

Effect of Vitamin B6 and Cobaltous on Groth and flowring of *Callistephus chinenses*

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Summary

This study was conducted during the growing season 2017–2018 to investigate the effect of vitamin B6 and Cobaltous on regetative growth and flowering of Aster *Callistephus chinensis* .The study consisted of 7 treatments with three replicates .Vitamin B6 at concentrations of 10,20,30,ml g/1 as soil drench .While the cobaltous was used at concentrations of 10,20,30 m/1 as foliar spray .And control treatment .Results showed significant increase in plant heigh in all compaired to control treatment . and on significant difference after between treatment .The highest plant height was fond six weeks from treatment which were 14.225 cm treatments. The interaction between treatments and period was significant which where treatment by pyridoxine at 20mg/1 caused highest plant resulted from control treatment after two weeks of treatment after two weeks of treatment which was(7.00cm) .Pyridoxine at 20mg/1 caused highest dry weight for vegetative growth and increased flower diameters and early flowering .treatment by pyridoxine at 10mg/1 caused highest fresh weight ,root fresh weight ,flowers numbers and flower fresh weight .Cobaltous treatment at 30 mg/1 caused highest flower dry weight ,early flowering and lowest flowers number .

Introduction

Chinese aster (star flowers) *Callistephus chanensis* is a winter flowering annual herbaceous plant, gives flowers in late spring and early summer, its radial flower is applied large size similar to a star and prefers sunny places and good drainage lands It can be planted directly in permanent basins if used to identify basins Flowers when landscaping (Tawajen, 1987)

The family Asteraceae and the genus *Aster* spp includes many varieties and species of flowers that are used in horticulture. The most important of them for florists is Monte csino *Aericoides* and the other type is the Chinese aster *Callistephus chinsis* (China Aster) bears shipping, grading and packages (Micchael S. Reid .2009). The ester plant is easy to grow, there are two types of it, annual and perennial, the annual reaches a height of 90–30 cm, and the muammar reaches a height of 150 cm in some varieties. And the colors of the flowers differ according to the cultivars, including white, red, and blue, and all the flowers of the aster cultivars contain a yellow center for the flower. Muhammad Amin and others (2009).

As for the Chinese aster cultivar, the plant is topped with a large-headed flower, native to northern China in areas close to Korea, as well as in North America (John C.Semple, 2009)

Plants that need to be exposed to a long day to bloom can delay or early their flowering by shortening or prolonging the length of the day and thus prolonging their life cycle, if the farmer is able to control the growing season, whether it is

longer or shorter than a year. An example of this is the ability of an American farmer to produce flowers Throughout the year, some types of Chinese aster (Shushan, 1969).

Since vitamins play an important role in stimulating the vegetative growth of plants and thus increasing the efficiency of the photosynthesis process (Abdul Hamid et al., 1993). Seerebryakova and Kalanova, (1978) indicated that there was a significant increase in the number of flowers when they treated rose bush plants with thymine or riboflavin. Also (Al-Taher, 2014) showed the superiority of the treatment of vitamin B6 pyridoxine at the concentration of 20 mg / liter in the height of the plant and the length of the flower stand compared to the rest of the treatments on tulip bulbs. The microelements are also of great importance in plant nutrition, as Al-Atrakji (2008) indicated that plants need to be fertilized with the major elements NPK in large quantities, so they need other elements such as CO, Cl, Cu, Zn, and Fe, but in small quantities.

The current study was conducted with the aim of knowing the effect of vitamin B6 (pyridoxine) and cobalt on the flowers of Chinese ester plants grown under the conditions of Basra Governorate.

Materials and working methods

The study was conducted at the Agricultural Research Station of the College of Agriculture – University of Basra during the season 2017–2018 on the Chinese aster plant *Callistephus chanensis*. The seeds of the plant were sown on 20/11/2017 and after the seeds germinate and the seedlings reach a height of 7–5 cm and the formation of two pairs of true leaves on the seedlings It was separated and transferred to pottery anvils with a diameter of 15 cm, filled with an agricultural medium consisting of 2 parts of mixed soil and one part of peat moss, at the rate of one plant per anvil on 12/1/2018. Aqueous solutions of vitamin B6 pyridoxine were prepared at a concentration of 30, 20, 10 mg. L⁻¹ and cobalt in concentrations of 30,20,10 mg.l⁻¹ and compared to distilled water only.

Plants were treated with vitamin B6 and cobalt on 1/3/2018. The treatments were added as a solution to the growth medium at a rate of 100 milliliters per anvil. In all treatments, the plants were fertilized with NPK complex fertilizer (15–15–15) at a rate of 1 g. Plant⁻¹ (Poultry, 1978) until the end of the study.

The following measurements were taken, the height of the plant in centimeters, the number of flowers on the plant and the diameter of the flower, the number of days it took for the plant to open the first flower on the plant, the fresh and dry weight of each of the flowers, the vegetative group and the root total in grams. A randomized complete block design was used to implement this study and the results were analyzed The least significant difference was extracted at the 0.05% probability level (Al-Rawi and Khalaf Allah, 1980.)

Results and discussion

- 1vegetative growth

-1-1plant height (cm(

The results are shown in Table (1) for the effect of concentrations, where all treatments gave a significant difference in plant height compared to the control treatment, and there was no significant difference between the treatments in plant height. As for the effect of weeks, the plant height was higher after six weeks of treatment, where the plant height reached (14.625), which differed significantly from plants after two weeks of treatment, and plant height did not differ significantly after four weeks of treatment. As for the interaction between the treatments and the time period, it gave the treatment of Vitamin B6 (20) mg. L-1, which amounted to (17,800) cm, and the treatment of cobalt (30) mg. L-1, which amounted to (16.133) cm, which do not differ significantly between them, as it was recorded higher The height of the plant after (6 weeks), while the lowest height of the plant resulted from the control treatment after two weeks of treatment, which reached (7.00) cm. This is consistent with the findings of (Nahed and Balbaa, 2007) when using microelements (zinc) 40 ppm, which led to plant height and the number of main branches of each fresh plant compared to untreated plants. This is what (Mostafa, 1996) found. The treatment of Polianthes tuberosa linn. CV. Doubles with different concentrations of corn, as well as soaking the corms for 24 hours or spraying on the leaves led to an increase in the height of the plant and a decrease in dry weight. Makakaryk (1997) also

observed when fertilizing two-year-old cypress seedlings with Green ziti fertilizer containing major and minor elements (Co,Ni,Mo,Cu,Zn,B,Mn,Fe), which was used as a spray on the shoot every three weeks. It led to a clear increase in plant height, number of branches, wet and dry weight of both shoots and roots, and it agrees with Amin et al. (2009)

Table (1) The effect of cobalt and vitamin B6 pyridoxine and the time period and (the interaction between them on the height of Chinese ester plant (cm

معدل التراكيز الكلية	بعد ست اسابيع	بعد اربعة اسابيع	بعد اسبوعين	الاسابيع / المعاملات
8.033	8.00	8.00	7.00	المقارنة
12.433	14.033	12.133	11.133	10 VB6
14.822	17.800	11.166	15.00	20 VB6
14.644	16.133	15.200	12.600	30 VB6
13.433	14.333	13.900	12.066	10 Cobalt
11.744	15.100	13.033	1.100	20 Cobalt
12.744	16.133	13.766	10.866	30 Cobalt
12.814	14.695	13.314	10.866	معدل الاسابيع (الفترة)

The results in Table (2) show the superiority of the vitamin B6 pyridoxine 10 mg / liter treatment in the fresh weight of the shoot over the rest of the treatments, which amounted to 5.005 g, and the comparison treatment as well. The reason may be due to the role of the B vitamins in increasing the root system and its branches, which in turn is reflected in an increase in the absorption of nutrients

and an increase in the products of photosynthesis, and then an increase in the accumulation of carbohydrates necessary for vegetative growth of the plant has a clear effect on the increase of all vegetative characteristics and then increase the wet weight of the vegetative group as a whole (Robnson1973). These results are in agreement with the findings of Sereyakova (1973) and Kalanova (1978) Serebrya kova on shrub rose plants.

Plants treated with cobalt at a concentration of 20 mm/L led to a significant increase in the average dry weight of the shoot compared with the rest of the treatments. Dry, as well as to an increase in the transfer of the products of photosynthesis processes in the leaves to the developing tops, as well as the transfer of nitrogenous compounds such as amino acids from old leaves to young leaves, by providing the energy needed for this when sugar is oxidized through the entry of vitamin B6 as an enzymatic accompaniment within the enzymes of the respiratory chain to release large quantities From Energy 1978, Routh and .these results agreed with Al-Taher, (2014) on the tulip plant

.The fresh weight of the root total 4-1

Table (2) shows the superiority of the B6 treatment at a concentration of 10 mg/L in the fresh weight of the rootstock compared with the rest of the treatments, as well as the treatment with cobalt at a concentration of 30 mg/L also gave a significant advantage. As indicated by Bathia, Singh (1971) in her study on *Chicorium jntybus*. L. chicory. One of the members of the compound family, to the necessity of the availability of the elements of Mn, Mg, Co, and Ni in the

plant, as they have a regulatory role in the activity of the enzyme ructosyl.transerase found in the roots, which is directly related to the construction of glucofructosans, as its effectiveness increased when the microelements were .available, and it also agreed With Abdul Sahib (2012) on carnations .(dry weight of the root system (g 5-1

Results and discussion

It is evident from Table (3) that the number of flowers of Chinese aster plants increased significantly in the treatment of vitamin B6 at a concentration of 10 mg / liter, as it reached 4.333 flowers / plant. The results also showed that the treatment of cobalt 20 mg / liter was superior to the number of flowers as well, as it reached 3.6667 flowers / plant with a large flower head of the type of katmar as a result of the increase in the number of petals in it. This result is consistent with the findings of Al-Atrakji and Hala (2008), as fertilization with microelements had a significant effect in increasing the inflorescences/plant. While the number of flowers decreased significantly when using cobalt at a concentration of 30 mg / liter, reaching 2,333 flowers / plant, and the production reached the lowest among the control plants, reaching 2,600 flowers / plant. Increasing vegetative and root growth, which helped to absorb the largest amount of water and nutrients, as well as its role in the production of amino and nuclear acids, which is positively reflected on the manufacture of carbohydrates and their transfer from leaves to branches and then creating a state of balance and increasing their

flowers (Florent, 1986). These results agreed with (Al-Samarrai, 2006) on rose .bush plants

Treatment of plants with vitamin B6 pyridoxine at a concentration of 20 and 30 mg / l led the plants to reach the flowering stage early, compared with all treatments that differed significantly with it and did not differ significantly between them except for the treatment of vitamin B6 20 mg / l, which differed significantly with all treatments. Flowering of plants treated with cobalt (Table 3) compared with the rest of the treatments except the comparison and that the delay in flowering may be caused by an increase in vegetative growth at the expense of flowering growth. This result is consistent with the findings of Al-Aqrtaji and Hala (2008) when treating plants with microelements on the dahlia plant, which led to an increase in the number of days required for the plant to reach the flowering stage. In all cases, dahlia plants need mineral fertilizing as it improves the characteristics of vegetative and flowering growth and the formation of tuberous flower diameter 3-2

It is noticed from the results of Table (3) that there were significant differences between the studied treatments in their effect on the average flower diameter of the Chinese aster plants, as the flowers of plants treated with vitamin B6 at a concentration of 20 mg / liter were significantly superior to the increase in diameter compared to the flowers of the rest of the treatments and this is in agreement with (Abdul Hamid et al. (1993), treatment with vitamins leads to an improvement in the quality of the flowers produced by increasing the diameter of

their petals. It was also noted from the same table a significant superiority of plants treated with cobalt at a concentration of 20 mg / liter and this is consistent with (Hala and Al-Atrakji, 2008). Significant among treatments except with neglect of comparison and treatment with vitamin B6 20 mg / liter, and the reason for the increase in flower diameter of Chinese aster plants may be due to the quality of this variety, as a large flower rises above the stem of the main . (plant, its diameter in ideal conditions reaches 12 cm (John C.semple, 2009

fresh weight of the flower 4-2

It is evident from Table (3) that the concentration of 10 mg / liter of vitamin B6 gave the highest rate of 3,2666 in the fresh weight of the flower compared to the rest of the treatments, but this increase did not reach the significant level among .the treatments

flower dry weight 5-2

Table (3) shows that the treatment of 30 mg / liter with cobalt gave the highest average dry weight of flowers, which differed significantly with the comparison treatment, while the rest of the treatments there are no significant differences .between them

Table (3) The effect of vitamin B6, pyridoxine and cobalt on the flowering .characteristics of the Chinese aster plant *Callastephus chinensis*

تركيز المعاملة ملغم	عدد الازهار / نبات	عدد الأيام لظهور اول زهرة	قطر الزهرة (سم)	الوزن الطري للزهرة (غم)	الوزن الجاف للزهرة (يوم)
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			(يوم)		لتر /
3133	1,5133	1, 7200	35, 000	2,000	المقارنة
0,4500	3,2667	4,3333	24,333	4,333	10
0,8500	5,5000	17,666	2,667	2,6667	20
0,6633	1,9000	4,7333	18,333	3,000	30
0,4767	1,933	3,8333	24,333	2,3333	10
0,4000	1,7000	4,8333	24.000	3,667	20
0,9433	1,6667	4,4333	22,333	2,9048	30
0,5998	2,680	0,6272	5,2795	1,229	أقل فرق معنوي 5%

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