

SUMMARY AND CONCLUSIONS

The study was conducted through seasons, 1984/1985, 1985/1986, and 1986/1987 on Rosa gallica var. aegyptiaca plants of 18 months age.

The investigation was performed in the experimental farm of the Faculty of Agriculture, Zagazig University, at Moshtoher.

The present investigation includes three parts; the effect of growth regulators, kinetin (in the concentration of 50 and 100 ppm) and B (in 2000 and 4000 ppm), the effect of nitrogen fertilization at the levels of 150, 300 and 450 kg/Feddan as ammonium nitrate, and the interaction between growth substances and nitrogen fertilization. The effect of these factors were studied to investigate their effects on growth and flower characters anatomical changes of buds and some chemical analysis.

The results obtained could be summarized in the following :

- I. Vegetative Growth :
 - a. Kinetin :

Kinetin increased plant height by 50 and 76% over the control in the two concentrations used. This increase was 100 and 179% in number of canes/plant. In fresh weight of canes the percentage increases due to the two levels of kinetin were 106 and 190%. While with fresh weight of leaves kinetin produced 32 and 50% increase over the control.

Dry matter percentages of canes and leaves were increased by the first level of kinetin only.

- b. B

B influenced all the growth characters studied, in which the first level was the most effective. This differ than the trend

obtained by kinetin which produced its effect with increasing the concentration. B is a growth retardant and exhibited a stimulant effect with the lower concentration only.

II. Nitrogen Fertilization

Nitrogen was applied in three doses 150, 300 and 450 kg ammonium nitrate/Feddan. Nitrogen increased plant height by adding different nitrogen levels. The increases due to the 3 nitrogen levels were 34.83, 31.12 and 42.91 over the control respectively.

The canes number corresponding to each level of nitrogen was 22.66, 35.33, 39.66 and 44.00 per plant for 0, 150, 300, and 450 kg ammonium nitrate. With respect to the fresh weight of canes, it was found that the second level of nitrogen had the most promising and highly significant effect. Gradual increase in dry matter percentages of canes were found due to the addition of nitrogen.

Fresh weight of leaves per plant increased as nitrogen levels increased. The values were 30.46, 35.71, 37.76 and 41.55 grams for N_0 , N_1 , N_2 and N_3 respectively. On the other hand the percentage increases of dry matter of leaves over the control were 8.04, 7.49 and 19.04 due to the three nitrogen levels.

3. Interaction Between Growth Regulators and Nitrogen Fertilization

a. With the Combination of kinetin and nitrogen the higher values could be pointed out as follows :

Plant height : The optimum treatment was higher kinetin combined with the first level of nitrogen.

Number of canes : The higher values was with treatment took

higher kinetin with medium nitrogen level.

Fresh weight of canes/plant : The optimum treatment was higher kinetin with lower nitrogen dose.

Dry matter percentage of canes : The higher values were obtained by both higher levels of kinetin and nitrogen. Fresh and dry weight of leaves, the higher values were obtained by K₁ N₃ and K₂ N₁ respectively.

b. With combination of B₉ and nitrogen the following treatments were the optimum for producing higher values for each aspect studied :

Plant height : B₉ N₁ , Number of canes : no interaction occurred, Fresh weight of canes/plant : no interaction, Dry matter % of canes : B₉ in its two doses combined with nitrogen with the medium level, fresh and dry weight of leaves : no interaction occurred.

II. Flowering :

1. Growth Regulators

a. Kinetin

a.1. Flowering period started from March and continue to May in which maximum production was obtained in all the treatments conducted. Kinetin increased the monthly and flower yield/plant compared with control. The yield was 25.20, 55.0 and 118.05 grams in March, April and May respectively by the first level, however the second one gave smaller values. The total flower yield per plant was influenced by kinetin treatment. The yield was 198.25 and 144.15 for K₁ and K₂ versus 71.23 grams for control in 1986, while were 189.35, 139.13 versus 73.36 in 1987.

a.2. Kinetin influenced bud development by increasing rate of development and differentiation.

b. B₉

b.1. B₉ in its two doses influenced flower yield, monthly or total yield per plant in the two growth seasons. The yield/plant was 119.24 and 158.24 for B₉¹ and B₉² versus 71.23 grams for control in 1986, while were 99.18 154.16 versus 73.36 in 1987.

b.2. B₉ affect bud development, in picture opposite to that with kinetin. The cells were minute in shape and size and very narrow in its diameter, oil gland is clear, leaf perimordia is delayed and less in length.

II. Nitrogen Fertilization

1. Nitrogen in the second level (300 Kg) increased flower yield as monthly or as total per plant in the two seasons. The yield was 188.61, and 181.26 for seasons 1986, and 1987 respectively versus 71.23 and 73.36 grams for control in the two seasons.

2. Bud development was not influenced by nitrogen fertilization as detected by the anatomical studies.

3.a.1. As the interaction between kinetin and nitrogen their effect on flower yield per plant was considered a synergism effect was occurred between the first dose of kinetin and the third level of nitrogen which produced the higher yield.

3.a.2. No changes in tissues of transverse section were observed as influenced by combination of nitrogen and kinetin.

3.b.1. B₉ the higher values of flowers per plant, and consequently per feddan were obtained with the treatment of higher doses of B₉ and nitrogen.

3.b.2. No anatomical changes could be observed in the

combination between B₉ and nitrogen.

III. Chemical Analysis

1. Growth Regulators

a. Kinetin

1. Concrete percentage increased by applying kinetin with its two levels. However, with the concrete yield per plant or per feddan, the first level gave the highest yield and the first season always gave the higher yield.

2. With regard to plant pigment chlorophylls increased by kinatin application but the low concentration was most effective. The values obtained were 4.21, 4.12 for K₁ and k₂ effective. On the other hand, carotenoids increased linearly with kinetin concentration from 0.74 to 1.14, to 1.18 for k₀, k₁ and k₂ respectively.

3. With respect to carbohydrates, no effect of kinetin was observed.

4. Nitrogen percentage in leaves was highly influenced by kinetin treatments, but the low dose of kinetin was the superior which gave 1.88% versus 0.73 and 1.53 for control and k₂.

b. B₉

1. Concrete percentage and concrete yield increased by B₉ with its two doses. The higher yield of concrete was obtained at 4000 ppm concentration, since it produced the higher yield of flower with high percent of concrete.

2. B₉ treatments increased chlorophyll "a", "b" and their ratio. Chlorophyll "a" increased from 4.53 to 5.28 with B₉₁ and B₉₂ Carotenoids also were raised with the two levels of B₉, to reach 1.18, and 1.77 respectively.

3. With regard to the total carbohydrates, the first dose of B₉ stimulated the carbohydrate content in the leaves of rose plant, the value was 5.13, however, the second level inhibited the carbohydrate content, since so it is less than the control, it gave 2.50 mg/gm while with the control it was 3.16.

4. Nitrogen percentage in leaves was remarkably influenced by B₉ application, the low dose promote the nitrogen percentage in plant leaves, it was 1.74%.

2. Nitrogen Fertilization

1. Nitrogen in its three levels applied create an increase on concrete percentage, but when dealing with concrete yield per

plant or feddan, the picture differed. The second dose of nitrogen produced the higher yield of concrete. The yield per plant due to this level was 0.647 and 0.633 gm for the first and second seasons respectively.

2. Plant pigments, including chlorophylls and carotenoids increased also by nitrogen doses added. For chlorophyll the percentages increase over control were 14.92, 69.40 and 164.92% for N1, N2 and N3. However with carotenoids, the second dose of nitrogen was the most effective.

3. When dealing with carbohydrates, it was obvious that nitrogen till 300 kg stimulated total carbohydrate, the value obtained with that level was 4.79 versus 3.60 and 3.80 for N₁ and N₃.

4. Nitrogen percentage in the leaves generally increased by the different nitrogen doses applied.

3. The Interaction Between kinetin, B₉ and Nitrogen Fertilization.

In general, no constant trend could be postulated from the interaction between kinetin and nitrogen on one hand and B₉ and nitrogen in the other hand. The three factors studied, i.e. kinetin, B₉ and Nitrogen gave the higher values when used lonely. However synergetic effects occurred between different combination.

4. Chemical Composition of Absolute Oil

Gas liquid chromatographic analysis revealed 26 compounds from which 8 compounds were identified. The major compound was phenyl ethyl alcohol which comprised about 31% of oil. All the compounds exerted in the oil resembles that of all rose oil types. The following compounds were identified :

Phenyl ethyl alcohol, citronellol, nerol, geraniol, B-caryophyllene, eugenol methyl ether, sesquiterpene and sesquiterpene alcohol.