The effect of soil modification nutrition and some growth regulators on the flower quality and concrete oil yield of carnation

Mohamed El-Sayed Ibrahim Mohamed

The Effect of Soil Modification, Nutrition and Some Growth Regulators on the Flower Quality and Concrete Oil Yield of Carnation'The experiments included in this study were carried out at the Experimental Farm of the Faculty of Agriculture Science at Moshtohor, Zagazig University durinc three rAlccessive sealons 1978/1979, 1979/1980 and 1980/1981. Carnations, cv. Enfant de Nice were grown in 5 media viz. (Ma) clay soil, (Mb) clay + 3 volumes sand, (!dc) clay + 3 volumes peat moss, (111d) clay + 3 volumes sand + 3 volumes beat moss +1 volume lime, and (Ma) clay + 3 volumes peat uoss + 3 volumes sand + 1 volume lime + 2 kgs. dry blood. In another experiment, carnation plants were fertilized with both nitrogen and potassium elements added on one month intervals.Also the effect of the growth regulator cycocel and gibberellic acrd on carnation was investigated. In each experi-ment the following character was taken into consideration.Concerning the disbudded plants, number of out flowers per plant, diameter of cut flowers, fresh weight of cut flowers per plant, flower stem length as well as fresh weight of flower stems were estroated.Concerning the plants grown without disbudding the fresh weight of flowers/plant, the percentage of each N, P and K in leaves and stems were taken into consideration. The percentages of concrete oil and cut flowers were estimated.A comparative chemical study was carried out with regards to the concrete percent in flowers of three different cvs. of carnations Enfant de Nice, Chabud and Goldsmith. The oil of Enfant de Nice was subjected for G.L.C. analysis.I. Effect of soil modification :Application of peat moss raised significantly the number of flowers per individual plant. A soil medium consisting of clay and sand gave a better quality of cut flowers (size) in comparison with other media applied. Application of lime with clay, sand and peat moss provoked the fresh weight of the individual flower.Addition of dry blood to the soil medium consisting of clay, sand, peat moss and lime resultod in total fresh weight of flowers per individual plant in comparison with other media used in the experiment.Soil medium consisted of clay plus sand was more favourable for nutrients absorption compared with other soil media. Addition of dry blood to the soil medium led to a maximum con-centration of nitrogen and phosphorus in plant tissue. II.Effect of different fertilization levels : There tas a partial positive correlatica between N and fertilizatior, number and size of disbudded flowers per plant, higher level of fertilization increased significantly the total flowers per plant as well as length and weight of individual flower stem.The total fresh weight of cut flowers per plant attained its maximum value due to application of higher level of N and K fertilization.Addition of increment amounts of fertilization gave no response concerning the N and K percent in both leaves and stems. However, N accumulation was more obviously observed in leaves rather than ip stems, due to higher fertilization level.Percentage of carnation flower concrete provoked due to application of a proper level of fertilization. Further addition of fertilizerE was not in favour of concrete synthesis.III.Effect of growth regulator :Plants sprayed with 2000 ppm cycocel gave maximum number and weight of flower per individual plant compared with the higher concentration of this growth regulator (3000 ppm). Also lower concentration raised the flower quality (flower size). In contrast, 2000 ppm cycocel resulted in a significant decrease in disbudded flower stem lengthIn general, cycocel reduced the weight of flower stems.Application of cycocel increased

the total fresh weight of out flowers per plant.Application of 3000 ppm cycocel gave a positive marked influence on N percent in both leaves and stems. whereas 2000 ppm cycocel increased the K percent with 6.7% over that of un-treated plants. In general, cycocel decreased the phosphorusuptake over the entire growth cycle.The percentage of carnation concrete attained its maximum value due to application of higher concentration of cycocel. The increase percent reached 63.32% and 17.89% over that of control plants in both successive seasons respectively.Number of disbudded flowers per plant decreased due to application of 100 ppm gibberellic acid. In contrast, the flower size and flower stem weight, flower stem length and total weight of disbudded flower per plant increased with gibberellicacid.In general, gibberellic acid gave a fluctuated influence on the total weight of flowers per individual plant over the two successive growing seasons. Plants sprayed with gibberellic acid contained lower concrete percentage in flowers, compared with the untreated plants.Both nitrogen and phosphorus uptake decreased with applica-tion of gibberellic acid. On the other hand, GA3 stimulated the potassium uptake.GA3 resulted in a significant decrease in the percentage of carnation oncrete.- Effect of fertilization combined with growth regulator spraying on the cut flower charak,teristicsThe plants treated witi_ 100 Ipm GA3 plu4 2000 ppm CCC in combination Ihith considerable level of fertilization gave better results concerning total number of cut flower.; per plant.Application of either 2000 ppm cycocel or 100 ppm GA3 raised the diameter of disbudded flowers.Plants sprayed with both GA3 and CCC pr,)duced higher fresh weight of cut flowers in comparison with plants treated with GA3 or CCC indiviively.Plants treated with cycocel produced short flower stem, in contrast, application of GA3 raised the flower stem length. Also, the combination of both growth regulators increased the length of stea.Application of cycocel at 3000 ppm resuted in general dec-rease in weigit of flower stem. But addition of the same con-centration of this hormone with lowest level ,f fertilization im:reased significantly the weight of flower ’7tem. GA3 in general increAsed the weight of flower stem.Applica;ion of cycocel increased the to-;a1 fresh weight of flowers per ildividual plant, but further concentration of the hormone decreased this character. Plant treated with GA3 produced higher yield of flowers, while plants sprayed with both CCC and GA3 produced more flowers.The average nitrogen percent reached its maximum value in F1CCC2 treatment. On the other hand, application of GA3 with increased amounts of fertilization increased the average nitrogen percent, this effect seemed to be as reflection of further addition of nitrogen, than to be owed to GA3. The average nitrogen percent in both leaves and stems increased due to application of GA3 in combination with cycocel in comparison to application of each of GA3 and cycocel individ-ually. Application of cycocel at concentration 2000 ppm with increment levels of fertilization gave a negative responsewith regards to the average phosphorus percent. On the contrary, application of gibberellic acid at concentration up 100 ppm in combination of increment addition of fertilizer gave a positive response with regards to phosphorus percent. Plants sprayedwith gibberellic acid and cycocel attained maximum value of phos-phorus percent in shoots as an average of the whole growing season in comparison with plants treated with cycocel or gibbere-llic acid individually. On the other hand, application of various levels of fertilization in combination with GA3 + OCCi gave incurrent effect on phosphorus percent in plant shoots over the entire growth cycle. Application of higher concentration of cycocel up 3000 ppm decreased the average percentage of potassium but addition of the forementioned level of this growth regulator in combination of F1 level of fertilization raised the potassiu. uptake. App:ication of cycocel in combination with gibberellic acid DROPped the average percentage of potassium in both leaves and stems in comparison with the tendency of either cycocel or gibberellic acid individually. Thus, this decreased percent amounted to 25, 32.3 than that of GA3 and CCC1 treatment, res-pectively. Addition of combined growth regulator with increment of both N, P elements resulted in a slight incurrent effect on potassium percent in both leaves and stems over the entire growthcycle. High concentration of cycocel up 3000 ppm was favourable for concrete formation compared with lower concentration of this hormone in ccabination with considerable leve of fertilization. 100 ppm GA3 treatment gave lower percentage o.2 concrete compared wi ;h differen’; concentrations of cycocel at the same level of fe;tilization. In general, at F1 and F2 leve-s the application of both GA3 and CCC provoked the percentage of the carnation con-crete over that of treatment consisted of GA3 or CCC individually.- Gas chromaL’igraphy analysis of the volatile oil of carnatio., flowers :The concrete yield

of 0.48% of carnation cv. Chabud is relatively higher in comparison to CV3. Enfant de Nice (0;30) and Goldsmith carnation (0.3(It is clear that the carnation oil cv. Enfant de Nice contains the following alcohols i.e. elemol, eugenol, iso-eugenol and -thugol. The corresponding intensities were6.5, 6.3, 5.1 and 4.8% respectively. Concerning the identified hydrocarbons, it is clear that the total hydrocarbons mono-terpenes represent 33.369%. The identified sesquiterpene HC were calamenene (8.7%) and -cadinene (5.1%).