IN COOPERATION WITH COLORADO A & M

Secretary, Ray App, 4434 Colorado Blvd., Denver, Colorado

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College Day to be September 16

Organized tours of the Research Greenhouses on West Lake Street from 10 a.m. to 12 noon. New laboratory and propagation facilities will be of special interest.

Luncheon on your own at the Student Union Cafeteria.

The afternoon session is scheduled in the Student Union. During this session reports will be made by the staff on work completed the past year. Some work in progress may get additional attention at this session. A detailed program will be included in the September Bulletin. Reserve the 16th on your calendar.

Carnation Mother Stock Must Have Ample Nitrogen

by R. E. Odom

Nitrogen nutrition of carnation mother stock affects the number and size of cuttings produced and especially the performance of the plants resulting from these cuttings. Nitrogen deficient stock produce fewer side breaks and are slower to clear these breaks than plants from stock which has had sufficient nitrogen. The effects of potassium and phosphorus on the cuttings or resulting plants are not as striking or as easily measured as the nitrogen effects.

All possible combinations of 3 levels of nitrogen, 2 levels of phosphorus, and 3 levels of potassium were tested on White Sim carnation stock plants. Eighteen plots of 21 plants each were planted Sept. 13, 1952, to study the effects of these nutrients in combination on the production of cuttings and the rooting and growth responses of the resulting plants. Ammonium nitrate applied at the rate of $\frac{1}{2}$ pound per 100 square feet of bench area was used as the source of nitrogen. The nitrogen levels were maintained from normal to deficient by varying the number of applications in a ratio of 3:2:1. Phosphorus levels were maintained at high and normal by incorporation of treble superphosphate, at the rate of 5 pounds per 100 square feet, in the soil of the high plots before planting. Potassium chloride applied at 1 pound per 100 square feet regulated the potassium levels from high to low by varying the number of

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applications in a ratio of 3:2:1.

Cuttings from these nutrient plots on Dec. 19, Jan. 13, and April 1 were rooted to observe rooting response. When removed from the rooting medium, the extent of rooting was arbitrarily divided into 4 catagories (Table 1).

Table 1. Rooting index of cuttings taken from the nutrient plots on December 19, January 13 and April 1.

		Rooting index a/			Rooting index a/			Rooting index a/
	High	3.40		High	3.24		High	3.39
Nitrogen	Medium	3.40	Potassium	Medium	3.32	Phosphorus		
	Low	3.20		Low	3.44		Low	3.28

a/ 1. No rooting
2. Slightly rooted
3. Medium rooted
4. Well rooted

When the cuttings were removed from the rooting medium, only slight differences were observed in rooting. Cuttings from the high nitrogen plots produced a slightly larger root system than those from the medium or low plots. There were no apparent differences due to potassium or phosphorus levels.

Cuttings taken April 1 were rooted and planted in a nursery bed and fed nitrogen by liquid feeding each time they were watered. The first pinch was made when the side breaks were plainly visible. Plants from the high nitrogen plots were ready for the first pinch 4 weeks after transplanting. Plants from the low and medium plots were pinched 1 to 2 weeks later. Some of the plants from the low nitrogen plots had cleared no side breaks after 6 weeks in the nursery bed.

Plants originating from high, medium and low nitrogen plots were separated and benched at normal spacing for further observations of growth and production. When all breaks had elongated, the number of breaks per plant was counted. The average number of breaks per plant was found to be 3.49 for plants from the high nitrogen plots, 3.18 from the medium and 2.87 from low. These were distinct differences.

Additional records were kept on the total number and average weight of cuttings from each nutrient plot. High nitrogen produced more and larger cuttings than either medium or low (Table 2). Potassium or phosphorus levels did not materially affect the number or size of the cuttings.

Table 2. Total number and average weight of cuttings taken from the nutrient plots.

		Total number of cuttings	Average weight per cutting in grams
	High	1836	5.70
Nitrogen	Medium	1374	5.30
	Low	929	4.81
	High	1400	5.07
Potassium	Medium	1360	5.38
	Low	1379	5.37
	High	2110	5.32
Phosphorus			
	Low	2029	5.23

Fig. 1 pictures the typical growth of carnation plants originating from stock plants grown at different levels of nitrogen. Numbers 1, 2, and 3 were from the low, medium and high nitrogen plots. Number 4 is representative of cuttings from stock plants maintained at an even higher nitrogen level than that for number 3. The plants were photographed 47 days after they were removed from the propagating medium, during which time they were all fed adequate nitrogen.

Fig. 1. Carnation transplants propagated from mother stock which was grown (1) nitrogen deficient, (2) at medium, (3) high and (4) still higher soil nitrate levels.