IN COOPERATION WITH COLORADO A & M

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

Bulletin 47 September 1953

College Day - - - September 16

Bring Your Key Help And See Your Research Program In Action

Organized tours of the Research Greenhouses on W. Lake Street from 10 a.m. to noon.
Luncheon at Student Union Cafeteria

Afternoon Session at the Student Union
Topic--CURRENT FLORICULTURAL RESEARCH AT COLORADO A & M

1:00 p.m. - Costs of watering greenhouse crops by George Caparas, Colorado Flower Growers' Research Fellow in Civil Engineering.
1:30 p.m. - The past year's work in review:
Pathological--W.D.Thomas, Jr.
Floricultural--W.D.Holley
3:30 p.m. - Discussion period.

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Rose Grower's Day At College - - October 14

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Potassium, Sodium and Calcium Nutrition of Carnations

by W. D. Holley

Seven pounds of muriate of potash per 100 square feet of bench area applied to carnations from July to January increased production over carnations grown with 3 pounds or with no additional potash. Additions of potash did not affect the grade of flowers cut.

Four applications of gypsum at 5 pounds per 100 square feet of bench from May to February affected neither the yield nor the quality.

Four applications of sodium, applied as livestock salt at one pound per 100 square feet, did not affect production but it significantly increased the grade of flowers.

Studies have been made by various workers on the potassium nutrition of carnations. Recently, Lunt, Sciaroni and Bowles completed a study on fertility control of carnation in California. They applied various amounts of nitrogen, phosphorus and potash to soils in 2 different greenhouse ranges. Their soil tests showed that large amount of both nitrogen and potassium are lost from the soil either by plant absorption or through leaching. They found a distinct increase in production of number 1 carnations when potash was added to a light textured soil mixture. The addition of potash to a heavier soil, which was much higher in potassium content, resulted in no increase in yield.

In This Issue

Rooted cuttings of Wm. Sim carnation were direct-benched on May 23, 1952, in sterilized soil from the Table Mountain area west of Denver, Colorado. "Table Mountain soil" is a sandy loam with low initial nutritive levels, being especially low in calcium, potassium and sodium.

Forty-eight plots were designed with buffer plants of Colorado Gold on the outside rows and between the rows of Wm. Sim. Each plot actually contained 8 plants of Colorado Gold and 4 inside plants of Wm. Sim. Spacing was 7 X 8 inches. The treatments were arranged in a randomized block design and involved 3 levels of potassium, 2 levels of calcium and 2 levels of sodium. These levels were used in all possible combinations and repeated 4 times.

The highest potassium level involved applications of muriate of potash at one pound per 100 square feet of bench area 7 times during the period from July 2 to January 27. Three applications of muriate of potash were made to the medium level during the period and none to the low level. To maintain the high calcium level, one application of gypsum at 5 lbs. per 100 sq. ft. was made before planting and 3 subsequent applications at the same rate were made up to February 24. No calcium was added to the low level. A coarse grade of livestock salt was used to supply additional sodium. This was added at 1 lb. per 100 sq. ft. 4 different times to one set of plots while another set received no additional sodium.

Production from a single pinch began in September. Flowers were separated into splits and the short, standard and fancy grades by a combination of weight plus length. Plants were taken out of production May 9, 1953.

As a means of comparing all grades of flowers produced by each treatment, a quality index (Q. I.) was set up. This index, which we use frequently, is calculated by multiplying the number of splits X 2, shorts X 3, standards X 4, and fancies X 5. The total of these divided by the number of flowers cut in each treatment gives the quality index for that treatment. A difference of 0.10 in Q. I. is usually statistically significant, meaning that chance alone could not have produced the difference.

Potassium,

The high level of potassium produced 882 blooms, an average of 13.8 per plant. This was significantly greater than the 762 flowers produced when no potash was added. Three pounds of potash, the medium level, produced an intermediate yield of 827 blooms. It should be noted that the initial potassium content of the virgin soil supplied a part of the requirements of the carnations. The second year such a soil is in use might well result in a more distinct reduction in yield from only 3 lbs. of potash per 100 sq. ft. The differences in quality shown in Table 1 are not significant.

Table 1. The effect of 3 levels of potassium on production/a and quality of Wm. Sim carnations.

	Split	Short	Stand.	Fancy	Total	Q. I./b
High	40	148	322	372	882	4.16
Med.	13	142	332	340	827	4.21
Low	32	160	233	337	762	4.15

/a Production in each level is from 64 plants

/b Minimum significant difference with odds of 19 to 1-- 70

Calcium

High calcium produced 1247 flowers, an average of 13.0 per plant versus a production of 1224 or 12.75 per plant for low calcium. This difference is not significant. The grade of flowers was almost identical for the two levels of calcium (Table 2)

Table 2. The effect of 2 levels of calcium on production/a and quality of Wm. Sim carnations.

	Split	Short	Stand.	Fancy	Total	Q. I.
High	47	225	462	513	1247	4.16
Low	38	215	425	536	1224	4.17

/a Production in each level from 96 plants.

Sodium

High sodium produced 12.74 blooms per plant, whereas no additional sodium produced 13.0 flowers. This difference is not significant. However, the quality of flowers cut was significantly better when sodium was added. Additional sodium produced fewer splits, fewer shorts and more standards, raising the quality index even though the number of fancies was the same for both treatments.

Table 3. The effect of 2 levels of sodium on production /a and quality of Wm. Sim carnations.

	Split	Short	Stand.	Fancy	Total	Q.I./b
High	30	204	462	527	1223	4.22
Low	55	236	425	522	1248	4.11

/a Production in each level for 96 plants.
/b Minimum difference to be significant with odds of 19 to 1--0.09

Although livestock salt was used as a source of sodium in this experiment, it is not the intent to recommend salting carnations. Two or three applications of sodium nitrate during the year should adequately supply the sodium requirements of carnations.