Carnation Studies

A. C. Bunt reported on several growth and development experiments with carnation. Examination of data from the sequential planting of rooted carnation cuttings at 14-day intervals throughout the year has shown the importance of light intensity in carnation culture. Rates of growth and development were determined from plants grown under full natural light intensities and also from plants grown under plastic netting which reduced the light intensity by 50 percent.

Growth rates, defined as the increase in plant dry weight per day of paired cuttings grown for 27 days, showed a linear response with increasing solar radiation integrals. Under full light intensity the growth rates ranged from approximately 0.01 gram per day with a mean solar radiation of 30 cal/cm^2/day to approximately 0.11 g per day with a mean radiation of 300 cal/cm^2/day. Plants grown at half the normal light intensity showed a corresponding decrease in growth rates.

From these data there is no evidence of the carnation reaching light saturation under glasshouse conditions (in Southern England) within this range of 30 to 300 cal/cm^2/day. The maximum mean relative growth rate of the carnation, reported the previous year as 4.66 percent per day, is low by comparison with that of pot-grown chrysanthemums, where values of approximately 10 percent per day for rooted cuttings over a 27-day period in summer have been obtained.

DEVELOPMENT - Other carnation cuttings were "stopped" (pinched) at 6 leaf pairs 21 days after planting and were grown to anthesis under full or half light conditions. Plants grown under the reduced light intensity showed a delay in anthesis ranging from approximately 7 days for the plantings made in early March to a maximum of 80 days for a planting made in mid-July. The stem strength of flowers cut throughout the year from all plants grown under normal and reduced light intensity was measured objectively and has been examined in relation to solar radiation. Stem strength was found to be an exponen-

tial function of the mean daily level of radiation intensity over the period of planting to anthesis, the function being of the form $Y = Ke^{-ax}$, where Y is a measure of stem strength, x the mean daily radiation integral, and K and a are constants. This relationship of stem strength with radiation was also examined for several growth stages, and the correlation coefficient was found to increase as the period prior to anthesis was reduced. This suggests that stem strength was most influenced by solar radiation in the latter stages of flower development.

ROW POSITION - In another experiment the yield of flowers from plants in each longitudinal row in the bed was recorded over a 2-year-period for 2 plant densities, namely, 20 and 60 square inches per plant. During the 2 years after planting the total yield of each outside row, i.e., the row adjacent the walk, was approximately 4 times that of the center rows when the spacing was 5X4 inches, and twice that of the center rows when the spacing was 10X6 inches. Although the differences in yield due to row position were evident 6 months after planting, the most significant effect occurred during the second year when the plant canopy was more developed. These differences in yield may be related to the different amounts of light being received by the various rows. This is being made a part of a separate study and will be reprinted in a CFGA Bulletin at a later date.

Ed. Note: These experiments were completed in an area where light energy is considerably less than in Colorado. They show the importance of light in carnation culture and further emphasize the importance of clear days. Bunt concludes that shading of glasshouses is detrimental for carnations and that the only possible use for shading would be in a case where temperature cannot be kept down by ventilation and cooling.