

Potash--

The Controversial Nutrient

by W. D. Holley

From 1952 to 1954 William Sim carnations were grown at Colorado State University in replicated plots of virgin sandy loam soil which received three application rates of potash. The lowest rate (designed to be inade-

quate) was one pound of muriate of potash per 100 square feet per year. The medium rate was 4 lbs. and the highest rate was 8 lbs. The dry applications of potash were spaced evenly over each yearly period.

Table 1. The effects of 3 levels of potash on yield and grade of William Sim carnations.

Potash level	Split & Short	Standard	Fancy	Total	Mean Grade
High	80*	707	538	1325*	4.32
Medium	41	627	631*	1229*	4.44*
Low	49	609	405	1063	4.33

* Indicates statistical significance.

Effects of these potash levels on the second year's yield and grade may be seen in table 1, which is reprinted from CFGA Bulletin 60. Plants receiving the medium rate of potash produced the most fancy flowers and the highest average grade. During the spring of the second year, the low potash level significantly reduced cut flower life. It should be pointed out that while the high rate of application produced as many flowers, the average grade was lower than for the medium application rate.

With the wide adoption of constant liquid feeding, more accurate information is needed on the effects of potash treatment rates for irrigation water.

Rooted cuttings of White Sim carnation were planted in 10-inch pots of volcanic scoria on November 20, 1957. There were 3 plants per pot, 3 pots per treatment. Four potash rates were applied as the treatments.

All nutrient solutions contained the following chemicals per 1000 gallons of water: calcium nitrate 7.7 lbs; magnesium sulfate, 2.2 lbs.; and 52% phosphoric acid, 2.0 lbs. In addition, adequate trace elements were supplied. The four potash rates were obtained by adding the following amounts of potassium chloride per 1000 gallons:

1/4 Normal --- 0.61 lbs.
 1/2 Normal --- 1.22 lbs.
 Normal --- 2.44 lbs.
 2 Normal --- 4.88 lbs.

The solutions were applied as "slop culture" daily, 1/2 gallon per three pots. The plants were grown in an air conditioned greenhouse. The length of stem in inches and the weight of flower and stem in grams were recorded for all flowers. The cutting period extended from May 10, 1958 to May 20, 1959.

Results and Discussion

The differences between treatments shown in table 2 are small when one realizes that there is a difference of 8X between 1/4 Normal and 2 Normal potash. Yield was reduced by the two lower rates, but weight per inch of stem and percentage of dry matter were not affected. The weight per inch of stem has been found to

Table 3. Effects of potash on flower conformation.

Potash level	Percentage of hollow flowers	Percentage of flowers with too many petals
1/4 Normal	5.2	1.5
1/2 Normal	4.1	3.6
Normal	10.8	4.8
2 Normal	14.2	7.9

Table 2. Effects of widely differing levels of potash on yield and weight of White Sim carnation flowers.

Potash level	Yield	Mean length in inches	Mean weight in grams	Weight per inch of stem
1/4 normal	194	24.8	25.4	1.02
1/2 normal	196	25.6	26.3	1.03
Normal	231	24.6	25.6	1.04
2 normal	240	24.1	23.9	0.99
Minimum dif.	11	---	---	not significant at 5% level

be an excellent measure of stem strength. At no time were there visible differences in stem strength between treatments.

Petalage and flower form were affected by potash levels (table 3). As potash increased, both hollow flowers and those with too many petals (bullheads, splits and slab-sided flowers) increased. This is not fully understood since the two types of malformation are opposite in character. The results in table 3 should be taken merely as an indication until this can be confirmed or refuted on larger numbers of plants.

Potash hunger signs were distinctly visible on the 1/4 Normal treatment, and to a lesser extent on the 1/2 Normal treatment. These signs consisted solely of premature ripening of older foliage and some "firing" of the lower foliage on current growth.

This author has never seen potash hunger on carnations in commercial greenhouses. These results indicate to us that we could experience some potash hunger without reducing yield or quality materially.

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Your editor,
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