ROOTING TRIALS WITH CARNATIONS:

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In 1967, Cheever made an extensive study on carnation propagation with the results published in CFGA Bulletins 206, 207 and 208. Essentially, he found that horticultural perlite with peat moss (70-30) plus calcium carbonate at a rate of 2 ounces per cu. ft. gave the best rooting under mist. Seventy degrees in the rooting medium was desirable, with a good cutting weighing 7 to 8 grams before sticking, and with a mist application of 2 cm water per day.

Some recent problems with carnation rooting prompted us to run a series of short trials. The results are shown in Figures 1 through 3. Carnations were rooted in 60-40 peat moss and perlite or perlite alone, with no calcium, calcium sulfate (gypsum) or calcium carbonate ($CaCO^3$). Results clearly confirmed Cheever's conclusions to the effect that $CaCO^3$ must be added to media containing peat moss in order to counteract excess acidity. Rooting was generally good in perlite alone with no calcium added. The use of $CaSO^4$ resulted in poorest rooting (Fig. 1).

Fig. 1. Effect of rooting medium and calcium source on carnation rooting.
Left to right:
40-60 perlite and peat moss, no calcium
40-60 perlite and peat moss, $CaCO^3$ added.
40-60 perlite and peat moss, $CaSO^4$ added.
100% perlite, no calcium.

Another trial involved various rooting hormones applied as dips or sprays (Table 1). According to Cheever, Jiffy-Grow #2 gave the best results in his trials. As noted in Figure 2, Jiffy Grow did perform well, either as a dip or a spray. A prepared liquid hormone solution containing .2% IBA + .125% NAA also gave good results. Poor rooting caused by excessive amounts of rooting hormone could readily be seen when concentrated sprays or dips were used (Fig. 2).

It is possible to stick carnation in the propagation bench too soon after steam sterilization (Fig. 3). In our trials good rooting of carnation cuttings did not result until the

Table 1. Carnation rooting index of various rooting hormones and application methods.
Index: 0 = no roots, 2 = poor, 3 = fair, 4 = good and 5 = excellent roots.

Treatment	Rooting Index
Jiffy Grow (.5% IBA + .5% NAA) base of cuttings sprayed	4.50
Jiffy Grow (.5% IBA + .5% NAA) base of cuttings dipped for 20 seconds	4.00
Liquid rooting hormone (.2% IBA + .125% NAA) base of cuttings sprayed	4.00
Liquid rooting hormone (.2% IBA + .125% NAA) base of cuttings dipped for 20 seconds	3.75
Rooting powder (.1% IBA) base of cuttings dipped in powder	3.25
Control — No hormone	3.00
Concentrated liquid hormone (2% IBA + 1.25% NAA) base of cuttings sprayed	2.50
Concentrated liquid hormone (2% IBA + 1.25% NAA) base of cuttings dipped for 20 seconds	1.20

Fig. 2. Effect of various rooting hormones and application methods on rooting of carnation cuttings.
Left to right:
Control, no hormone
Liquid hormone (.2% IBA + .125 % NAA), 20 sec. dip
Concentrated liquid (2% IBA + 1.25% NAA), 20 sec. dip
Concentrated liquid (2% IBA + 1.25% NAA), spray
Jiffy Grow (.5% IBA + .5% NAA), 20 sec. dip
Liquid hormone (.2% IBA + .125% NAA), spray
Jiffy Grow (.5% IBA + .5% NAA), spray

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temperature of the rooting medium was 90°F or less at the time of sticking. Temperatures higher than this cause permanent damage to the cuttings, resulting in poor rooting. At least five hours were required for the temperature to fall below 90°F in our propagation benches containing perlite and peat moss.

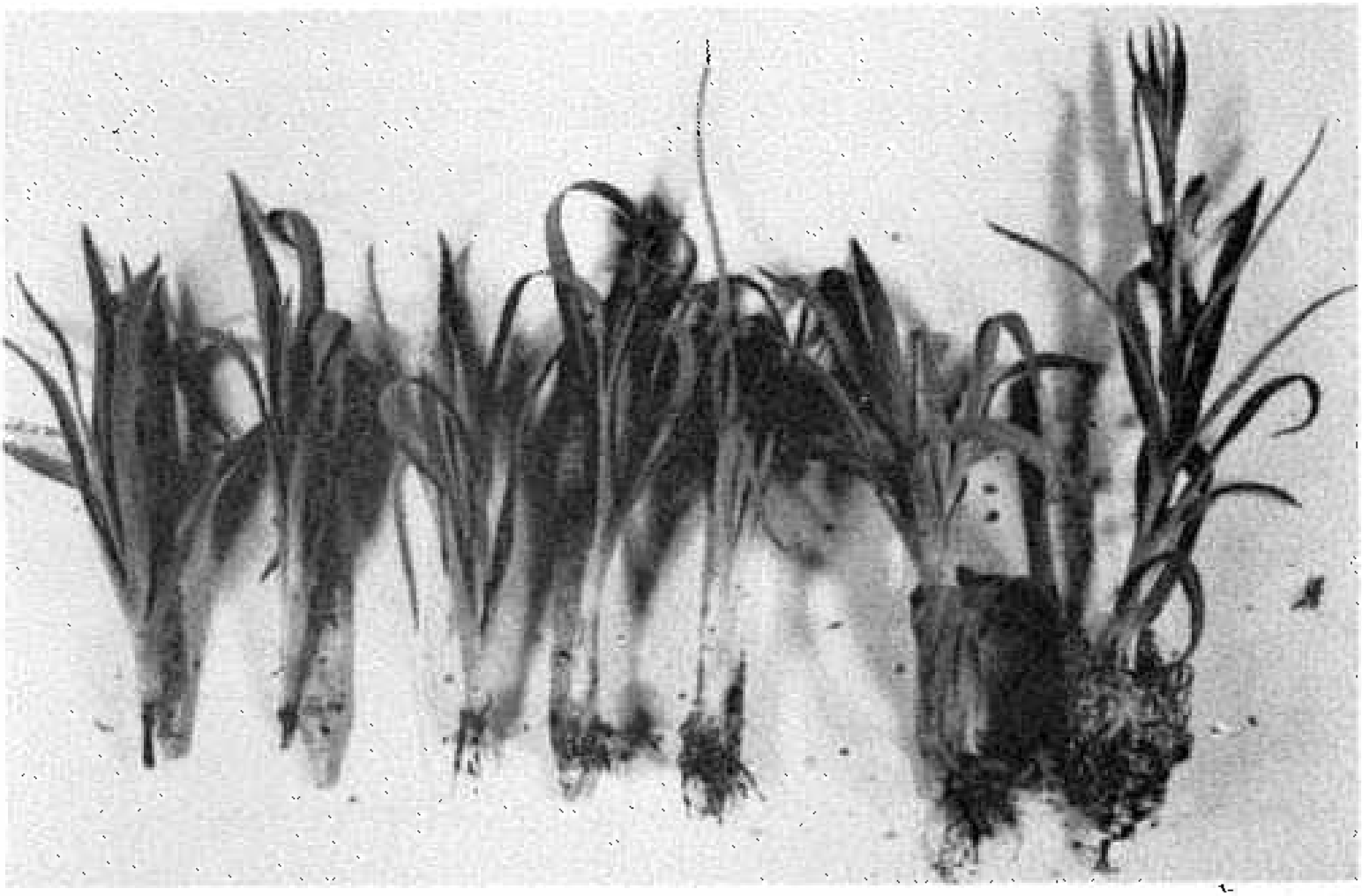

Fig. 3. Effect of excessive heat in rooting media. Carnation cuttings were placed in propagation medium at varying temperatures following steam sterilization.
Left to right:
130°, 120°, 110°, 100°, 96°, 92° and 90° F.