Effect of Anti saline Addition and Humic Acid Spraying on the Vegetative Growth of Cauliflower of Nahar Cultivar

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Abstract

One of the farms in Muqdadiyah province, Al-Harouniya district, Kilo (21), which is located about 40 kilometers north-east of Baqubah province in the governorate of Diyala, conducted a randomized complete-strips experiment during the agricultural season (2019-2020) to investigate the effects of supplementation or anticline use and humic acid lion spraying on the characteristics of the farm's harvested crop. Cauliflower of the Nahar kind vegetatively grows. The results showed that the addition of anticline to the soil was more effective than the N2 treatment in most of the traits studied, such as plant height (78.87cm), leaf number (21.10 leaves), stem diameter (22.55 mm), percentage of dry matter in leaves (15.10%), and leaf area (289.27 square centimeters per plant), with each treatment improving upon the previous one. The N2H2 treatment resulted in the best outcomes for the reaction between the two elements across the board. The control treatment yielded the following results regarding stem diameter, dry matter percentage in leaves, and leaf area: (93.02 cm, 24.83 leaf-1, 28.79 mm, 17.46%, 337.78 dm2 plant-1).

Keywords: *salt processor, foliar nutrition, humic acid, cauliflower*

INTRODUCTION

Cauliflower, or Brassica oleracea var. var. botrytis L. It is a member of the cruciferous family Brassicaceae, which has more than 350 genera and around 4000 species distributed across various regions of the world, including the temperate zones of the northern hemisphere, and is one of the most significant winter vegetable crops. It was first observed in the broccoli plant (Hassan, 1991). The cauliflower planting area reached 3955 dunums, with a productivity of 7187 tons based on disc color and bud hue (Poras et al., 2006). (Central Statistics Organization, 2019). Antisaline is a ready-to-use liquid fertilizer that originates in Cyprus, southern Europe, and the Mediterranean basin. It solves the problem of accumulated salt without building impenetrable layers by keeping the salt where it naturally occurs in the soil, where it can't damage crops by rising to the surface. Because its effectiveness declines below 5 degrees Celsius, it is not added at those temperatures. Antisaline has been shown to have a significant impact on safeguarding salty land, which can be used to boost agricultural output by lowering the

amount of water lost to evaporation and groundwater. They also discovered that it conserves available water, which helps prevent salty sea water from being blown onto farmland. Paper-backed feeding, also known as paper-backed fertilization, provides a plant with nutrients in the soil by spraying such nutrients on the leaves, which can absorb them through the stomata of leaves (Ahmed, Salem, 2020). When applied to soil, organic fertilizers aid in nutrient uptake by plants through the stomata in their leaves (Rajasekar et al., 2017). (Rachid et al., 2020) Recent empirical studies have to Remember the importance of nutrition from the soil via roots while appreciating the rapid arrival of nutrients to the leaf's tissues through leaf feeding, which is both active and effective when compared to soil fertilization (Bader et al., 2020). Some of the many ways in which humic acid contributes to plant health include its role in inhibiting ethylene production and its inverse effect on abscisic acid in the opening and closing of stomata (Abdullah et al., 2017). In addition to its wonderful and useful features, the non-biogenic causes an increase in the leaves' healthy, chlorophyll pigment, and carotene content (Kaya et al., 2018). The addition of this acid plays an important role in preparing the plant in saline soils with nutrients by improving the metabolic processes of the plant and because it leads to an increase in oxygen activity, both of which play a major role in stimulating plants for growth and production (Saifzadah et al., 2011) and in protecting plants from saline stress, water stress, and heavy metal stress (Asgharei, Khosbakht, 2015). (Al-Azzawi, 2020).we therefore Knowing the result of adding anticline and finding the optimal concentration , realize how much humic acid to use and what concentration works best for your situation and Understanding the impact of team members working together and figuring out how to deploy them best is a three-part skill.

Materials and methods

In the 2019-2020 agricultural season, researchers in the governorate of Baqubah experimented with one of the farms located in Muqdadiyah, province Al-Harouniya district, Kilo 21, 40KM north-east of Baqubah, to determine the effect of supplementing or using anticline and spraying humic acid lion on the characteristics of a crop. Cauliflower of the Nahar kind vegetatively grows. The experimental farm was prepared by first horizontally tilling the land, leveling it, vertically tilling it again, and flattening it. It was divided into three strips, with nine experimental units in each, for a total of twenty-seven, with each unit having dimensions of (3 2) and a separation distance of 1 m from its neighbor. Within the experimental unit, irrigation pipes were extended such that there was a distance of 2 meters between adjacent strips, and a distance of 40 centimeters was left between seeds planted on opposite sides of the strip.

Table 1: Shows the results of the analysis of the chemical and physical properties of the study soil before planting.

Adjective	value	unit
(1:1) Electricity	1.92	EC
(1:1) degree of interaction	7.57	
Organic matter	1.96	%
Ready items		
ready-made nitrogen	45.18	ML^{-1}
ready-made phosphorous	12.24	
ready-made potassium	192.92	
ready iron	3.47	

bulk density		1.4	M.E. K-3
Soil			
	((clay	52.4	K.M-1
	(silt)	8.8	
	(sand)	38.8	
soil texture		(Silty loam)	

Results and discussion

1. Plant height (cm):

The addition of anticline to Treatment N2 (shown as 78.87 cm in Table 2) significantly outperformed the control group (Treatment N0; 60.82 cm) by a wide margin. Treatment N2H2 had the highest value for the interaction between the two components (93.02 cm), whereas treatment N0H0 had the lowest value (52.57 cm).

Table 2: Effect of adding anticline and spraying humic acid on plant height (cm) on vegetative growth characteristics of Nahar cauliflower.

	H0	H1	H2	
N0	52.57 f	63.09 E	66.80 de	60.82 C
N1	65.20 de	70.57 Cd	77.50 b	71.09 B
N2	66.91 de	76.69 Bc	93.02 a	78.87 A
	61.56 C	70.12 B	79.10 A	

P » P = 0.05

2. Number of Leaves (Leaf-1)

Table 3 shows that when anticline was added to Treatment N2, the number of leaves per plant increased to 21.10 from 17.02 in the comparison Treatment N0, and that adding humic acid to Treatment H2 increased the number of leaves per plant to 20.93 from 17.02 in Treatment N2. Regarding the interaction between the two variables, the highest value was in treatment N2H2, which amounted to 24.83 leaf-1, compared to the comparison treatment N0H0, which amounted to 15.87 leaf-1, on the factor H0, which amounted to 16.62 leaf-1.

Table 3: Effect of adding anticline and spraying humic acid on the number of leaves (Leaf-1) on the vegetative growth characteristics of cauliflower cultivar Nahar

	H0	H1	H2	
N0	15.87 d	17.11 D	18.09 cd	17.02 B
N1	16.47 d	17.99 Cd	19.88 bc	18.11 B
N2	17.52 d	20.94 B	24.83 a	21.10 A
	16.62 C	18.68 B	20.93 A	

P » P = 0.05

3. Diameter of the plant stem (mm)

It is evident from the results of Table (4) that there is a significant difference when adding anticline when treatment N2, which amounted to 22.55mm,غ over control treatment N0, which amounted to 17.54MM, and the superiority of adding humic acid lion when treatment H2, which amounted to 25.89 mm over control treatment H0, which amounted to 18.20 mm, while the overlap Among the workers, the highest value was in the N2H2 treatment, which amounted to 28.79mm, over the comparison treatment N0H0, which amounted to 17.95 mm.

Table 4: Effect of adding anticline and spraying humic acid on stem diameter (mm) on vegetative growth characteristics of Nahar cultivar broccoli.

	H0	H1	H2	
N0	17.95 c	18.64 C	26.76 ab	17.54 C
N1	18.02 c	19.98 C	22.12 bc	19.65 B
N2	18.64 c	20.22 C	28.79 a	22.55 A
	18.20 B	19.59 B	25.89 A	

P » P = 0.05

4. Leaves dry matter percentage (%)

Table (5) shows that there is a significant difference between the addition of anticline to treatment N2 (15.10% vs. 11.47% for the control treatment N0) and the addition of humic acid lion to treatment H2 (14.79% vs. 11.72% for the control treatment H0). The highest value was in the treatment N2H2 (17.46% vs. 11.47% for the comparison treatment).

Table 5: Effect of adding anticline and spraying humic acid on the dry matter percentage in leaves (%) on the vegetative growth characteristics of Nahar cultivar cauliflower.

	H0	H1	H2	
N0	10.06 c	11.95 Bc	12.41 bc	11.47 C
N1	11.87 bc	13.00 Bc	14.52 b	13.13 B
N2	13.24 b	14.61 B	17.46 a	15.10 A
	11.72 B	13.19 B	14.79 A	

P » P = 0.05

5. Leaf area (dm² plant-¹):

Based on the data in Table (6), it is clear that the addition of anticline during treatment N2 significantly increased yields (from 221.23 to 289.27 dm2 plant-1) compared to the control treatment N0 (which reached 221.23 dm2 plant-1) and that the addition of humic acid during treatment H2 significantly increased yields (from 303.85 to 289.27 dm2 plant-1). The highest value for the interaction between the two components was found in treatment N2H2, which amounted to 337.78 dm2 plant-1, compared to the comparison treatment N0H2, which amounted to 186.52 dm2 plant-1.

Table 6: Effect of adding anti-saline and spraying humic acid lion on leaf area (dm2 plant-¹) on the vegetative growth characteristics of cauliflower cultivar Nahar

	H0	H1	H2	
N0	186.52 f	221.14 Ef	256.05 de	221.23 B
N1	239.05 de	269.66 Cd	317.73 ab	275.48 A
N2	233.51 de	296.52 Cd	337.78 a	289.27 A
	219.69 C	262.44 B	303.85 A	

indicate p> 0.05

Tables 2, 3, 4, and 6 show a clear improvement after anticline treatment was implemented. This improvement is attributable to the antisaline's function as a salinity buffer, which is achieved through anticline-specific management practices that maximize irrigation efficiency, limit water waste, and alleviate water scarcity in arid regions (2020) Antisaline is thought to reduce crop water stress and maximize yield, cut down on irrigation delivery costs, boost efficiency in the use of soil moisture, and cut down on fertilizer waste by limiting surface runoff and seepage. Since irrigation water contains salts, increasing irrigation means adding quantities of salts to the soil, increasing crop yield and yield quality, decreasing waterlogging issues, and controlling root-zone salinization issues are all benefits (Broner,

2005). Many physiological changes are brought on by water stress, which is thought to occur when there is a shortage of available soil water due to ongoing losses of moisture through transpiration and evaporation. And the chemical in the plant that causes a reduction in plant growth, most notably a diminution in leaf size, stem length, root spread, and water usage efficiency (Farooq etal., 2009). The plant's hormone levels shift during cell elongation and division, causing the stomata to shut by reducing cytokinin in the roots and raising abscisic acid. Some theories state how to overcome the problem of salinity and activate the anti-saline action in its explicit form through spraying with potassium sulfate fertilizer mediated by reducing effort Osmosis of the leaves or improving the nutrition of the host, thus increasing the plant's tolerance to salinity (Jaleel et al., 2009).

Potassium's significance stems from its involvement in numerous physiological processes, most notably the transport and storage of represented compounds and water relations inside salinity-affected plant tissues. These findings corroborate those of (Yordanov et al., 2003) and (Mahdi et al., 2010), as shown by the identical tables up top. The findings corroborate those of (Khan et al., 2003). They can be explained by the fact that acetic acid, along with other growth regulators like phenolic compounds, plays a crucial role in the process of cell division and growth, which in turn increases the plant's height, characteristics of vegetative growth, and yield. There is an agreement between these findings and those of (Al-Sahhaf et al., 2017) and (Said, 2017). According to popular belief, humic acid plays a crucial part in plants as a hormone that activates enzymes. They are in charge of the carbon metabolism process, which in turn causes an increase in the accumulation of processed nutrients in the plant, which in turn pushes the plant to increase the features of the vegetative development and the yield. The findings are consistent with (Alabbasi et al., 2015). Spraying this acid causes a rapid process of carbon metabolism, which in turn increases plant growth, which in turn increases vegetative growth characteristics and yield (Hegazi and Elshraiy, 2007; Al-Qaisi et al., 2012; Al-Tamimi, 2015); and its role in increasing the absorption of carbon dioxide, which contributes to the process of carbon metabolism, which reflects on the increase in plant growth (Al-Obaidi, 2013). plant and raise production rates; these findings corroborate those of (Kumar et al., 2010). (Abdi, 2011).

Conclusions

1-The addition of anticline at a concentration of (2 mL (provided

the greatest results in almost all of the studied features.

2-The addition of humic acid at a concentration of (4 mL (provided the greatest results in almost all of the studied features.

3-In The reaction between anticline and humic acid, the concentrations (4.2 ml) provided the greatest results in almost all of the studied features.

Recommendation

1-Add an anti-salinity with a concentration of (2 m/L) because he gave the best results in most of the studied qualities

2-Add a Humic Acid Lion with a concentration of (4 m/L) because he gave the best results in most studied qualities

3-The overlap between the salinity anti-salinity and acid lion recommends adding concentrations (4.2) m/L). They gave the best results in most of the studied qualities.

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