Carnations Are Not Sensitive to Different Soil Phosphorus Levels

by W. D. Holley

Pink Sim carnations growing in a soil low in phosphorus (1-2 ppm) produced as many flowers with the same average quality as those growing in soils high or very high in phosphorus. There were no differences in the keeping of the cut flowers produced at these three phosphorus levels.

A 35-foot bench was divided into nine plots by means of double boards so that three phosphorus levels could be replicated three times at random. In preparing the soil before planting, no phosphorus was added to one set of plots, while 5 and 12½ pounds of treble superphosphate (36%) per 100 square feet were added to the high and very high phosphate plots respectively. No additional phosphate was applied during the season. The phosphorus levels at the end of the season, when tested by the Arnold and Durtz method and read with a photelometer, were 1-2 ppm for low, 8-16 ppm for high and 26-38 ppm for very high. The latter test is obtained quite frequently in Colorado greenhouse soils, especially when complete fertilizers have been used freely.

Rooted cuttings of Pink Sim were benched May 13, 1954 and grown with a pinch and a half. The production was reasonably steady from late September to early May, when the records were terminated. Table 1 shows the production, grade and quality index (weighted mean quality) from the three phosphorus treatments. The differences between treatments were almost non existent.

Table 1. The effects of three levels of soil phosphorus on the yield and grade of Pink Sim Carnations.

Phosphorus level	Split and Short	Standard	Fancy	Total	Quality index
Low	27	221	491	739	4.60
High	24	193	516	733	4.64
Very high	22	198	498	718	4.64

Discussion

We have been investigating the influence of the major soil nutrients on carnation growth for several years. Nitrogen, potassium, and to a lesser degree sodium have marked effects on carnation growth and yield. However, we have not found them to influence the keeping quality of the flowers unless they were almost completely deficient.

Phosphorus, on the other hand, seems to affect neither yield, grade, nor keeping quality, at least in the broad range investigated here. Carnation plants deficient in phosphorus are extremely stunted and thin, with color more or less normal. Extreme phosphorus hunger would cause low yield and low quality. With present methods of soil testing, phosphorus should never be a problem.

Continuing to apply phosphorus when the soil is loaded with this nutrient is costly and unnecessary. This investigation and previous ones with gravel culture show clearly that a phosphorus test of 2-5 ppm (either Spurway or Arnold and Durtz) at planting time is adequate for carnations for at least the following year. We have maintained this level with 2½ pounds of treble superphosphate per 100 square feet per year.

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