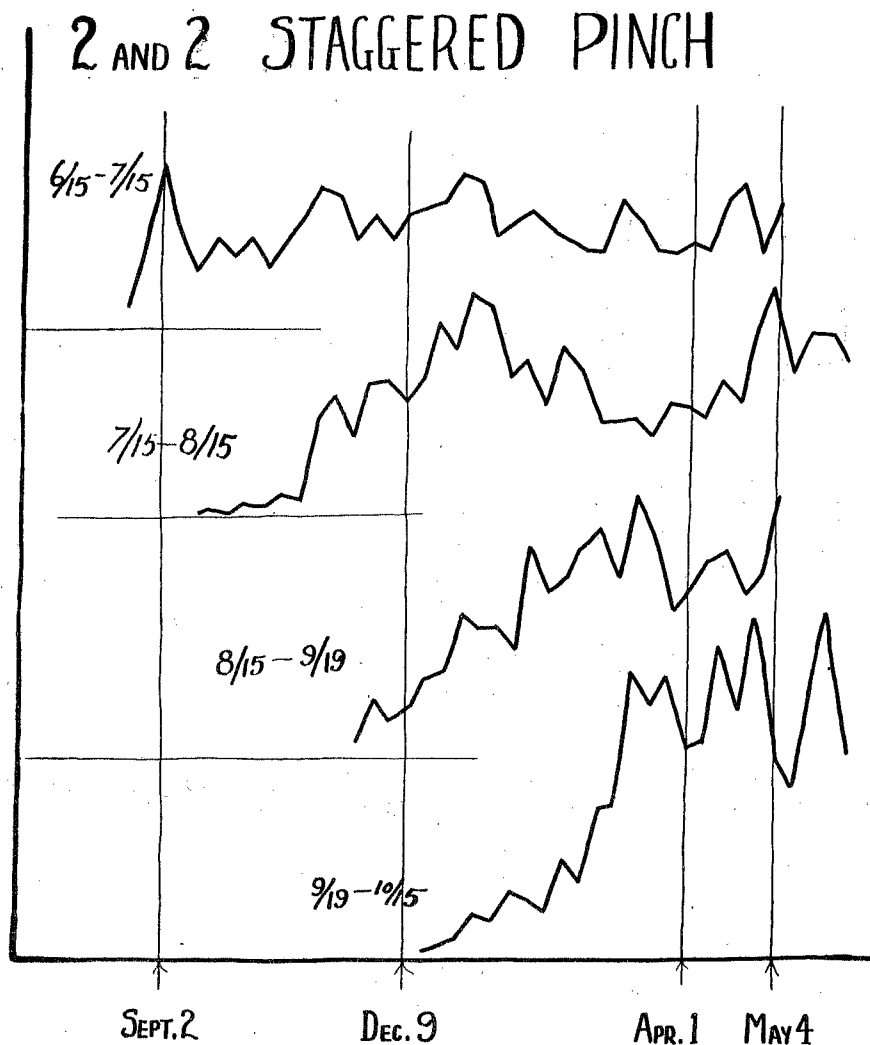


Fig. 2. The distribution of production from four successive 2 and 2 staggered pinches made as second pinches on carnation plants at Fort Collins, Colorado during the summer and fall of 1951

of the year. Treatments 4 and 14 (Red Sim) are nearly the same for both quality and quantity.

Fig. 2. has been prepared to show typical distribution of production from successive staggered pinches. Some similarities between these graphs and those from solid pinches are apparent. Staggered 2 and 2 pinches during the early summer give a steady production with pronounced peaks caused by the pinches. Later pinches tend to bunch the production more and crowd it into shorter periods.

Miscellaneous Staggered Pinches: -- The pinching of one shoot per plant every two weeks was tested in the following cropping systems:

2. Propagated Feb. 10, nursery bed Mar. 10, pinched Apr. 15, benched May 18, second pinch most advanced shoot per plant on June 5, June 20, July 5 (total 3 pinches per plant).

3. Same as 2 except an additional pinch per plant on July 20.

8. Propagated Mar. 15, nursery bed Apr. 15, pinched May 15, benched June 15, second pinch most advanced shoot per plant on July 5, July 20 and Aug. 5 (total 3 pinches per plant).

9. Same as 8 except an additional pinch per plant on Aug. 20.

Little difference in either quality or quantity was noted between these 4 systems (Table 3). This method of pinching produces a potential steady production subject only to the fluctuations of weather.

Table 3. -- The total production and quality of carnations from 4 cropping systems in which a staggered second pinch was used.

Treat. number	Var.	Production		Quality				
		Total	Per ft. <sup>2</sup>	Split	Short	Stand	Fancy	Q.I.
2	RS	1169	33.4	12	81	376	700	4.51
3	WS	1178	33.7	9	28	377	764	4.61
8	WS	1142	32.6	8	11	329	794	4.67
9	WS	1151	32.9	5	9	323	814	4.69

The cropping systems which had 3 shoots pinched per plant instead of 4 began heavy production approximately 2 to 3 weeks earlier. Treatment 2 began heavy production August 19, whereas 3 started similar production Sept. 2. Treatment 8 began heavy production Oct. 21, while treatment 9 did not start producing heavily until Nov. 11. The quality produced by these 4 systems was not different except for treatment 2 and this difference is attributable to variety.

Summary. -- To obtain an even distribution of carnation production desirable in some plantings, the plants must be pinched a second time. The pinching system used will vary with the flowering pattern desired by the producer. The more complete the second pinch, the later the planting will begin flowering.

Second pinching is a means of raising quality because it increases stem length of the first crop and it may be used to distribute the entire crop through the winter and spring months.

A near-solid second pinch in June or July, or a well staggered system of pinching that extends into August and September, should accomplish reasonably even distribution of production.

Caution: -- Pinching systems that cause a heavy crop of flowers to mature in January and February should be avoided. Due to light conditions at this time of year, heavy competition may cause extremely weak stems.

To offset the tendencies of single pinched carnations to go in and out of crop, if this is undesirable, it is suggested that half the shoots resulting from the first pinch be pinched a second time as soon as they are ready. This will be approximately 7 weeks after the first pinch. With such a system, almost steady production can be accomplished.

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Branching of young carnation plants is affected by at least two factors--light and available nitrates. A shortage of either one causes retarded and sparse branching, often causing the new plant to run up to a bud without originating side breaks. Removal of the terminal bud in this case will cause branching but often less branches will be produced than would be if light and nutrients were more nearly optimum. The breaks can be grown on a carnation plant or they can be pinched on. Naturally, the latter are not as heavy or as desirable.

Good light for a nursery bed of young plants cannot be had between producing benches from December 1 to February 15. Benches that are shaded by gutters are also too dark at this time.

The nitrate level of soil for young plants should be low to medium. The lower the level, the more benefit there is to be derived from early feeding, however. Young plants that are set in a soil with low nitrate content should have a half feed as soon as they stop wilting or in 10 days to 2 weeks at the outside. Watering the cuttings in with a nutrient solution is beneficial if the soil nitrates are low. Young plants which have been started at Colorado A & M in a soil deficient in nitrogen have not been able to catch up with plants that were well fed all the way.

Growers who have not had the most desirable branching of direct-benched cuttings should be sure that the young plants do not get hungry the first month they are benched. High nitrates are not necessary at this stage but nitrate hunger is costly.

Your editor,



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