

تأثير القرط والتسميد بالنيحاس في نمو
وأزهار نبات حنك السبع
Antirrhinum majus L.

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Antirrhinum majus L.

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Abstract.

This study was conducted in the lath house belong to the Department of Horticulture, College of Agriculture-Basrah University, during the winter season of 2001-2002.

The aim was to study the effect of pinching and copper fertilization on growth and flowering of snapdragons (*Antirrhinum majus* L.)

Three types of pinching treatment were used (no pinching, single pinching and double pinching) and copper was applied as hydrated copper sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) in three levels (0, 2.5 and 5.0 mg Cu/Kg.)

Results presented that the main effect of pinching was significant in all vegetative and flowering indicators that studied except copper content in leaves, whereas , the main effect of copper application was significant in plant height, number of shoots and leaves, leaf area, chlorophyll content and copper content in leaves. It also resulted in a significant increase in number of flowers per spike, fresh weight of flower and percentage of flower dry matter. The interaction between the two studied parameters led to a significant increase in plant height, copper content in leaves and number of flower per spike only .

Antirrhinum majus Snapdragon ()

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Larson (1980)

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- 1- Ando, T.; K. Fujita; T. Mae ;H. Matsumoto ; S. Mori and J. Sekiya . (1997).** Plant nutrition for sustainable food production and environment. Pp.983 .
- 2- Fischer, - P.and Forchthammer, L.(1989).** Copper fertilization of gerbera. Hort. Abst Deutscher-Gartenbau. 1987, 41 :11, 674-678.
- 3- IFA . (2000) .** Fertilizers and their use. Published by Fao and Ifa (Fourth edition) .Rome Pp. 70.
- 4- Inaba,-Z.; Wakasawa, -H. and Ohtsuka, - H. (1997) .** The effect of pinch treatment on the flowering response in snapdragons (*Antirrhinum majus* L.). Bulletin – of – the -Shizuoka- Agricultural Experiment – Station (Japan) . (Dec 1997) . (no.42) P. 51-65 .
- 5- Jackson, M.L. (1958) .** Soil chemical analysis. Prentic – hall. Inc. Englewood, Cliffs . N.J. 558 .
- 6- Larson, R.A.(1980).** Introduction to Floriculture by Academic press Inc. London.
- 7- Reuther, W. and Labanauskasi, C.K.(1966).** Copper. p. 157-179. In : H.C. Chapman: Diagnostic criteria for plants. Univ. of California, Agric. Pub. Berkley, USA.
- 8- Wainwright, H and Irwin, HL . (1987) .** The effects of paclobutrazol and pinching on antirrhinum flowering pot plants. J. Horti. Sci. 62: (3) : 401-404; 13 ref PY: 1987 .