Summary And Conclusion

5. SUMMARY AND CONCLUSION

This work was carried out to study the effect of gamma radiation, gibberellic acid and ascorbic acid on seed germination, growth and flowering of *Delphinium ajacis* and *Mathiola incana* plants.

In this respect, three field experiments were conducted under the conditions of newly reclaimed sandy soil at Inshas (Sharkia) during the two successive seasons of 1998/1999 and 1999/2000.

First experiment:

Delphinium and mathiola seeds were irradiated before sowing with gamma rays at 0, 25, 50, 75 and 100 gray to study the effect of gamma irradiation on seed germination, plant growth and flowering, seed yield/plant, leaf chlorophyll content, soluble sugar content and nutritional status of plants.

The important results could be summarized as follows:

Delphinium ajacis

1-Irradiated delphinium seeds before sowing with low doses of gamma rays "25-75 gray" significantly increased seed germination percentage and rate. The maximum increase was achieved at 25 gray of gamma rays.

2-Irradiated delphinium seeds with gamma ray doses at 25-75 gray significantly increased leaves fresh weight per plant, vegetative growth fresh and dry weights and root fresh weight, vase life of cut flowers and significantly increased soluble sugars, P and K contents in the plants with a peak at 25 gray.

3-Irradiated delphinium seeds with gamma ray doses at 25 and 50 gray significantly increased plant height, leaves dry weight per plant. Also, the treatments significantly advanced flowering (where the period from sowing till flowering was significantly decreased) and significantly increased flowering portion length per inflorescence, florets number and weight per inflorescence, and increased total chlorophyll content in leaves of the plants with a peak at 25 gray.

4-Gamma rays dose only at 25 gray significantly increased branches number/plant, stem diameter, root dry weight of delphinium plants. Also, the treatment significantly increased inflorescence number/plant, inflorescence length, flowering portion weight per inflorescence and seed yield per plant and per fedden and significantly increased nitrogen content in the plants.

5- Irradiated delphinium seeds with high gamma dose (100 gray) significantly decreased seed germination percentage, plant height, leaves fresh and dry weights per plant, vegetative growth fresh weight, inflorescence length, flowering portion length per inflorescence, seed yield per plant and per fedden and significantly decreased soluble

sugars and nitrogen content in the plants.

Mathiola incana

1-Irradiated seeds of mathiola plants before sowing with low doses of gamma rays "25-75 gray" significantly increased seed germination percentage and rate. The maximum increased was achieved at 25 gray of gamma rays.

2-Irradiated mathiola seeds with gamma rays doses at 25-75 gray significantly increased plant height, vegetative growth dry weight, root dry weight and the treatments advanced flowering where the period from sowing till flowering significantly decreased. Also, the treatments significantly increased total chlorophyll content in leaves, soluble sugars and K contents in the vegetative growth of the plants with a peak at 25 gray.

3-Irradiated mathiola seeds with gamma rays doses at 25 and 50 gray significantly increased leaves fresh and dry weights per plant, vegetative growth fresh weight, root fresh weight, inflorescence length, flowering portion weight per inflorescence, florets number and weight per inflorescence, seed yield per plant and per fedden and also, increased N % content in the vegetative growth of the plants significantly with a peak at 25 gray.

4-Gamma ray dose of 25 gray significantly increased branches number/plant, inflorescence number/plant, flowering portion length per inflorescence, vase life of

cut flowers and P content in the plants.

5- Irradiated mathiola seeds with high gamma dose (100 gray) significantly decreased seed germination percentage, plant height, stem diameter, leaves dry weight per plant, vegetative growth fresh weight, inflorescence length and soluble sugars and K contents.

Second experiment:

Delphinium and mathiola seeds were soaked before sowing in GA_3 solutions at 0, 50, 100, 150 and 200 ppm to study its effects on seed germination, plant growth and flowering, seed yield/plant, leaf chlorophyll content, soluble sugars content and nutritional status of plants.

The important results could be summarized as follows:

Delphinium ajacis

1-Soaking seeds of delphinium plants in GA_3 solutions at 50-200 ppm significantly increased seed germination percentage with a peak at the concentration of 100 ppm GA_3.

2-Concentrations of used GA_3 at 50-200 ppm significantly increased plant height, branches number/plant, leaves fresh and dry weights, vegetative growth fresh weight, root fresh weight, flowering portion length, florets number/inflorescence and florets weight/inflorescence and seed yield per plant and per fedden with a peak at 100 ppm

with a peak at 100 ppm.

3-Concentrations of used GA_3 at 100-200 ppm significantly increased vegetative growth dry weight, root dry weight and N and K contents (%) in the vegetative growth of the plants where the most effective treatment was 100 ppm..

4-Treating delphinium plants with GA_3 at 100 and 150 ppm significantly increased flowering portion weight, vase life of cut flowers and significantly increased soluble sugars content in the plant.

5-Treating delphinium plants with GA_3 at 100 ppm significantly decreased stem diameter and advanced flowering of the plants where the period from sowing till flowering was significantly decreased and significantly increased inflorescence number/plant and inflorescence length.

6-Total leaf chlorophyll in the leaves of the plants was increased as a result of GA_3 treatment at 50 ppm. Whereas the concentrations of 100, 150 and 200 ppm decreased it

7-GA_3 application slightly affected P content (%) in the vegetative growth of the plant. However, treatments of 100 and 150 ppm GA_3 increased P content whereas, the concentration of 200 ppm had a significant decrease in P content.

Mathiola incana

1-Soaking seeds of mathiola plants in GA_3 solutions at 50-200 ppm significantly increased seed germination percentage with a peak at the concentration of 100 ppm

GA_3.

2- Concentrations of used GA_3 at 50-200 ppm significantly increased leaves dry weight and vegetative growth fresh and dry weights and soluble sugars, N and K contents in the vegetative growth of the plants with a peak at the concentration of 200 ppm.

3-Concentrations of used GA_3 at 100-200 ppm significantly increased plant height, branches number/plant, leaves fresh weight, inflorescence number/plant and inflorescence length, flowering portion length and weight, florets number and weight per inflorescence, vase life of cut flowers and seed yield per plant and per fedden with a peak at 200 ppm GA_3.

4-Flowering of mathiola plant was advanced and the period from sowing till flowering was significantly decreased by the concentrations of 150 and 200 ppm GA_3.

5-Treating mathiola plants with GA_3 at 200 ppm significantly decreased stem diameter and significantly increased root fresh and dry weights.

6-Total leaf chlorophyll in the leaves of the plants was increased as a result of GA_3 treatment at 50 ppm whereas, the concentrations of 100, 150 and 200 ppm decreased it.

7-treating of mathiola plants with GA_3 at 150 and 200 ppm significantly increased P content (%) whereas, the concentrations of 50 and 100 ppm GA_3 had a significant decrease in P content.

from sowing till flowering significantly decreased). Also, the inflorescence length, vase life of cut flowers were significantly increased by the same treatments.

5-Treating mathiola plants with ascorbic acid at 100 ppm significantly increased vegetative growth dry weight, root fresh and dry weights, seed yield per plant and per fedden, P content %.

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As a conclusion for *Delphinium ajacis* it was clear that low gamma rays doses at 25, 50 and 75 gray were stimulative for most of the measured parameters of the plant. And the dose of 25 gray was the best. On the other hand, the dose of 100 gray decreased most of the measured parameters.

With respect to gibberellic acid, treatments of 50-200 ppm were stimulative for most of growth and flowering parameters of delphinium plant where the treatment of 100 ppm GA_3 was the best.

With ascorbic acid application, it was found that treatments of 50, 100 and 150 ppm were significant in increasing plant growth and flowering as well as other parameters of delphinium . The best treatment was 100 ppm for the two plants.

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As a conclusion for *Mathiola incana* it was clear that low gamma irradiation doses of seed at 25 and 50 gray were stimulative for most of the measured parameters and the dose of 25 gray was the best.

With respect to gibberellic acid treatments of 100, 150

and 200 ppm were stimulative for most of growth and flowering parameters where the treatment of 200 ppm GA_3 was the best.

With ascorbic acid application, it was found that treatments of 50, 100 and 150 ppm were significant in increasing plant growth and flowering as well as other parameters of mathiola plants. The best treatment was 100 ppm.

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As a recommendation under the similar conditions of this study, the flowing points could be taken into account:-

1-Gamma rays irradiation of *Delphinium ajacis* and *Mathiola incana* seeds at 25 gray is the best for good production.

2-Soaking seeds of *Delphinium ajacis* plant in GA_3 solution at 100 ppm and *Mathiola incana* plant in 200 ppm are the best treatments for good production.

3-Soaking seeds of *Delphinium ajacis* and *Mathiola incana* in ascorbic acid solution at 100 ppm is the best treatment for good production.