



Baghdad University

Effect of Growth Regulators, Brassinolide, CPPU
and Magnetic Field Intensity on Growth and
Flowering of Two Cultivars of Snapdragon Plant,
Antirrhinum majus L.

A DISSERTATION SUBMITTED BY

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Abstract

Two experiments were carried out in the Garden of Horticulture Department / College of Agriculture / University of Baghdad, from 01/10/2009 to 15/10/2010. Two cultivars of snapdragon plants (Rocket Mix.) and (Snapshot Mix.), an experiment for each cultivar, were studied.

The experiments were designed according to the Nested-Factorial Experiments design to study the effect of spraying Brassinolide (BL) at (0, 0.025, 0.05, and 0.1 mg/l) and N-(2-chloro-4-pyridyl)-N-phenylurea (CPPU) at (0, 4 and 8 mg/l) and irrigating plants with regular or magnetized water at different field intensities (500, 1000 and 1500 gauss). Each experiment consisted of four isolated plots. Each plot was irrigated by water at different magnetic field intensities, the plot consisted of three replications, in each replicate 12 rows of plants were distributed

randomly by spraying plant growth regulators treatments, the row consisted of 4 plants represented a pilot unit. Data were analyzed according to the statistical program GenStat, means of experiments results were compared by using the least significant difference test L.S.D. at 5% level. The results can be summarized as follows:

1. Foliar spray of Brassinolide improved most vegetative and flowering characteristics of snapdragon plants (Rocket Mix.). BL at 0.05 mg/l (BL2) significantly increased number of leaves, number of branches, leaf area, chlorophyll content, dry weight of vegetative growth, total carotenoids, content of IAA, GA₃, Zeatin and reduced content of ABA in leaves, in addition to increased number of inflorescences, length and diameter of inflorescence, number of florets/inflorescence, length and diameter of floral stem, dry weight of inflorescence, while foliar spray of Brassinolide at 0.025 mg/l (BL1) gave the highest content of total carbohydrates and total phenols in leaves. Foliar spray of snapdragon plants (Snapshot Mix.) at 0.05 mg/l of Brassinolide significantly increased plant height, number of leaves, number of branches, diameter of main stem, leaf area, dry weight of vegetative growth, total carbohydrates and Ca⁺⁺ content in leaves, in addition to increased number of inflorescences, length and diameter of inflorescence, number of florets/inflorescence and dry weight of inflorescence. While treatment of Brassinolide at 0.025 mg/l elevated chlorophyll and Mg⁺⁺ content in leaves.
2. Foliar spray of CPPU positively influenced all vegetative and flowering characteristics of snapdragon plants (Rocket Mix.) with the exception of inflorescence diameter and flowering time. A significant increase was obtained when foliar spray at 8 mg/l (CP2) in plant height, number of leaves, number of branches, leaf area, chlorophyll content, dry weight of vegetative growth, total carbohydrates, total

carotenoids, total phenols, content of IAA, GA₃, Zeatin and reduced content of ABA in leaves, in addition to increased number of inflorescences, length of inflorescence, duration of flowering, number of florets/inflorescence, length and diameter of floral stem, dry weight of inflorescence and vase life. Foliar spray of snapdragon plants (Snapshot Mix.) at 8 mg/l of CPPU significantly increased plant height, number of leaves, number of branches, main stem diameter, leaf area, chlorophyll content, dry weight of vegetative growth, total carbohydrates, Ca⁺⁺ and Mg⁺⁺ content in leaves, in addition to increased number of inflorescence, length and diameter of inflorescence, early flowering, prolonged duration of flowering, number of florets/inflorescence, and dry weight of inflorescence.

3. Irrigating plants with magnetized water improved most vegetative and flowering characteristics of snapdragon plants (Rocket Mix.) Irrigated plants with magnetized water at 500 gauss (MW1) significantly increased plant height, number of leaves, number of branches, leaf area, chlorophyll content, dry weight of vegetative growth, total carbohydrates, total carotenoids, total phenols, content of IAA, GA₃, Zeatin and reduced content of ABA in leaves. Moreover irrigated plants with magnetized water at 500 gauss significantly enhanced number of inflorescence, length of inflorescence, duration of flowering, number of florets/inflorescence, flowering date, length of floral stem, dry weight of inflorescence and vase life, while irrigated plants with magnetized water at 1500 gauss (MW3) gave the highest diameter of floral stem and diameter of inflorescence. Irrigating of snapdragon plants (Snapshot Mix.) with magnetized water markedly improved vegetative and flowering characteristics. Irrigating with 500 gauss significantly increased plant height number of leaves, number of branches, leaf area, chlorophyll content, dry weight of vegetative

growth, total carbohydrates, Ca^{++} and Mg^{++} content in leaves. It's also increased number of inflorescence, length and diameter of inflorescence, prolonged duration of flowering, number of florets/inflorescence and dry weight of inflorescence.

4. Bilateral interactions between the study factors showed significant effect in improving most vegetative and flowering characteristics of snapdragon plants (Rocket Mix.) and (Snapshot Mix.).
5. Interaction between Brassinolide, CPPU concentrations and magnetized water enhanced some of the characteristics studied of snapdragon plants (Rocket Mix.). Treatment of $\text{BL2} \times \text{CP2} \times \text{MW1}$ led to increase dry weight of vegetative growth, total carbohydrates, total carotenoids, total phenols, content of GA_3 , Zeatin, and increased length of floral stem and vase life. Treatment of $\text{BL1} \times \text{CP2} \times \text{MW1}$ increased content of IAA in leaves, while treatment of $\text{BL2} \times \text{CP2} \times \text{MW2}$ caused a significant decrease in content of ABA in leaves. Treatment of $\text{BL2} \times \text{CP2} \times \text{MW3}$ increased diameter of inflorescence. Interaction between the studied factors significantly improved some vegetative growth characteristics of snapdragon plants (Snapshot Mix.) only, while flowering characteristics were not affected. Treatment of $\text{BL2} \times \text{CP2} \times \text{MW1}$ significantly increased leaf area, dry weight of vegetative growth and total carbohydrates content in leaves. Treatment of $\text{BL2} \times \text{CP2} \times \text{MW0}$ significantly increased number of leaves and number of branches, while $\text{BL1} \times \text{CP2} \times \text{MW1}$ treatment significantly increased Ca^{++} and Mg^{++} content in leaves.