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CARNATION CUTTING METHODS AND TWO-YEAR CULTURE^{1/} by Larry Taylor, Denver Wholesale Florist Co.

It has been said ever so many times in the past that "the man who holds the hose grows the rose". That is as true today as yesteryear, and the saying applies to carnations as well as to roses. However, another saying might be "a carnation's productive life may be determined by the guy who wields the knife". The cutting methods used in the culture of carnations are important and may be one of the very factors that help make up the word we love to hear--"profit".

I was almost thrown for a loop when I was asked to talk on carnation cutting methods and two-year culture. My very first thought was what is there to tell the growers that they haven't learned from experience and don't already know. Then I realized that it isn't what we know, but what we don't know, that makes this a difficult subject to discuss. Therefore, I am going to attempt to remind you of some of the things that may have been forgotten, and at the same time, throw in an idea or two to make us think more about the subject.

There are definitely two ways to cut a carnation plant - a wrong way and a right way. First, I'd like to think of cutting just from a mechanical standpoint.

There are a number of things that may be done that make up the wrong way to cut a carnation plant. At one time or another, it is easy to observe the results of the cutter who has a knife, a pair of hands and no eyes. He very seldom takes the time to sharpen the knife, with the result that the plant may be partially pulled loose in the soil, and major branches of the plant are at one time or another broken away from the stem, causing a mechanical injury and leaving a wound for disease organisms to enter. It has always been a mystery to me how a dull knife can cut so many supporting strings. Of course, it isn't the dull knife as much as the carelessness of the cutter, who fails to reach in at the proper level to make the cut, thus breaking a lot of strings.

Early in the cutting season it can be heart breaking to see so many young breaks cut through when the flowers are cut. When this happens, it has cost at least 10¢ to cut that flower.

Just the other day I was watching one man cut, and every now and then he would pull a flower down through the wires and out. Those flowers were certainly taking a beating. I asked him why he was pulling them down through the wires that way. His answer was that

he was saving the cuttings and didn't want to break them off by catching them on the wires and strings. I guess he was convinced that the egg came before the hen.

The point I am trying to emphasize is that in the hustle and bustle to get through with a chore, lots of permanent damage can be done to a bench of carnations. CUT THE CARNATION AS A PLANT, NOT AS A BENCH. Take just a moment longer to make that cut and it will help maintain the quantity and quality of our carnation production at a higher level. Take the time and effort to teach employees how to cut. It will pay big dividends.

Now to discuss cutting methods from a production view point. Again there is a wrong way and a right way. I don't believe this is the time nor the place for me to say that William Sim should be cut at one height, and some other variety at another height. Therefore, I must stick to generalities.

Any method of cutting Carnations that seriously lowers quantity and quality would be the wrong way. I used the phrase "seriously lowers quantity and quality" for the reason that under some conditions and with some varieties, if we did not cut so as to lower the production, the quality would be very poor. Therefore, in some cases, the right way to cut would be to lower the production. We must maintain production, but we must also maintain quality.

Many times I have been asked, "What is the right way to cut this plant?" There are many right ways to cut a carnation plant. The right way is the way that will make that plant produce the most good marketable carnations that it can, during the time when the market can use them. The right way to cut at one season of the year or under some conditions may be exactly the wrong way at another, and vice versa.

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^{1/} This talk was presented at the Thirteenth Colorado Short Course.

There are many things to keep in mind when cutting a carnation plant. Here are five points which are most important.

1. What are your future plans for the plant? When will it be tossed out?
2. When will the breaks that are on the stem be cut, bloom?
3. What are the future market prospects and demands?
4. The size of the plant.
5. The growing conditions of the plant.

What are your future plans for the plant?--When will it be tossed out? If the plant is to produce only two crops, we, of course, will cut above the good flowering breaks on the first cut. It is at this point the question is asked, "How many breaks should be left?" My answer for now is "only as many as the plant will support". I know that answer is evasive, however, I will attempt a more direct answer later.

If the plant is to be tossed out after the second crop, there is no reason to leave any breaks. It will be best to cut low in an effort to let in more light and air for the later developing shoots of the second crop. By cutting low I mean as low as possible without cutting off a shoot that will bloom before the bench is dumped.

If the crop has been planted early, and a summer, early winter, and a spring crop is planned, then, of course, we must cut to the breaks on the first and second cuts, and to the heel or below on the third cut. The number of breaks left after the first and second cuts will again depend upon how many the plant can support.

If the plant is to be tossed out before the breaks can bloom that might be left, there is no reason for leaving those breaks. We might as well have good stem length.

If a bench is to be carried over a second year, more care must constantly be given to the cutting of the late winter and spring cut. This will be discussed further under two-year culture.

When will the breaks bloom that are left on the stem to be cut?--Experience is the only way to gain this knowledge, and it is very necessary information if the carnation plant is going to be cut in the right way. Being able to know if a break will bloom before a flower holiday or prior to the tossing-out date, determines if the cut is made high or low on the plant. This may be the determining factor if you cut a "fancy" or "standard" stem length. It also determines whether the plant is loaded with a lot of unnecessary breaks that may lower the quality of the remaining blooms to be cut.

What are the future market prospects and demands?--If the man cutting has an idea of what is in the future as far as the market is concerned, and also has the experience to know when a side shoot will bloom under normal growing conditions, he can influence the time of the return crop by cutting to the breaks, or cutting in the hard or soft wood. The use of this information will be most helpful during the late spring and summer months.

The size of the plant:--It has been mentioned before that the number of breaks left after cutting a flowering stem is determined by how many the plant can support. Under normal growing conditions, a plant will usually produce only so many flowers of a good marketable quality. If the plant is overloaded with too many breaks blooming within a short time, the quality of all blooms may be lowered. If too many breaks are forced at one time, the time of their blooming will be delayed, and many of them will never bloom, at least within a reasonable length of time.

The growing conditions:--One growing condition which will influence the method of cutting is the spacing of the plants themselves. Under conditions of close planting each plant will support fewer breaks than a plant with a wider spacing.

We know that to produce peak quality pompoms, each flowering stem must be given at least 24 square inches of soil to grow in. I have never heard a figure quoted for carnations, but I am sure that the production of "fancy" carnations per year per plant will be in direct relation to the number of square inches of soil the plant is given to grow in.

In several older greenhouses in this area, there are a number of benches which do not have sufficient head room to properly cut a tall-growing variety. There is no need to save high breaks on a stem if they will hit the glass before they bloom.

There is also the possibility that the plant should be cut according to its location in the bench. We have all observed that the outside rows in a bench always produce several more carnations than inside rows. I do not have any statistics to show, but it may be possible that the outside row of plants should be cut lower, regardless of the height of the side shoots, and the center rows of plants cut higher so that more light and air can reach the plants in the center of the bench. It could be that this method of cutting would encourage those center rows of plants to throw more and stronger breaks.

We have all seen flowers cut low in the middle of a bench because they do not have side shoots, and "fancy" length carnations are in demand. This results in the stump becoming lost, and often never producing another good flowering break.

TWO-YEAR CULTURE

Now we come to that very controversial subject, two-year culture of carnations. I think of this as controversial because almost every grower has a definite opinion as to its merit. He is usually much in favor of it or much opposed to it. The reason for this is obvious. He has either been successful or unsuccessful in the culture of carry-over crops. There are many things that determine whether he will be successful or not. But, if he has kept the bench free of diseases and insects, and he has properly fed and watered it, then there is only one other thing that determines success or failure of a two-year bench; how it has been cut. Before the subject of cutting carry-over benches is discussed, I would like to discuss two-year culture in general.

Many times I have been asked, "Should I carry over any benches?" There are distinct advantages and disadvantages to carry-over crops. Some of the finest quality I have ever seen has been produced on second-year plants. Two-year-old plants, if they are right, do have a good root system. But of course, there is the opposite condition too. A lot of very poor flowers are produced on carry-over plants. Many carry-over plants will give just as good production as new plants, if not better. But if a poor job of carrying over is done, production can be disappointing.

One of the main disadvantages in two-year culture is that it is much more difficult, with our present knowledge, to control the timing of production. This statement will, of course, not hold true if a bench is cut back on the proper date. At least it can be made to hit the Christmas market. A bench cut through the summer will usually produce at a more or less steady rate with an increase in the spring production.

One of the main advantages to two-year culture is the fact that it does not have to be replanted. It has been estimated that it costs anywhere from 50¢ to \$1.00 a square foot to replant a bench. This figure may seem high, but when everything such as taking and propagating of cuttings, space used for nursing plants that could have been in cut flower production, tossing old plants out, cost of steam sterilizing, planting, rewiring, restringing, and the high cost of labor is taken into consideration, we can see that replanting is expensive. Undoubtedly we could conceivably cut seven to ten flowers less per square foot on a carry-over bench and still make as much money.

We should decide as early as February or March that a bench is to be carried over, if we are to cut the bench properly. There are three main methods of cutting used in carrying plants over.

1. In a low-constructed or ground bench, every cut may be made higher than the previous cut, or cut to breaks. There are several disadvantages to this method. It may give us too much early summer production, which may be poor in quality due to the competition of too many breaks and the hot weather which is normal at this time. More wires and strings are required and plants must be kept staked perfectly, as the breaks have a tendency to lay down and grow very crooked. I think this is the least desirable method of cutting for two-year culture.
2. Another method is to start cutting low on the plants in the spring and early summer. This is usually done when cutting the second crop. During March to May, the weak and crooked stems should be pruned out as the plant is usually carrying plenty of good breaks. Sometimes plants may be carrying too many breaks, therefore, one or two major branches may be trimmed out at this time. An advantage of cutting this way is that, by cutting every stem low as it blooms during the late winter and spring, the plant's production is decreased during June and July when there are usually too many carnations. Other advantages are that production is steady and level, quality should be good, and the bench is not much taller than normal.
3. The third method of cutting is to give the plant a hair cut. That is, cut every branch down to the same level at one time. We could start quite a discussion on this method of carrying over plants as to the proper time to do it, and the proper height to cut. Last year one bench of White Sim at one greenhouse that was cut back on June 16 to about 8 inches above the soil level came in good for Christmas, while at another greenhouse the same variety cut back on the same day at the same height did not begin to produce until January. In view of this, it is almost impossible to pick out a date a bench should be cut back, however, I will say that under normal conditions, it should be done not later than June 10th. I have seen plants cut back as low as 5" and as high as 20" above the soil level. The lower cut bench gave satisfactory production and quality. The high cut bench gave good production, but quality was poor, as it was supporting far too many shoots. Probably the cutting level should be around six to eight inches.

One grower cut back every flower shoot but one per plant. When this flower bloomed, two to four weeks later, the stem was cut at the level of the previous cut. This does make the cutting back of the bench harder, but it does have the advantage of not completely upsetting the foliage and root ratio. The upsetting of the foliage-root relationship is one of the disadvantages of this cutting method. Extreme care must be given to see that the plants are not over-watered or severe losses of plants may occur.

Another disadvantage in this method of cutting is that many breaks are being forced at one time. This probably will lower the quality unless some thinning is done. This condition can be corrected by cutting out the weaker breaks and pruning out major stems so that no more breaks will be left than the plant can support.

One of the advantages is that the plant is out of production in June and the poorer market months, and it can be timed for the Christmas market.

COOLING THE GREENHOUSE

Methods of lowering the temperature in the greenhouse during the summer are important topics of discussion at this time of year. A very simple one which we have seen used, and which is reported to give a material reduction in temperature without serious drafts, is just to knock a number of cement blocks out of the foundation wall at ground level along the sides of the house. This admits cooler air than comes in through the side ventilators and does not create the same drafts on the plants. Of course, the strength of the wall is a limiting factor, but we know of two growers who have used the method effectively where about one quarter of the blocks were removed. Of course, these are replaced in the fall and removed each spring, but they are left out all summer long.

We were interested in the effect of such vents on bombing. The growers in question tell us that they have continued to use bombs during the summer just the same way that they do with the ground level vents closed during the winter, and that the open vents do not seem to affect the results. If such vents are built into a new house the construction can be stronger and more ventilation can be provided.

From Edco News Letter - H. W. Ridgeway, Editor.

CARNATION TIMING FROM A SINGLE PINCH

Enough work has been done at Colorado A & M on growing carnations from single pinches made at various times of the year that we are able to present the following guide. These dates are average for Sim varieties. Some have been interpolated but the majority are from actual records.

| If Pinched | First crop will peak around | Week Required |
|----------------|-----------------------------|---------------|
| Early January | Mid-June | 24 |
| Late January | Late June | 23 |
| Early Feb. | Early July | 22 |
| Late Feb. | Mid-July | 20 |
| Mid-March | Late July | 18 |
| Mid-April | Early August | 16 |
| Mid-May | Late Aug.-Early Sept. | 15 |
| Mid-June | Late Sept.-Early Oct. | 16 |
| July 1 | Early November | 18 |
| Mid-July | Early Dec. | 20 |
| Early August | January | 22 |
| Late August | February | 24 |
| Late Sept. | Late March | 26 |
| October | April | 26 |
| Early November | Early May | 26 |
| Early December | Late May | 25 |

Timing for the "pinch and a half" system of cropping may be estimated from this table. The pinch and a half involves a second pinch of half the breaks which result from the first pinch. If half of the most advanced breaks are pinched as they clear side shoots, the unpinched breaks will lead the crop into production. A pinch and a half delays production over a single pinch approximately 2 weeks on plants which bloom July to September, and 4 weeks on February to April crops.

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F I R S T C L A S S