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Impact of Seaweed Extract, Chelated Manganese and Some Chemical Substances on Growth Parameters and Yield Components of Cauliflower (*Brassica oleracea* var, botrytis)

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Abstract

The study was conducted to investigate the influence of seaweed extract, chelated manganese, and two other chemical substances that are known as Agro promotor1(substance No.48) and Agro promotor2 (substance No.50) on the growth, yield, and quality of cauliflower. Results revealed that yield and its components increased with using each seaweed extract(3ml/l), chelated manganese (12%) at a concentration of 0.25g/l, and Agro promotor1 (substance No.48) at a concentration of 3 ml/l compared with control (untreated) treatment. Using both seaweed and chelated manganese treatments exceeded other foliar spraying treatments and caused a significant increase in fresh weight of the whole plant, leaves fresh weight,leaves dry weight percent, yield, TSS and vitamin C. The increase in total yield ranged from 12.8-48.2% by using the previous treatments as compared with control. Also, foliar sprays of seaweed extracts led to the earliness in cauliflower production as compared with the control. This study recommends using seaweed extract at a concentration of 3ml/l or chelated manganese (12%) at a concentration of (0.25g/l) for cauliflower production. Agro promotor1 (substance No.48) at a concentration of 3 ml/l can be applied in case of unavailability of seaweed extract or chelated manganese (12%).

Keywords: *Ascorbic acid, chemical content, Dry matter, marketable yield, Productivity TSS, yield quality.*

Introduction

Cauliflower (*Brassica oleracea* var. Botrytis) is one of the important vegetables among cole crops grown in Egypt. it belongs to the Brassicaceae family and it is cultivated for obtaining the curds for their high nutritional value. Cauliflower is high in vitamin C, folic acid, and antioxidants, thus can reduce the risk of various types of cancer (Zhang *et al*., 2020). The cultivated area of Cauliflower in Egypt is estimated by about 10394 feddan in 2018, which produces about 124984 tons. with an average yield of 12.025 t/fed (FAO, 2019).

The main goal of any vegetable production program is to maximize crop yield and quality to meet the growing population requirements.

The foliar application with biostimulants like seaweed extract and some micronutrients has a very important role in improving crop productivity, recovering physiological disorders, and enhancing the quality of vegetables.

Foliar application of biostimulants are being applied to enhance nutritional status, vegetative growth,

yield, and quality in some plants. Seaweed extract is a new generation of natural organic fertilizers highly nutritious that influence plant growth and development (Battacharyya *et al*., 2015) and cause an increase in yield (Dhargalkar *et al*., 2005). Seaweeds are rich in both micro and macronutrients(Shehata *et al*., 2011). Seaweed liquid extract is considered as a fertilizer supplement that contains macronutrients (small amounts of nitrogen, potassium, and phosphorus), trace elements, organic substances like amino acids, and plant growth regulators such as auxin, cytokinin, and gibberellins (Begum *et al.,* 2018).

Micronutrients play an important role in the growth and yield of cauliflower crop, hence it is as essential as macronutrients although it is required in very less amount.

Manganese has many important roles in the plant life cycle. It is involved in chlorophyll synthesis (Singh *et al*., 2018) and in the transfer of electrons and energy, hence it is considered essential in photosynthesis and respiration process, and it also works as an activator of various enzymes (Elkhatib, 2009).

Therefore, this research work aimed to assess the response of cauliflower plant's yield and quality to some growth promoters i.e., seaweeds, manganese and two chemical substances

Materials and Methods

Experimental design and treatments

The study was carried out at the Experimental Farm of Faculty of Agriculture, Assiut University, Assiut, Egypt, during 2019/2020 and 2020/2021 winter seasons. The experiments were conducted to assess the influence of seaweed, chelated manganese**,** and other two substance i.e., Agro promotor1 (substance No.48) and Agro promotor2 (substance No.50) on growth parameters and yield components characteristics of hybrid cauliflower plants (Brassica oleracea var botrytis)(snow crown) grown in clay soil.Cauliflower seedlings were planted on 26th and 30th of October in both growing seasons respectively. Seven treatments were used as a foliar application with biostimulants, microelement, and other two chemical substances which were Seaweed at rate of 3ml/l, microelement solution i.e. Manganese (Mn) in the form of Mn EDTA at the rate of 0.25 g/l (12%), Agro promotor1 (substance No.48) at the rate of 1.5 ml/l, Agro promotor1 (substance No.48) at the rate of 3 ml/l and Agro promotor2 (substance No.50) at the rate of 1.5 ml/L, Argo promotor2 (substance No.50) at the rate of 3 ml/L and control (without foliar application). Agro promotor1 (substance No.48) and Agro promotor2 (substance No.50) obtained from Cairo university. The component of substance, 48 is (sodium chloride 0.28%, organic matter 0.02%, powder of rock salts 0.01%, hypochlorite and hypochlorous acid 0.05%, electro-magnet activated water 5% and electro-magnet activated water till 100 ml. While the component of substance, 50 is (sodium chloride 0.28%, organic matter 0.02%, powder of rock salts 0.01%, hypochlorite and hypochlorous acid 0.05%, and electro-magnet activated water till 100 ml (Katouda, 2014). The experiment was conducted using three replications in random-

ized complete-block design. Each experimental plot consisted of two rows. Transplanting was spaced 40 cm apart on the northern side of 70 m wide and 3 m long ridges. Treatments were applied in November 16 and 20 respectively as first time then at 20 d intervals for three times. During soil preparation, 100 kg/fed superphosphate (15.5% P_2O_5) were added, 150 kg from ammonium nitrate (33.5%N) and 100 kg/fed superphosphate were applied after three weeks from transplanting. All agricultural practices for cauliflower crop production were applied as recommended for cauliflower production (Hassan, 1991).

Measurements

Five plants from each plot were randomly taken for recording all observations in respect of growth, yield, and curd quality.

a. Vegetative growth measurements

Plant height (cm), the number of leaves per plant, plant fresh weight (kg), leaves fresh weight(g), leaves dry weight (%), stem length, stem diameter (cm) were measured.

b. Yield and its components

Days from transplanting to harvest, curd diameter (cm), marketable yield (kg), length of the floret, and total curd yield (ton/feddan).

c. Quality measurements

Total soluble solids percentage (T.S.S%) was determined using a hand refractometer and Vitamin C content in the curd (mg/100 g) was estimated as mg/g fresh weight according to the method reported in A.O.A.C.(1990).

Statistical analysis

Data were statistically analyzed using 1998-2004 CoHort Software, CoStat Software, version 6.303.Means of the treatments were compared by Duncan's multiple range tests at 5% probability level.

Results and Discussion

Effect of, seaweed extract, chelated manganese, and chemical substances on growth parameters of cauliflower plant.

Data presented in Table 1 revealed that there were significant differences between treatments. Using seaweed extract, chelated manganese, Agro promotor1 (substance No.48), and Agro promotor2 (substance No.50) induced a positive effect on growth parameters as compared with the control.

Seaweed and chelated manganese treatments exceeded the other two foliar spraying treatments and produced the value for the fresh weight of the whole plant, leaves fresh weight, and leaves dry weight (Table 1 and 2). Also, Seaweed, chelated manganese, and Agro promotor1 (substance No.48)treatments gave higher values for plant height, stem length, and stem diameter parameters (Table1). Seaweed treatment gave the highest values for number of leaves per plant and stem diameter (Table1).

Seaweed extract is one of the bio- stimulators for plant growth and development (Patrik 2015). It contains several useful substances such as, polyphenols, polyamines, free amino acids, pigments, vitamins, micro and macro-nutrients, and promoting growth regulators (Stirk *et al*., 2014; Mahmoud *et al.,* 2019). Also, Mahima *et al.(*2018) and Sivasankari *et al*.(2006) reported that the presence of promoting growth regulators, macronutrients and micronutrients

essential for plant growth and development.

The stimulatory effect of the application of chelated manganese on the growth parameters reported in this study may be attributed to the activation of the enzymes, and also activation metabolic reactions (Pankaj *et al*., 2018). Many researchers reported that, Manganese has several important roles in plant growth and development as it accelerates seed germination, promotes root growth, increases the plant(Alejandro, 2020). Also, Przybysz *et al*.(2017) revealed that, higher concentrations of Mn in the growing medium led to a significantly higher activity of antioxidative enzymes, and the content of phenolic compounds in lettuce.

According to the effect of the chemical substance on growth parameters, Agro promotor1 (substance No.48) was superior to Agro promotor2 (substance No.50). It gave higher values of plant fresh weight, plant height and number of leaves per plant (Table 1 and 2). Agro promotor1 (substance No.48) accelerating growth parameters as it increased significantly stem length and stem diameter (Table 1 and 2).

Using different concentrations i.e., 1.5 and 3 ml/l induced significant effect on growth parameter such as, plant height, fresh plant weight and number of leaves/ plant. Application of Agro promotor1 (substance No.48) at concentration of 3 ml/l gave higher values for plant height, number of leaves per plant and stem diameter parameters than using of Agro promotor1 (substance No.48) at concentration of 1.5 ml/l (Table 1 and 2). The control treatment was associated with the lowest values of vegetative growth characters parameters in the two seasons of study.

Table 1. Plant fresh weight(kg), Plant height(cm), and No. of leaves/pl. of snow crown hybrid cauliflower as affected by seaweed extract, chelated manganese, and chemical substances treatments during 2019/2020 and 2020/2021 seasons

Treatments	Plant fresh weight(kg)	Plant height(cm)	No. of leaves/pl.
	Season 1		
Seaweed(3ml/l)	3.80 a	61.67 a	21.3a
Mn (0.25 g/l)	3.60 a	60.33 a	18 bc
*48,(1.5 ml/l)	2.60 bc	58.33 ab	19.3 abc
48,(3 ml/l)	2.80 b	60.33 a	20 ab
**50,(1.5 ml/l)	2.50 bc	55.00 b	17.7 bc
50,(3 ml/l)	2.77 b	58.67 a	18.7 bc
Control	2.67 c	51.00 c	17 c
	Season 2		
Seaweed(3ml/l)	3.70 a	59.33 a	21 a
Mn (0.25 g/l)	3.57 a	57.67 ab	19 ab
*48,(1.5 ml/l)	2.50 bcd	54.33 c	19.3 ab
48,(3 ml/l)	2.80 b	58.33 ab	21.7 a
**50,(1.5 ml/l)	2.43 cd	54.00 c	18 b
50,(3 ml/l)	2.70 bc	55.33 bc	19 ab
Control	2.30 d	49.00 d	17.7 b

Means within column followed by the same letter(s) are not significantly different at 0.05 level of probability.
*Agro promotor1 (substance No.48). ** Agro promotor2 (substance No.50).

Table 2. Leaves fresh weight(g), Leaves dry weight%, Stem length(cm), and Stem diameter(cm) of snow crown hybrid cauliflower as affected by seaweed extract, chelated manganese, and chemical substances treatments during 2019/2020 and 2020/2021 seasons

Treatments	Leaves fresh weight (g)	Leaves dry weight (%)	Stem length (cm)	Stem diameter (cm)
	Season 1			
Seaweed(3ml/l)	1.82 a	10.50 a	12.67 a	4.03 a
Mn (0.25 g/l)	1.78 a	8.52 ab	11.00 b	3.73 abc
*48,(1.5 ml/l)	1.33 bc	7.77 b	12.33 a	3.63 bc
48,(3 ml/l)	1.40 bc	8.07 b	12.33 a	3.93 ab
**50,(1.5 ml/l)	1.25 bc	7.03 b	10.33 b	3.60 c
50,(3 ml/l)	1.42 b	8.10 ab	11.00 b	3.60 c
Control	1.18 c	6.73 b	10.67 b	3.27 d
	Season2			
Seaweed(3ml/l)	1.80a	10.33 a	13.33 a	4.00 a
Mn (0.25 g/l)	1.78 a	10.30 a	12 .00abc	3.90 abc
*48,(1.5 ml/l)	1.31 bc	7.53 bc	12.33 abc	3.70bcd
48,(3 ml/l)	1.42 b	8.17 b	13.00 ab	3.97 ab
**50,(1.5 ml/l)	1.28 bc	7.27 bc	11.67 bc	3.60 d
50,(3 ml/l)	1.37 b	7.70 b	11.67 bc	3.67 cd
Control	1.17 c	6.67 c	11.33 c	3.27 e

Means within column followed by the same letter(s) are not significantly different at 0.05 level of probability.
*Agro promotor1 (substance No.48). ** Agro promotor2 (substance No.50).

Effect of seaweed extract, chelated manganese, and chemical substances on Yield Components of cauliflower plant.

The number of days from transplanting to harvest is a very important parameter as the crop growing period is reducing. It was observed that curd was reached to harvesting stage within 65and 60.33 days after transplanting in case of seaweed treatment in first and second seasons respectively. Whereas significant delay production was recorded in the control treatment and Agro promotor2 (substance No.50) at a concentration of 1.5ml/l in the first season, while in the second season only control treatment was delayed (Table 3).Seaweed and chelated manganese (12%) at concentration of 0.25g/l treatments gave thehighest significant values for marketable curd weight and total curd yield than chemical substance treatments (Table 3).

Foliar application with seaweed at a concentration of 3ml/l and chelated manganese (12%) at concentration of 0.25g/l treatments were the superior treatments regarding the total yield parameter as they increased total yield by 44.9% and 41.7% in the first season of study, while the increment in the total yield were 51.5% and 48.6% respectively in the second season as compared with control treatment (Fig.1). Agro promotor1 (substance No.48) was superior to Agro promotor2 (substance No.50) as it gave the highest values for marketable curd weight and total yield (ton/fed). Foliar spraying with Agro promotor1 (substance No.48) at concentration of 3ml/l came in the third rank as it increased total curd yield by 21.4% and 29.6% in the first and second seasons respectively. These results may be due to the increase of the promotion in plant fresh weight, fresh weight leaves which reflected in a significant increase of the total curd yield. Many researchers revealed that, bio stimulatory compounds had positive effect on crop performance and yield. Chaudhari *et al.* (2017) reported that the highest curd diameter and marketable curd yield were recorded as a result of foliar spraying with micronutrients. Also, Moklikar *et al.* (2018) found that the highest yield production of cauliflower was recorded by foliar application of micronutrients. Also, Al-Burmani, 2017 revealed that, seaweed extracts are helpful in formation of strong vegetative growth due to stimulating better absorption of water and nutrients from the soil (Al-Burmani, 2017) and increasing the efficiency of photosynthesis (Travena 2007).

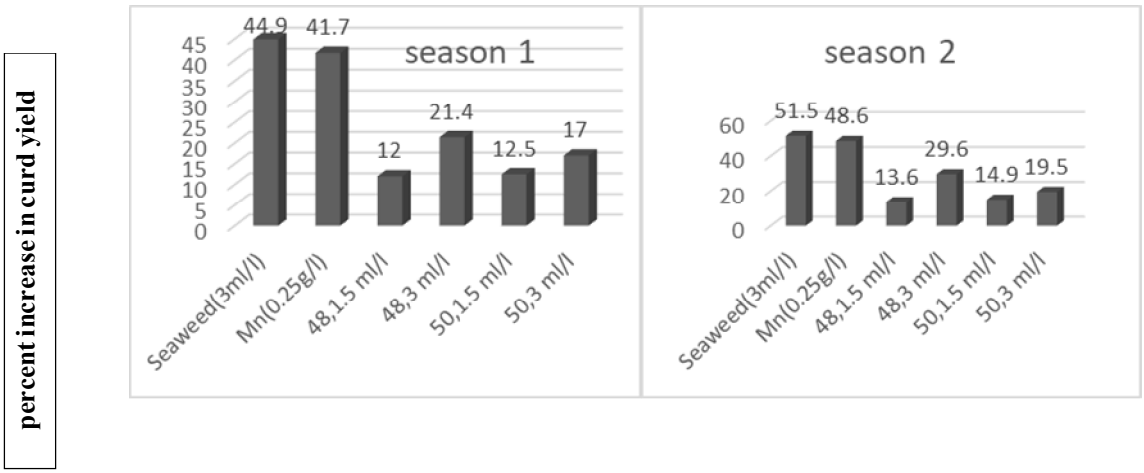

Fig. 1. Percentage of increase in total curd yield treated with seaweed extract, chelated manganese, and chemical sub
stances treatments as compared to the un-treated (control) treatment.

Table 3. Days from transplanting to harvest, Curd diameter(cm), Floret length(cm), Marketable curd weight(kg) and Total curd yield(ton/fed.) of snow crown hybrid cauliflower as affected with seaweed extract, chelated manganese, and chemical substances during 2019/2020 and 2020/2021 seasons

Treatments	Days from trans-planting to harvest	Curd diameter (cm)	Floret length (cm)	Marketable curd weight(kg)	Total curd yield (ton/fed.)
		Season 1			
Seaweed(3ml/l)	65.00 b	38.00 a	7.33 c	1.42a	8.80 a
Mn (0.25g/l)	67.33 ab	35.33 b	7.67 bc	1.40 a	8.60 a
***48,1.5 ml/l**	67.33 ab	33.33 bc	9.33 a	1.10c	6.80 bc
48,3 ml/l	67.33 ab	35.00 b	8.67 ab	1.30 ab	7.37 b
****50,1.5 ml/l**	74.33 a	32.33 c	8.33 abc	1.13 bc	6.83 bc
50,3 ml/l	69.67 ab	33.67 bc	8.00 bc	1.20 bc	7.10 b
Control	74.33 a	31.33 c	9.33 a	0.90 d	6.07 c
		Season2			
Seaweed(3ml/l)	60.33 c	36.00 a	7.33 ab	1.43 a	8.53 a
Mn (0.25g/l)	62.67 bc	35.00 a	7.33 ab	1.33 ab	8.37 a
***48,1.5 ml/l**	65.00 abc	33.00 bc	8.33 a	1.00 cd	6.40 c
48,3 ml/l	62.67 bc	34.67 ab	8.00 ab	1.17 bc	7.30b
****50,1.5 ml/l**	69.67 ab	31.67 cd	7.67 ab	0.97 de	6.47 c
50,3 ml/l	69.67 ab	32.67 cd	7.67 ab	1.03 cd	6.73 bc
Control	72.00 a	31.00 d	8.33 a	0.80 e	5.73 d

Means within column followed by the same letter(s) are not significantly different at 0.05 level of probability.
*Agro promotor1 (substance No.48). ** Agro promotor2 (substance No.50).

Effect of chelated manganese, seaweed extract, and chemical substances on yield quality of cauliflower plant.

Total soluble solids were significantly affected by the treatments in both seasons, seaweed extract, chelated manganese and Agro promotor1 (substance No.48) at concentration of 3ml/l treatments had the highest TSS content of all treatments (Table 4). On the other hand, plants that received chemical substances' foliar application had significantly higher TSS than control treatment except for Agro promotor2 (substance No.50) at a concentration of 1.5 ml/l in both seasons (Table 4).

Regarding vitamin C content, chelated manganese treatment had significantly the highest value for vitamin C content in the second season while in the first season the difference between chelated manganese, seaweed and Agro promotor1 (substance No.48) at concentration of 3ml/l treatments was not siginificant (Table 4). Moklikar *et al.* (2018) showed that, the highest significant values for TSS and ascorbic acid content were recorded by foliar spraying with $FeSO_4$ 0.5% + Borax 0.2% + $ZnSO_4$ 0.5%.

Table 4. TSS content, and Vitamin C content of snow crown hybrid cauliflower as affected by seaweed extract, chelated manganese, and chemical substances during 2019/2020 and 2020/2021 seasons

Treatments	TSS		Vitamin C	
	Season 1	Season 2	Season 1	Season 2
Seaweed(3ml/l)	4.87 a	4.79 a	45.92 ab	45.73 bc
Mn (0.25g/L)	4.84 a	4.73 a	47.83 a	46.87 a
***48,(1.5 ml/l)**	4.37 b	4.50bc	42.73 c	44.83 de
48,(3 ml/l)	4.57ab	4.67 ab	45.60 ab	46.53ab
****50,(1.5 ml/l)**	4.00 cd	4.07d	43.47 bc	44.73e
50,(3 ml/l)	4.27 bc	4.40 c	44.33 bc	45.67de
Control	3.83 d	4.00 d	42.50 c	44.07 e

Means within column followed by the same letter(s) are not significantly different at 0.05 level of probability.

*Agro promotor1 (substancNo.48). **Agro promotor2 (substance No.50).

Conclusion

Foliar application with seaweed extract or chelated manganese treatments was accompanied by an increase in the cauliflower yield and quality.Also, the application of seaweed extracts led to the earliness in cauliflower production. It could be concluded that the application of seaweed extract at a concentration of 3ml/l or chelated manganese (12%) at a concentration of (0.25g/l) was recommended for cauliflower production.

Refrences

AOAC (1990). Official Methods of Analysis. 15th Ed. Association of Official Analytical Chemists, Inc., Virginia, USA, pp: 770-771.

Al-Burmani, Khaled A. (2017). Effect of organic waste and seaweed extract on broccoli growth and yield. Master Thesis. Faculty of Agriculture. Al Qasim Green University, Iraq.

Alejandro, S, Höller S, Meier B and Peiter E (2020). Manganese in Plants: From Acquisition to Subcellular Allocation. Front. Plant Sci. 11:300.

Battacharyya, D.; Babgohari, M.Z.; Rathor, P.; Prithiviraj, B.(2015). Seaweed extracts as biostimulants in horticulture. Sci. Hortic. 196, 39–48.

Begum, M.; B.C. Bordoloi ; D.D. Singha and N.J. Ojha (2018). Role of seaweed extract on growth, yield, and quality of some agricultural crops: A review. Agric. Rev., 39(4): 321-326.

Chaudhari, V.J., NK Patel, BM Tandel and Chaudhari V.(2017). Effect of foliar spray of micronutrients on growth and yield of cauliflower (*Brassica oleracea* L. var. Botrytis). IJCS . 5(6): 1133-1135.

Dhargalkar VK, Pereira (2005). N, and Seaweed: promising plant of the millennium, Sci. Cult., 71, 60- 66.

Elkhatib, H.A., (2009). Growth and yield of common bean (*Phaseolus vulgaris* L.) in response to Rhizobium Inoculation, nitrogen and molybdenium fertilization. Alex. Sci. Exchange J., 30: 319- 332.

FAO (2019). Food and Agriculture Organization. Faostat, FAO Statistics Division, November, 2019.

Hassan, A.A. (1991). Production of vegetable crops.1st ed., Published by Arab House for Publishing and Distribution, Cairo, Egypt. (In Arabic).

Kaoud, H.A. (2014). Patent. Agropromotor 1 and 2.Fac. vet.cairo university- Egypt.

Mahima, B., Bijnan C., Dhiman D. and Nayan J.(2018). Role of seaweed extract on growth, yield and quality of some agricultural crops: A review. Agricultural Reviews.(39):321-326.

Mahmoud, S. H., Dina M.Salama A. M.M.El-Tanahy and E. H. Abd El-Samad. (2019). Utilization of seaweed (*Sargassum vulgare*) extract to enhance growth, yield and nutritional quality of red radish plants. Annals of Agricultural Sciences. (64)167-175.

Moklikar, M.S., D. P. Waskar, M. M. Maind and V. K. Bahiram.(2018). Studies on Effect of Micronutrients on Growth and Yield of Cauli-Flower (*Brassica oleracea* var. botrotis) cv. Sungro-Anandi. Int. J.Curr.Microbiol.App.Sci Special Issue-6: 2351-2358.

Pankaj P, Kujar PK, Saravanan S. (2018). Effect of different micronutrient on plant quality of broccoli (*Brassica oleracea* var. italica) CV green magic. Journal of Pharmacognosy and Photochemistry. 1:2825-2828.

Patrick du Jardin. (2015). Plant biostimulants: Definition, concept, main categories and regulation. Scientia Horticulturae (196): 3-14.

Przybysz A., Wrochna M., Gawrońska H., Małecka-Przybysz M., Pietrzyk S., Gawroński S.W. (2017). Effect of manganese on yield and quality of hydroponically grown lettuce. J. Elem., 22(1): 315-327.

Shehata, S.M.; Heba, S.A.; Abou El-Yazied, A.; El-Gizawy, A.M. (2011). Effect of foliar spraying with amino acids and seaweed extract on growth chemical constitutes, yield and its quality of celeriac Plant. Eur. J. Sci. Res. 58, 257–265.

Singh S, Bairwa H, Gurjar SC, Kumar H, Jangir M, Bagri UK.(2018). Effect of Foliar Spray of Micronutrients on Uptake of Micronutrients

in (*Solanum esculemntum* Mill.) cv. Navoday. Int. J Curr. Microbiol. App. Sci. 7:930- 933.

Sivasankari, S.; Venkatesalu, V.; Anantharaj, M.; Chandrasekaran, M. (2006). Effect of seaweed extracts on the growth and biochemical constituents of *Vigna sinensis*. Bioresour. Technol. 97, 1745–1751.

Stirk, W.A., Tarkowská, D., Turečová, V., Strnad, M., Van Staden, J., (2014). Abscisic acid, gibberellins and brassinosteroids in Kelpak, a commercial seaweed extract made from Ecklonia maxima. J. Appl. Phycol. 26, 561–567.

Travena, R.G. (2007). Seaweed fertilizer for the organic farmer biobauer Bio Magic Priory gardens. Derby. DE 2014Tg.

Zhang, NQ, Mo XF, Lin FY, Zhan XX, Feng XL, Zhang X, Luo H, Zhang CX. (2020). Intake of total cruciferous vegetable and its contents of glucosinolates and isothiocyanates, glutathione S-transferases polymorphisms and breast cancer risk: a case-control study in China. Br J Nutr. 28; 124(6):548-557.

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تأثير مستخلص الطحالب البحرية، المنجنيز المخلبى والمواد الكيميائية على صفات النمو، المحصول ومكوناتة فى القنبيط

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الملخص

اجريت هذة الدراسة بمزرعة الخضر البحثية – كلية الزراعة – جامعة اسيوط وذلك خلال الموسمين الزراعيين 2019–2020 ، 2020–2021 لدراسة تأثير رش مستخلص الطحالب البحرية، المنجنيز المخلبى وكذلك نوعين من المواد الكيميائية (مادة 48 ومادة 50) علي النمو والمحصول ومكوناتة فى صنف القنبيط الهجين سنوبول كراون.

وكان الرش بمعدل 3 ملى/لتر من مستخلص الطحالب البحرية وبالمنجنيز المخلبى(12%) 0.25جرام/لتر وكذلك الرش بمادة 48، مادة 50 بتركيز 1.5 ملى/لتر، 3 ملى/لتر وتم الرش 3 مرات خلال موسم النمو.

واوضحت النتائج الاتى:

كان لكل من مستخلص الطحالب البحرية، المنجنيز المخلبى والمادة الكيميائية 48 بتركيز 3 ملى/ لتر تأثير واضح على صفات النمو والمحصول ومكوناته مقارنة بالكنترول. فكان لهما تأثير على طول النبات ووزنة، وعدد الاوراق، وقطر القرص. وايضا على وزن القرص الصالح للتسويق والمحصول الكلى وكذلك المواد الذائبة الكلية وحمض الاسكوربيك مقارنة بمعاملة الكنترول. ونستخلص من ذلك بأن استخدام كلا من مستخلص الطحالب البحرية، المنجنيز المخلبى والمادة 48 ادى الى تحسين النمو والمحصول والجودة فى القنبيط. فلقد زاد المحصول الكلى بمقدار12.8–48.2% عن معاملة الكنترول عند استخدام معاملات الرش المختلفة فتراوحت الزيادة فى المحصول الكلى ما بين 44.9 و51.5% عند استخدام مستخلص الطحالب البحرية، تراوحت ما بين 41.7–48.6% عند استخدام المنجنيز المخلبى.

لذلك توصى الدراسة باستخدام مستخلص الطحالب البحرية والمنجنيز المخلبى للحصول على أعلى محصول صالح للتسويق، وفى حالة عدم توفرهذة المعاملة يمكن استخدام المادة الكيميائية 48 بتركيز 3 ملى/ لتر.