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Effect of Anti-Salinity On Growth, Yield and Fruit Quality of Le-Conte Pear (*Pyrus communis* L.) Trees in New Valley

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ABSTRACT

This investigation was carried out during two successive seasons (2021 and 2022) on the 5 -year- old of 'Le-Conte' pears cultivar grown in a private orchard located at Farafra Oasis, New Valley governorate to study the effects of anti-salinity, foliar application treatments (Salicylic acid at 100ppm and 200ppm and Citric acid at 500ppm and 1000ppm) and soil application treatments (effective microorganism 50ml and 75ml and humic acid 25ml and 50ml) and their interaction on growth, yield and fruit quality, of Le-Conte' pear trees under heat stress conditions. The best results were recorded that citric acid at 1000 ppm with humic acid at 50 ml/tree recorded highest significant values where improved shoot height, shoot diameter, number of leaves per shoot, leaf area, chlorophyll a, chlorophyll b, total chlorophyll in leaf, carotenoids, fruit set %, number of fruit/tree, yield kg/ tree, yield (ton/feddan), fruit weight, fruit volume, fruit length, fruit diameter, fruit shape index, fruit firmness, T.S.S., T.S.S./acid ratio, total sugar, reducing suger , nun reducing sugar and (vitamin C). Leaf nitrogen, phosphorus, potassium, calcium, magnesium, iron, zinc and, sodium, chloride and proline and reduced acidity of fruit juce of Le-Conte' pears trees under heat stress conditions.

Keywords: 'Le-Conte' pear, anti-salinity, foliar application, Salicylic acid, Citric acid, soil application, effective microorganisms**,** humic acid, yield and fruit quality

1. Introduction

The pear (*Pyrus communis* L.) plant is scientifically known as Pyrus communis, stands among the enduring deciduous trees with a legacy spanning centuries. Belonging to the Rosaceae family, which encompasses around 100 genera, Pyrus holds a distinguished place with approximately 22 species, with communis being one of the most prominent. Originating from the region of Central Asia, this species traversed continents, becoming an emblematic fruit tree in diverse landscapes globally. Renowned for its economic significance, the pear's fruit holds substantial nutritional value alongside medicinal properties, rendering it a prized entity in both culinary and therapeutic realms. The problem of increasing the salinity of irrigation water in recent time is one of the most common problems. These plants are clearly affected by increasing the salinity (Hanfy *et al.* 2019), results showed that the highest values of vegetative growth parameters, were gained with the interaction treatments of 750 or 1000 mg/L from acetyl salicylic acid combined with 6 kg. feddan from humic acid without significant difference between both treatments on *Origanum syriacum* L. plants grown under saline water irrigation stress with 750 mg/L acetyl salicylic acid with applying 6 kg. feddan from humic acid to avoid the depressive effect of salinity on growth and productivity of *Origanum syriacum* L. plants.

Many different types of mechanisms and modern methods were used in order to improve and increase plant resistance to these stresses or inappropriate environmental conditions. Salicylic acid is a signaling or messenger molecule in plants and induces plant tolerance against various biotic and abiotic stresses (Horvath *et al.,* 2007). Among these mechanisms is the spraying of salicylic acid (Al-Taey 2009). Salicylic acid is considered one of the natural plant hormones and is also characterized by its physiological roles of importance in the growth and flowering of the plant and the absorption of ions and its role in opening and closing stomata and its opposite effect to Lateef, (2021).

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Citric acid plays an essential role in signal transduction system, membrane stability and functions, activating transporter enzymes, metabolism and translocation of carbohydrates. In addition, it consider as one of non-enzymatic antioxidants which act to eliminate free radicals produced in plants under stress (Yan-Lin and Soon, 2001).

EM contains selected species of microorganisms including three principal types of organisms namely lactic acid bacteria, yeast actinomyces and photosynthetic bacteria that are commonly found in soils Higa, (1991). In order to increase productivity in plant production in saline soils, soil characteristics need to be improved by adding organic matter Asık *et al.,* (2009). All of these are mutually compatible with one another and can coexist in liquid culture Higa and Wididana, (1991). The basic purpose of EM is the restoration of healthy ecosystem in both soil and water by using genus of microorganisms which are found in nature. Generally, EM technology has been adopted globally and is recognized as a powerful and effective tool in both agriculture and horticulture for crop and animal production systems Chamberlain *et al.,* (1997). EM is used to improve soil fertility and plant growing conditions (Higa, 1991 and Higa and Wididana, 1991).

Many investigators reported that humic acid applications led to a significant increase in soil organic matter which is improves plant growth and crop production. Erik *et al.* (2000) on onion plant and Hafez (2003) on squash, found that the dry matter yield of barley plants grown on sandy and calcareous soils was significantly increased with increasing the addition rate of humic acid from 450 to 900 mg/kg soil. The mechanism of humic acid increasing cell membrane permeability, oxygen uptake, respiration, photosynthesis, phosphate uptake and root cell elongation of plant growth factors have been proposed by some authors to explain positive effect of humic acid (Vaughan, 1974; Cacco and Dell Agnolla, 1984; Russo and Berlyn, 1990). Humic acids may stimulate shoot and root growth, and improve resistance to environmental stress in plant, but the physiological mechanism has not been well established (Delfine *et al.,* 2005). Türkmen *et al.* (2005) suggested that humic acid may promote much growth of pepper seedlings in salty condition. The effect of water shortage and salt level, use of humic substances for removing negative effects of elements in toxic quantities, and effects on plant growth were studied Asık *et al.,* (2009). Humic acid application decreases adverse effects of salt.

This investigation aimed to study the effect of some anti-salinity treatments of salicylic acid and citric acid as a foliar application, also effective microorganism and humic acid as soil application and their combination on vegetative growth and productivity of pear trees under saline conditions.

2. Material and Methods

This investigation was carried out during two successive seasons (2021and 2022) on the 5 -year-old of 'Le-Conte' pears cultivar grown in a private orchard located at Farafra Oasis– New valley governorate planted at 4.0X 6.0 meters apart, grown in sandy soil (approximately 175 plants per feedan) and subjected to irrigation with drip irrigated water. Physical and chemical analyses of the experimental soil were shown in Table (1) and the chemical analyses of the used irrigation water is recorded in table (2) to study the effects of anti-salinity, foliar application treatments (Salicylic acid 100 ppm, 200 ppm and Citric acid 500 ppm, 1000 ppm) and soil application treatments (effective microorganism at 50 ml, 75 ml and humic acid at 25 ml, 50 ml) on growth, yield and fruit quality.

Table 1: Analysis of experimental soil.

Soil Depth (cm)	Texture Class	pH Soil past	E.Ce (dSm^{-1})	Organic matter %			
0-30	Sand	8.07	1.55	0.21			
30-60	Sand	7.82	8.47	0.19			
Cations				Anions			$CaCO_3$ %
meq/L							
Ca^{++}	K^{+}	Na^{+}	Mg^{++}	Cl^{-}	HCO_3^{-}	$CO_3^{=}$	
498.25	34.02	1177.53	168.00	2291.00	3.55	-	7.39
254.00	17.71	652.82	90.00	1207.50	4.85	-	7.51

Table 2: Chemical analysis of water used for irrigation.

pH	E. Cw (dS/m)	Millie equivalent / liter						
		Cations				Anions		
		Ca^{++}	Mg^{++}	Na^{+}	K^{+}	$CO_3^{=}$	HCO_3^{-}	Cl^{-}
6.66	0.79	1.42	2.22	3.24	0.66	0.00	1.88	5.02

Seventy-five healthy trees, nearly uniform in shape, size and productivity, received the same horticultural practices were used in this experiment.

The present study was a factorial experiment with two factors. The first factor involved five levels of foliar application treatments. The second factor consisted of five levels of soil application treatments. The experiment was designed as a randomized complete block design with three replicates for each treatment and each replicate was represented by one tree.

Foliage measurements included the following characters: shoot length, shoot diameter, number of leaves/shoot were recorded in August of both seasons, Leaf area and leaf chlorophyll (a) and (b), total chlorophyll and carotenoids content as measured on Aug. 20th on 20 fully-expanded leaves per tree and sampled from the middle of shoots. Leaf area was recorded using a Cl203Area Meter (CID, Inc., USA), while a SPAD 502 chlorophyll meter (Minolta Corporation, Ramsey, N.J., USA) was used in recording chlorophyll readings.

Initial fruit set (%)

Number of tagged four shoots had flowers were labeled at full bloom, thereafter number of set fruitlets was recorded. Fruit set percentages were calculated at May, in the first and second seasons, as follows:

$$\text{Initial fruit set \%} = \frac{\text{No. of set fruitlets}}{\text{Total No. of flowers at full bloom}} \times 100$$

Number of fruits / tree, yield Kg / tree and yield ton / feddan

At harvest time at last week of July the number of fruits per each replicate was counted and reported then yield (kg) per tree and ton per feddan was estimated and recorded.

Fruit physical and chemical properties

Five pear fruits of each replicated at maturity stage were taken at harvest time on September during two seasons from each replicate for determination of the following physical and chemical properties. Fruit weight (g), fruit volume (ml), fruit firmness, fruit length (cm) fruit diameter (cm), fruit shape index (F.L. /F.D.) were determined by separating pulp from the peel and the juice is extracted from the pulp by centrifugation, fruit total soluble solids (T.S.S.) % was determined by Hand refract meter, total acidity percentage was determined in fruit juice according to (A.O.A.C., 1995), T.S.S./Acid ratio according to A.O.A.C. (2000). Total sugars (%), reducing sugars % and non- reducing sugars % were determined in fruit juice (100 nm juice) photo-metrically at 490 nm to the phenol method and using ethyl alcohol for 1 hour at 70^0C as described by Dubois *et al.,* (1956). Pulp content of vitamin C (mg/100g f. w.) according to A.O.A.C. (1990) were determined.

Chemical analysis was made on leaf samples to determine some mineral elements content. Samples were taken from intermediate position on current season shoots in August. Leaves were first washed several times with tap water; then with distilled water, dried at 70^oc, and finely ground. Samples, 0.5 g each, were digested using H_2SO_4-H_2O_2 as described by Cottenie (1980). Then, extracts were prepared for chemical analysis as described by Jackson (1973). Nitrogen was determined according to the modified Kjeldahl method as described by A.O.A.C. (1975). Phosphorus content was clorimetrically estimated according to Troug and Meyer (1939). Potassium was determined by the flame-photometer according to Jackson (1958). Piper (1950) using flame photometer according to Brown & Lilleland (1946). Calcium and magnesium were determined by titration against versant solution (Na EDTA) according to (Chapman and Pratt, 1961). Iron and Zinc, were determined by using the Atomic Absorption Spectrophotometer "GBC 932 AA". Sodium also was determined by using flame photometer (Brown and Lilleland, (1946). Chloride content was assessed according to the methods of

Higinbothan *et al.,* (1967). Proline content was then colorimetriaclly estimated at 520 nm according to Bates *et al.,* (1973).

The obtained data were statistically analysed according to Snedecor & Cochran (1990). Mean separation was calculated using L.S.D. values at 5 % level.

3. Results and Discussion

Data in table (3) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on shoot length and shoot diameter of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Shoot length

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree recorded highest significant values in both seasons. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic at 50 ml/tree gave highest shoot length in both seasons.

Shoot diameter

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values in both seasons. Concerning soil application treatments, humic acid at 25 and 50 ml/tree recorded highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic at 25 ml/tree gave highest shoot diameter in both seasons.

Data in table (4) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on number of leaves/shoot, leaf area of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Number of leaves/shoot

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree recorded highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with EM at 75 ml/tree had highest shoot length in both seasons.

Leaf area

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree recorded highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic at 25 and 50 ml/tree recorded highest shoot length than most of other treatments in both seasons.

Data in table (5) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on chlorophyll a, chlorophyll b of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Chlorophyll a and chlorophyll b

Regarding to foliar application treatments, citric acid at 500, 1000 ppm in chlorophyll a and 1000 ppm in chlorophyll b had highest significant values in both seasons. Concerning soil application treatments, there are insignificant differences among most of the concentrations of chlorophyll a, chlorophyll b in both seasons. The interaction between the two studied factors, the treatment of 1000 ppm citric acid with both of humic acid of 25 and 50 ml gave highest values of chlorophyll a and b in both seasons.

Data in table (6) show the effect some anti- salinity foliar application and soil application treatments and their interaction on total chlorophyll and carotenoids of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Table 3: Effect of some anti- salinity foliar application and soil application treatments and their interaction on shoot length and shoot diameter of Le-conte pear (*Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Shoot length (cm)						Shoot diameter (cm)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	48.07op	50.78m	51.73l	52.23kl	52.83h	51.13**E**	0.610k	0.740gh	0.750fg	0.770ef	0.790c-e	0.732**D**
Salicylic acid(SA) at 100ppm	48.73o	53.32j	54.84i	54.48i	56.83h	53.64**D**	0.700i	0.770ef	0.740gh	0.730gh	0.750fg	0.738**D**
Salicylic acid(SA) at 200ppm	47.55p	56.18h	57.53g	58.03g	57.68g	55.39**C**	0.660i	0.780de	0.770ef	0.800b-d	0.790c-e	0.760**C**
Citric acid(CA) at 500ppm	49.43n	58.93f	59.48i	60.08e	61.02d	57.79**B**	0.690i	0.770ef	0.800b-d	0.810bc	0.820b	0.778**B**
Citric acid(CA) at 1000ppm	50.18m	61.35d	62.04c	62.91b	64.83a	60.26**A**	0.72h	0.810bc	0.820b	0.840a	0.780de	0.794**A**
Mean	48.79**E**	56.11**D**	57.12**C**	57.55**B**	58.64**A**		0.676**C**	0.774**B**	0.776**B**	0.790**A**	0.786**A**	
Second season 2022												
Control	53.22q	55.93n	56.88m	57.38lm	57.98h	56.28**E**	0.640l	0.770gh	0.780g	0.800f	0.820de	0.762**D**
Salicylic acid(SA) at 100ppm	55.88p	58.47k	59.99j	59.63j	61.98h	58.79**D**	0.730j	0.800f	0.770gh	0.760hi	0.780g	0.768**D**
Salicylic acid(SA) at 200ppm	52.70q	61.33i	62.68g	63.18g	62.83g	60.54**C**	0.690k	0.810ef	0.800f	0.830cd	0.820de	0.790**C**
Citric acid(CA) at 500ppm	54.58o	64.08f	64.63ef	65.23e	66.17d	62.94**B**	0.720j	0.800f	0.830cd	0.840bc	0.850b	0.808**B**
Citric acid(CA) at 1000ppm	55.33n	66.50d	67.19c	68.06b	69.98a	65.41**A**	0.750i	0.840bc	0.850b	0.870a	0.810ef	0.824**A**
Mean	53.94**E**	61.26**D**	62.27**C**	62.70**B**	63.79**A**		0.706**C**	0.804**B**	0.806**B**	0.820**A**	0.816**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: effective microorganisms
H.A.: humic acid

Table 4: Effect of some anti- salinity foliar application and soil application treatments and their interaction on number of leaves/shoot, leaf area of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	No. of leaves/shoot						Leaf area (cm^2)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	13.00q	18.00l	19.00k	18.00l	19.00k	17.40**E**	21.90t	24.55p	25.65o	27.75l	28.55ij	25.68**D**
Salicylic acid(SA) at 100ppm	14.00p	21.00i	20.00j	22.00h	23.00e	20.00**D**	24.05qr	27.25m	28.35jk	29.05gh	28.15ij	27.37**C**
Salicylic acid(SA) at 200ppm	16.00n	25.00e	24.00f	23.00g	25.00e	22.60**C**	23.35s	26.85n	28.75hi	28.05kl	29.75f	27.35**C**
Citric acid(CA) at 500ppm	15.00o	26.00d	27.00c	25.00e	27.00c	24.00**B**	23.75r	30.15e	29.35g	29.95ef	30.55d	28.75**B**
Citric acid(CA) at 1000ppm	17.00m	28.00b	29.00a	27.00c	28.00b	25.80**A**	24.35pq	31.05c	31.25bc	31.55ab	31.80a	30.00**A**
Mean	15.00**E**	23.60**C**	23.80**B**	23.00**D**	24.40**A**		23.48**E**	27.97**D**	28.67**C**	29.27**B**	29.76**A**	
Second season 2022												
Control	15.00q	20.00l	21.00k	20.00l	21.00k	19.40**E**	22.55t	25.20p	26.30o	28.40l	29.20ij	26.33**D**
Salicylic acid(SA) at 100ppm	16.00p	23.00i	22.00j	24.00h	25.00g	22.00**D**	24.70qr	27.90n	29.00jk	29.70kl	28.80k	28.02**C**
Salicylic acid(SA) at 200ppm	18.00n	27.00e	26.00f	25.00g	27.00e	24.60**C**	24.00s	27.50n	29.40hi	28.70kl	30.40f	28.00**C**
Citric acid(CA) at 500ppm	17.00o	28.00d	29.00c	27.00e	29.00c	26.00**B**	24.40r	30.80e	30.00g	30.60ef	31.20d	29.40**B**
Citric acid(CA) at 1000ppm	19.00m	30.00b	31.00a	29.00c	30.00b	27.80**A**	25.00pq	31.70c	31.90bc	32.20ab	32.45a	30.65**A**
Mean	17.00**E**	25.60**C**	25.80**B**	25.00**D**	26.40**A**		24.13**E**	28.62**D**	29.32**C**	29.92**B**	30.41**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: effective microorganisms
H.A.: Humic acid

Table 5: Effect of some anti- salinity foliar application and soil application treatments and their interaction on chlorophyll a, chlorophyll b of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons

Foliar application treatments	Chlorophyll a (mg/100g.f.w)						Chlorophyll b (mg/100g.f.w)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	0.520l	0.660hi	0.700gh	0.720e-g	0.710f-h	0.662**D**	0.450n	0.590k	0.630j	0.650h-j	0.640ij	0.592**E**
Salicylic acid(SA) at 100ppm	0.540kl	0.730d-g	0.750b-g	0.740c-g	0.750b-g	0.702**C**	0.470n	0.660g-j	0.680e-h	0.670f-i	0.680e-h	0.632**D**
Salicylic acid(SA) at 200ppm	0.570kl	0.760a-f	0.770a-e	0.780a-d	0.790a-d	0.734**B**	0.500m	0.690d-g	0.700c-f	0.710b-e	0.720a-d	0.664**C**
Citric acid(CA) at 500ppm	0.590jk	0.800a-c	0.800a-c	0.810ab	0.800a-c	0.760**A**	0.520m	0.730a-c	0.730a-c	0.740ab	0.730a-c	0.690**B**
Citric acid(CA) at 1000ppm	0.630ij	0.790a-d	0.810ab	0.820a	0.820a	0.774**A**	0.560l	0.720a-d	0.740ab	0.750a	0.750a	0.704**A**
Mean	0.570**C**	0.748**B**	0.766A**B**	0.774**A**	0.774**A**		0.500**C**	0.678**B**	0.696**A**	0.704**A**	0.704**A**	
Second season 2022												
Control	0.550n	0.690k	0.730j	0.750h-j	0.740ij	0.692**D**	0.470o	0.610l	0.650k	0.670i-k	0.660jk	0.612**E**
Salicylic acid(SA) at 100ppm	0.570mn	0.760g-j	0.780e-h	0.770f-i	0.780e-h	0.732**C**	0.490o	0.680h-j	0.700f-h	0.690g-i	0.700f-h	0.652**D**
Salicylic acid(SA) at 200ppm	0.600lm	0.790d-g	0.800c-f	0.810b-e	0.820a-d	0.764**B**	0.520n	0.710e-g	0.720d-f	0.730c-e	0.740b-d	0.684**C**
Citricacid(CA) at 500ppm	0.620l	0.830a-c	0.830a-c	0.840ab	0.830a-c	0.790**A**	0.540n	0.750a-c	0.750a-c	0.760ab	0.750a-c	0.710**B**
Citric acid(CA) at 1000ppm	0.660k	0.820a-d	0.840ab	0.850a	0.850a	0.804**A**	0.580m	0.740b-d	0.760ab	0.770a	0.770a	0.724**A**
Mean	0.600**C**	0.772**B**	0.796**A**	0.804**A**	0.804**A**		0.520**C**	0.698**B**	0.716**A**	0.724**A**	0.724**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Table 6: Effect some anti- salinity foliar application and soil application treatments and their interaction on total chlorophyll and carotenoids of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Total chlorophyll (mg/100g.f.w)						Carotenoids (mg/100g.f.w)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	0.970n	1.250k	1.330j	1.370h-j	1.350ij	1.254**E**	0.470n	0.610ij	0.650hi	0.670f-h	0.660gh	0.612**D**
Salicylic acid(SA) at 100ppm	1.010n	1.390g-i	1.430e-g	1.410f-h	1.430e-g	1.334**D**	0.490mn	0.680e-h	0.700c-g	0.690d-h	0.700c-g	0.652**C**
Salicylic acid(SA) at 200ppm	1.070m	1.450d-f	1.470c-e	1.490b-d	1.510a-c	1.398**C**	0.520lm	0.710b-f	0.720a-e	0.730a-d	0.740a-d	0.684**B**
Citric acid(CA) at 500ppm	1.110m	1.530a-c	1.530a-c	1.550ab	1.530a-c	1.450**B**	0.540kl	0.750a-c	0.750a-c	0.760ab	0.750a-c	0.710**A**
Citric acid(CA) at 1000ppm	1.190l	1.510a-c	1.550ab	1.570a	1.570a	1.478**A**	0.580jk	0.740a-d	0.760ab	0.770a	0.770a	0.724**A**
Mean	1.070**C**	1.426**B**	1.462**A**	1.478**A**	1.478**A**		0.520**C**	0.698**B**	0.716A**B**	0.724**A**	0.724**A**	
Second season 2022												
Control	1.020m	1.300j	1.380i	1.420g-i	1.400hi	1.304**D**	0.490o	0.630jk	0.670ij	0.690a	0.680hi	0.632**D**
Salicylic acid(SA) at 100ppm	1.060lm	1.440f-i	1.480d-h	1.460e-i	1.480d-h	1.384**C**	0.510no	0.700f-i	0.720d-h	0.710e-i	0.720d-h	0.672**C**
Salicylic acid(SA) at 200ppm	1.120kl	1.500c-g	1.520b-f	1.540a-e	1.560a-d	1.448**B**	0.540mn	0.730c-g	0.740b-f	0.750a-e	0.760a-d	0.704**B**
Citric acid(CA) at 500ppm	1.160k	1.580a-c	1.580a-c	1.600ab	1.580a-c	1.500**A**	0.560lm	0.770a-c	0.770a-c	0.780ab	0.770a-c	0.730**A**
Citric acid(CA) at 1000ppm	1.240j	1.560a-d	1.600ab	1.620a	1.620a	1.528**A**	0.600kl	0.760a-d	0.780ab	0.790a	0.790a	0.744**A**
Mean	1.120**C**	1.476**B**	1.512**B**	1.528**A**	1.528**A**		0.540**C**	0.718**B**	0.736A**B**	0.744**A**	0.744**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Total chlorophyll

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values in both seasons. Concerning soil application treatments, humic acid at 25 and 50 ml/tree recorded highest significant values in both seasons. The interaction between the two studied factors, citric acid at 1000 ppm with EM at 25 and 50 ml recorded highest values of total chlorophyll in both the two studied seasons.

Carotenoids

Regarding to foliar application treatments, citric acid at 500 and 1000 ppm had highest significant values in both seasons. Concerning soil application treatments, humic acid at 25 and 50 ml/tree recorded highest values. The interaction between the two treatment of 1000 ppm citric acid with 25 and 50 ml with EM gave highest values in both the two studied seasons.

Data in table (7) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit set and number of fruits/tree of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Fruit set and Number of fruits/tree

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values fruit set and number of fruits/tree as both seasons. Concerning soil application treatments, humic acid at 25 and 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic at 50 ml/tree found highest fruit set and number of fruits/tree in both seasons.

Data in table (8) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on yield (kg/tree) and yield (Ton/fed.) of Le-conte pear trees *(Pyrus communis L.*) in new valley during 2021 & 2022 seasons.

Yield (kg/tree) and yield (Ton/feddan)

Regarding to foliar application treatments, citric acid at 500, 1000 ppm in yield (kg/tree) and yield (Ton/feddan) had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with EM at 50 ppm gave highest yield (kg/tree) and yield (Ton/feddan in both seasons.

Data in table (9) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit weight and fruit volume of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Fruit weight and fruit volume

Regarding to foliar application treatments, citric acid at 500 ppm of fruit weight and fruit volume had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with EM at 50 ppm found highest fruit weight and fruit volume in both seasons.

Data in table (10) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit length and fruit diameter of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Fruit length, fruit diameter

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values of fruit length and fruit diameter in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 25 and 50 ppm recorded highest fruit length and fruit diameter in both seasons.

Table 7: Effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit set and number of fruits/tree of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Fruit set (%)						No. of fruits/tree					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	15.75o	26.32l	27.81i	28.55gh	26.77k	25.04**E**	326.0u	353.0p	358.0o	362.0lm	351.0q	350.0**D**
Salicylic acid(SA) at 100ppm	25.84m	28.74gh	28.42h	29.25f	29.29f	28.31**C**	335.0t	362.0lm	360.0n	366.0i	370.0h	358.6**C**
Salicylic acid(SA) at 200ppm	24.22n	28.85g	29.20f	28.66gh	28.53gh	27.89**D**	339.0s	364.0jk	365.0u	363.0kl	361.0mn	358.4**C**
Citric acid(CA) at 500ppm	27.05k	29.38f	30.35e	30.08e	30.33e	29.44**B**	345.0r	371.0h	376.0f	373.0g	378.0e	368.6**B**
Citric acid(CA) at 1000ppm	27.38j	33.45d	34.25c	35.15b	37.55a	33.56**A**	350.0q	386.0d	391.0c	394.0b	400.0a	384.2**A**
Mean	24.05**E**	29.35**D**	30.01**C**	30.34**B**	30.49**A**		339.0**D**	367.2**C**	370.0**B**	371.6**A**	372.0**A**	
Second season 2022												
Control	17.65n	27.50l	28.60i	30.00f	27.85k	26.32**D**	332.0x	359.0r	364.0q	368.0n	357.0s	356.0**D**
Salicylic acid(SA) at 100ppm	26.65m	29.40hi	29.20i	30.05f	30.00f	29.06**C**	341.0w	368.0n	366.0p	372.0j	376.0i	364.6**C**
Salicylic acid(SA) at 200ppm	27.55l	29.50g-i	29.85f	29.55gh	29.45g-i	29.18**C**	345.0v	370.0l	371.0k	369.0m	367.0o	364.4**C**
Citric acid(CA) at 500ppm	27.95k	29.75fg	31.15e	30.90e	31.00e	30.15**B**	351.0u	377.0h	382.0f	379.0g	384.0e	374.6**B**
Citric acid(CA) at 1000ppm	28.10k	34.05d	34.95c	35.85b	38.45a	34.28**A**	356.0t	392.0d	396.0c	399.0b	402.0a	389.0**A**
Mean	25.58**D**	30.04**C**	30.75**B**	31.27**A**	31.35**A**		345.0**D**	373.2**C**	375.8**B**	377.4**A**	377.2**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Table 8: Effect of some anti- salinity foliar application and soil application treatments and their interaction on yield (kg/tree) and yield (Ton/fed.) of Le-conte pear trees (*Pyrus communis* L.) in new valley during 2021 & 2022 seasons.

Foliar application treatments	Yield (kg/tree)						Yield (Ton/fed.)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	35.99r	36.22r	49.61n	34.03s	52.70m	41.71**D**	6.05k	6.08k	8.33i	5.72k	8.85h	7.01**D**
Salicylic acid(SA) at 100ppm	42.14q	57.67k	54.49l	64.79h	58.44j	55.51**C**	7.08j	9.69g	9.15h	10.89e	9.82g	9.33**C**
Salicylic acid(SA) at 200ppm	48.56o	61.67i	71.13e	69.21f	66.39g	63.39**B**	8.16i	10.36f	11.95c	11.63cd	11.15de	10.65**B**
Citric acid(CA) at 500ppm	42.31q	69.95f	77.27c	74.51d	75.03d	67.81**A**	7.11j	11.75c	12.98b	12.52b	12.61b	11.39**A**
Citric acid(CA) at 1000ppm	43.91p	81.59b	65.23h	65.38h	82.84a	67.79**A**	7.38j	13.71a	10.96e	10.98e	13.92a	11.39**A**
Mean	42.58**D**	61.42**C**	53.55**B**	61.58**C**	67.08**A**		7.15**D**	10.32**C**	10.68**B**	10.35**C**	11.27**A**	
Second season 2022												
Control	37.20p	37.43p	51.04l	35.20q	54.19k	43.01**D**	6.25k	6.29k	8.57i	5.91k	9.10h	7.23**D**
Salicylic acid(SA) at 100ppm	43.46o	59.23i	56.00j	66.47g	60.00i	57.03**C**	7.30j	9.95g	9.41h	11.17e	10.08g	9.58**C**
Salicylic acid(SA) at 200ppm	49.98m	63.30h	72.91d	70.96e	68.10f	65.05**B**	8.40i	10.64f	12.25c	11.92cd	11.44de	10.9**B**
Citric acid(CA) at 500ppm	43.62o	71.70e	79.13b	76.34c	76.86c	69.53**A**	7.33j	12.05c	13.29b	12.82b	12.91b	11.68**A**
Citric acid(CA) at 1000ppm	45.25n	83.50a	66.72g	66.87g	81.13a	69.29**A**	7.60j	14.03a	11.21e	11.23e	14.13a	11.64**A**
Mean	43.90**D**	63.03**C**	65.16**B**	63.17**C**	68.66**A**		7.38**D**	10.59**C**	10.95**B**	10.61**C**	11.53**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Table 9: Effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit weight and fruit volume of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Fruit weight (gm)						Fruit volume (ml)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	110.4q	102.6r	138.6n	94.00s	150.1l	119.1**E**	115.7q	107.9r	143.8n	99.30s	155.4l	124.4**E**
Salicylic acid(SA) at 100ppm	125.8o	159.3k	151.4l	177.0h	157.9k	154.3**D**	131.1o	164.6k	156.6l	182.3h	163.2k	159.5**D**
Salicylic acid(SA) at 200ppm	143.2m	169.4i	194.9d	190.7e	183.9g	176.4**B**	148.5m	174.7i	200.1d	195.9e	189.2g	181.7**B**
Citric acid(CA) at 500ppm	122.6p	188.5f	205.5b	199.8c	198.5c	183.0**A**	127.9p	193.8f	210.8b	205.0c	203.8c	188.2**A**
Citric acid(CA) at 1000ppm	125.5o	211.4a	166.8j	165.9j	207.1b	175.3**C**	130.7o	216.6a	172.1j	171.2j	201.5d	178.4**C**
Mean	125.5**D**	166.2**C**	171.4**B**	165.5**C**	179.5**A**		130.8**D**	171.5**C**	176.7**C**	170.7**C**	182.6**A**	
Second season 2022												
Control	112.1r	104.3s	140.2o	95.7t	151.8m	120.8**E**	117.3q	109.5r	145.5n	100.9s	157.0l	126.0**E**
Salicylic acid(SA) at 100ppm	127.5p	161.0l	153.0m	178.7i	159.6l	155.9**D**	132.7o	166.2k	158.3l	183.9h	164.8k	161.2**D**
Salicylic acid(SA) at 200ppm	144.9n	171.1j	196.5e	192.3f	185.6h	178.1**B**	150.1m	176.3i	201.8d	197.6e	190.8g	183.3**B**
Citric acid(CA)at 500ppm	124.3q	190.2g	207.2c	201.4d	200.2d	184.6**A**	129.5p	195.4f	212.4b	206.7c	205.4c	189.9**A**
Citric acid(CA)at 1000ppm	127.1p	213.0a	168.5k	167.6k	209.3b	177.1**C**	132.4o	218.3a	173.7j	172.8j	214.0b	182.2**C**
Mean	127.2**D**	167.9**C**	173.1**B**	167.1**C**	181.3**A**		132.4**D**	173.1**C**	178.3**B**	172.4**C**	186.4**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Table 10: Effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit length and fruit diameter of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Fruit length (cm)						Fruit diameter (cm)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	6.19p	6.83m	7.07l	7.28k	7.50j	6.97**E**	5.32p	5.96m	6.20l	6.41k	6.63j	6.10**E**
Salicylic acid(SA) at 100ppm	6.27p	7.67ij	7.81i	7.89hi	8.08gh	7.54**D**	5.40p	6.80ij	6.94hi	7.02h	7.21g	6.67**D**
Salicylic acid(SA) at 200ppm	6.36op	8.21e-g	7.88hi	8.11fg	8.25d-g	7.76**D**	5.49op	7.34e-g	7.01h	7.24fg	7.38d-g	6.89**C**
Citric acid(CA) at 500ppm	6.54no	8.35de	8.19e-g	8.31d-g	8.33d-f	7.94**B**	5.67no	7.48de	7.32e-g	7.44d-f	7.46de	7.07**B**
Citric acid(CA) at 1000ppm	6.70mn	8.45cd	8.57bc	8.70ab	8.81a	8.25**A**	5.83mn	7.58cd	7.70bc	7.83ab	7.94a	7.38**A**
Mean	6.41**D**	7.90**C**	7.91**C**	8.06**B**	8.19**A**		5.54**D**	7.02**C**	7.03**C**	7.19**B**	7.32**A**	
Second season 2022												
Control	6.28q	6.92n	7.16m	7.37l	7.59k	7.06**E**	5.41n	6.05l	6.29k	6.50j	6.72i	6.19**E**
Salicylic acid(SA) at 100ppm	6.36q	6.76jk	7.90ij	7.98hi	8.17gh	7.63**D**	5.49n	6.89hi	7.03gh	7.11g	7.30f	6.76**D**
Salicylic acid(SA) at 200ppm	6.45pq	8.30e-g	7.97hi	8.20fg	8.34d-g	7.85**C**	5.58n	7.43ef	7.10g	7.33f	7.47ef	6.98**C**
Citric acid(CA) at 500ppm	6.63op	8.44de	8.28e-g	8.40d-f	8.42d-f	8.03**B**	5.76m	7.57de	7.41ef	7.53de	7.55de	7.16**B**
Citric acid(CA) at 1000ppm	6.79no	8.54cd	8.66bc	8.79ab	8.90a	8.34**A**	5.92lm	7.67cd	7.79bc	7.92ab	8.03a	7.47**A**
Mean	6.50**D**	7.98**C**	7.99**C**	8.15**B**	8.28**A**		5.63**D**	7.11**C**	7.12**C**	7.28**B**	7.41**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
M.A.: Humic acid

Data in table (11) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit shape index and fruit firmness of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Fruit shape index

Regarding to foliar application treatments, control had highest significant values in both seasons. Concerning soil application treatments, control gave highest significant values in both seasons. The interaction between the two studied factors, all factor application treatments with control of soil treatments recorded highest values in both seasons.

Fruit firmness

Regarding to foliar application treatments, citric acid at 1000 ppm for fruit firmness had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 50 ml gave highest fruit firmness in both seasons.

Data in table (12) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on TSS and acidity of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

TSS

Regarding to foliar application treatments, citric acid at 1000 ppm, TSS had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with EM at 75 ppm and humic acid at 25 and 50 ppm found highest TSS in both seasons.

Acidity

Regarding to foliar application treatments, citric acid at 1000 ppm, acidity had lowest significant values in both seasons. Concerning soil application treatments, humic acid at 25 ml/tree in first season and humic acid at 50 ml/tree in second season had lowest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid 25 ml in first season and humic acid at 50 ml in second season gave lowest values.

Data in table (13) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on TSS/acid ratio, total sugars of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

TSS/acid ratio and total sugars

Regarding to foliar application treatments, citric acid at 1000 ppm had highest significant values of TSS/acid ratio and total sugars in both seasons. Concerning soil application treatments, humic acid at 25 ml/tree in TSS/acid ratio at first season and humic acid at 50 ml/tree at TSS/acid ratio and total sugars in second season had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 25 ml in first season and with 50 ml in second season gave highest TSS/acid ratio and total sugars.

Data in table (14) show the effect of some anti- salinity foliar application soil application treatments and their interaction on reducing sugars and non-reducing sugars of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Reducing sugars and non-reducing sugars

Regarding to foliar application treatments, citric acid at 1000 ppm in Reducing sugars and non-reducing sugars had highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the highest significant values were obtained by citric acid at 1000 ppm with humic acid at 50 ml /tree in first season and with 25 ml/tree in second season.

Table 11: Effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit shape index and fruit firmness of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Fruit shape index						Fruit firmness L/inch^2					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	1.164a	1.146a-e	1.140b-f	1.136c-g	1.131d-h	1.143**A**	13.55s	15.02p	15.49o	16.10n	16.56m	15.34**E**
Salicylic acid(SA) at 100ppm	1.161a	1.128e-i	1.125f-i	1.124f-i	1.121g-i	1.132**B**	13.69rs	16.74lm	16.99l	17.32k	17.60j	16.47**D**
Salicylic acid(SA) at 200ppm	1.158ab	1.119g-i	1.124f-i	1.120g-i	1.118g-i	1.128**B**	13.93r	17.94i	18.15hi	18.41gh	18.59g	17.40**C**
Citric acid(CA) at 500ppm	1.153ac	1.116hi	1.119g-i	1.117g-i	1.117g-i	1.124**BC**	14.32q	18.87f	19.21e	19.40de	19.60cd	18.28**B**
Citric acid(CA) at 1000ppm	1.149a-d	1.115hi	1.113hi	1.111i	1.110i	1.120**C**	14.56q	19.69bc	19.82bc	19.92ab	20.18a	18.83**A**
Mean	1.157**A**	1.125**B**	1.124**B**	1.122**B**	1.119**B**		14.01**E**	17.65**D**	17.93**C**	18.23**B**	18.51**A**	
Second season 2022												
Control	1.161a	1.144a-e	1.138a-f	1.134a-g	1.129b-g	1.141**A**	13.78s	15.25o	15.72n	16.33m	16.79l	15.57**E**
Salicylic acid(SA) at 100ppm	1.158a	1.126c-g	1.124c-g	1.122d-g	1.119e-g	1.130**B**	13.92s	16.97l	17.22k	17.55j	17.83i	16.70**D**
Salicylic acid(SA) at 200ppm	1.156ab	1.117e-g	1.123d-g	1.119e-g	1.116e-g	1.126**BC**	14.16r	18.17h	18.38h	18.64g	18.82g	17.63**C**
Citric acid(CA) at 500ppm	1.151a-c	1.115fg	1.117e-g	1.116e-g	1.115fg	1.123**BC**	14.55q	19.10f	19.44e	19.63de	19.83cd	18.51**B**
Citric acid(CA) at 1000ppm	1.147a-d	1.113fg	1.112fg	1.110fg	1.108g	1.118**C**	14.79p	19.92bc	20.05bc	20.15b	20.41a	19.06**A**
Mean	1.155**A**	1.123**B**	1.123**B**	1.120**B**	1.118**B**		14.24**E**	17.88**D**	18.16**C**	18.46**B**	18.74**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Table 12: Effect of some anti- salinity foliar application and soil application treatments and their interaction on TSS and acidity of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	TSS (%)						Acidity (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	11.42s	12.53op	12.74no	12.90mn	13.06m	12.53**E**	0.341a	0.334a	0.336a	0.211g-j	0.331ab	0.311**A**
Salicylic acid(SA) at 100ppm	11.67r	13.36l	13.60kl	13.78jk	13.96j	13.27**D**	0.326ab	0.313a-c	0.304a-d	0.205h-j	0.298a-d	0.289**AB**
Salicylic acid(SA) at 200ppm	11.79qr	14.32i	14.55g-i	14.80e-g	14.84ef	14.06**C**	0.291a-e	0.284a-f	0.287a-f	0.200h-j	0.289a-f	0.270**BC**
Citric acid(CA) at 500ppm	12.01q	14.69f-h	14.46hi	14.96de	15.20cd	14.26**B**	0.283a-f	0.279a-g	0.271a-h	0.191ij	0.259b-i	0.257**C**
Citric acid(CA) at 1000ppm	12.29p	15.34bc	15.49ab	15.58ab	15.72a	14.88**A**	0.245c-j	0.239d-j	0.223e-j	0.183j	0.218f-j	0.222**D**
Mean	11.84**E**	14.05**D**	14.17**C**	14.40**B**	14.56**A**		0.297A	0.290A	0.284A	0.198B	0.279A	
Second season 2022												
Control	11.51q	12.62m	12.83lm	12.99kl	13.15k	12.62**E**	0.346a	0.339ab	0.341ab	0.336ab	0.216f-i	0.316**A**
Salicylic acid(SA) at 100ppm	11.76p	13.45j	13.69i	13.87hi	14.05h	13.36**D**	0.331ab	0.318a-c	0.309a-c	0.303a-d	0.210g-i	0.294**AB**
Salicylic acid(SA) at 200ppm	11.8op	14.41g	14.64fg	14.89de	14.83de	14.15**C**	0.296a-e	0.289a-f	0.292a-f	0.294a-e	0.205hi	0.275**BC**
Citric acid(CA)at500ppm	12.10o	14.78ef	14.55fg	15.05d	15.29c	14.35**B**	0.288a-f	0.284a-g	0.276a-h	0.264b-i	0.196i	0.262**C**
Citric acid(CA)at1000ppm	12.38n	15.43bc	15.58ab	15.67ab	15.81a	14.97**A**	0.250c-i	0.244c-i	0.228d-i	0.223e-i	0.188i	0.227**D**
Mean	11.93**E**	14.14**D**	14.26**C**	14.49**B**	14.65**A**		0.302**A**	0.295**A**	0.289**A**	0.284**A**	0.203**B**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
M.A.: Humic acid

Table 13: Effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit TSS/acid ratio and total sugars of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	TSS/acid ratio						Total sugars (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	33.49t	37.51s	37.92s	61.14h	39.46qr	41.90**E**	8.12q	8.96no	9.11mn	9.19l-n	9.33k-m	8.94**E**
Salicylic acid(SA)at100ppm	35.80	42.68p	44.74o	67.22f	46.85n	47.46**D**	8.57p	9.41kl	9.46jk	9.54jk	9.66ij	9.33**D**
Salicylic acid(SA)at200ppm	40.52q	50.42lm	50.70lm	74.00c	51.35l	53.40**C**	8.66p	9.82i	10.06h	10.23gh	10.39g	9.83**C**
Citric acid(CA)at500ppm	42.44p	52.65jk	53.36j	78.32b	58.69i	57.09**B**	8.73op	10.82f	10.96ef	11.11de	11.25d	10.57**B**
Citric acid(CA)at1000ppm	50.16l-m	64.18g	69.46e	85.14a	72.11d	68.21**A**	8.79op	11.33d	11.67c	12.03b	12.25a	11.21**A**
Mean	40.48**E**	49.49**D**	51.23**C**	73.16**A**	53.69**B**		8.57**E**	10.07**D**	10.25**C**	10.42**B**	10.58**A**	
Second season 2022												
Control	33.27s	37.23q	37.62q	38.66	60.88h	41.53**E**	8.31r	9.15op	9.30no	9.38mn	9.52lm	9.13**E**
Salicylic acid(SA)at100ppm	35.53r	42.30o	44.30mn	45.78m	66.90f	46.96**D**	8.76q	9.60l	9.65kl	9.73kl	9.85jk	9.52**D**
Salicylic acid(SA)at200ppm	40.14p	49.86l	50.14k	50.65k	72.83c	52.72**C**	8.85q	10.01g	10.25i	10.42hi	10.58h	10.02**C**
Citric acid(CA)at500ppm	42.01o	52.04j	52.72j	57.01i	78.01b	56.36**B**	8.92q	11.01g	11.15fg	11.30ef	11.44de	10.76**B**
Citric acid(CA)at1000ppm	49.52l	63.24g	68.33e	70.27d	84.10a	67.09**A**	8.98pq	11.52d	11.86c	12.22b	12.44a	11.40**A**
Mean	40.09**E**	48.93**D**	50.62**C**	52.47**B**	72.54**A**		8.76**E**	10.26**D**	10.44**C**	10.61**B**	10.77**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

Table 14: Effect of some anti- salinity foliar application soil application treatments and their interaction on fruit reducing sugars and non-reducing sugars of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Reducing sugars (%)						Non-reducing sugars (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	5.37q	6.39kl	6.53jk	6.66ij	6.83f-h	6.36**E**	2.75h	2.57jk	2.58jk	2.53jk	2.50jk	2.59**E**
Salicylic acid(SA)at100ppm	5.61p	6.91d-g	6.99c-f	6.33l	6.40kl	6.45**D**	2.96g	2.50jk	2.47k	3.21f	3.26f	2.88**D**
Salicylic acid(SA)at200ppm	5.83o	6.65ij	6.81g-i	6.97c-g	6.74hi	6.60**C**	2.83h	3.17f	3.25f	3.26f	3.65e	3.23**C**
Citric acid(CA)at500ppm	6.01n	6.36l	6.90e-h	7.01c-e	7.07b-d	6.67**B**	2.72hi	4.46c	4.06d	4.10d	4.18d	3.90**B**
Citric acid(CA)at1000ppm	6.18m	6.89e-h	7.12bc	7.20b	7.56a	6.99**A**	2.61ij	4.44c	4.55c	4.3b	4.69a	4.22**A**
Mean	5.80**D**	6.64**C**	6.87**AB**	6.83**B**	6.92**A**		2.77**D**	3.43**C**	3.38**C**	3.59**B**	3.66**A**	
Second season 2022												
Control	5.46q	6.48kl	6.62jk	6.75ij	6.92f-h	6.45**E**	2.85i	2.67jk	2.68jk	2.63jk	2.60jk	2.69**E**
Salicylic acid(SA)at100ppm	5.70p	7.00d-g	7.08cf	6.42lm	6.49kl	6.54**D**	3.06h	2.60jk	2.57k	3.31g	3.36g	2.98**D**
Salicylic acid(SA)at200ppm	5.92o	6.74ij	6.90g-i	7.06c-g	6.83hi	6.69**C**	2.93i	3.27g	3.35g	3.36g	3.75f	3.33**C**
Citric acid(CA)at500ppm	6.10n	6.45l	6.99e-h	7.10c-e	7.16b-d	6.76**B**	2.82i	4.56c	4.16e	4.20de	4.28d	4.00**B**
Citric acid(CA)at1000ppm	6.27m	6.98e-h	7.21bc	7.29b	7.65a	7.08**A**	2.71j	4.54c	4.65c	4.93a	4.79b	4.32**A**
Mean	5.89**D**	6.73**C**	6.96**AB**	6.92**B**	7.01**A**		2.87**D**	3.53**C**	3.48**C**	3.69**B**	3.76**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
M.A.: Humic acid

Data in table (15) Show the effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit vitamin(c) and leaf nitrogen percentage of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Vitamin(c)

Regarding to foliar application treatments, citric acid at 1000 ppm in vitamin(c), gave highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values in both seasons. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 50 ppm recorded highest fruit vitamin(c) in both seasons.

Nitrogen

Regarding to foliar application treatments, citric acid at 1000 ppm for fruit nitrogen percentage gave highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 50 ppm found highest leaf percentage nitrogen in both seasons.

Data in table (16) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf phosphor and potassium percentage of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Phosphor and Potassium

Regarding to foliar application treatments, citric acid at 1000 ppm in phosphor and potassium gave highest significant values in both seasons. Concerning soil application treatments, humic acid at 50 ml/tree had highest significant values in both seasons. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 50 ppm recorded highest leaf phosphor and potassium percentage in both seasons.

Data in table (17) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf calcium and manganese leaf percentage of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 season.

Calcium

Regarding to foliar application treatments, citric acid at 1000 ppm, Calcium had highest significant values in both seasons. Concerning soil application treatments, EM at 75 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of salicylic acid at 200 ppm with EM at 75 ml/tree had highest Calcium in both seasons.

Manganese

Regarding to foliar application treatments, highest significant values were found by salicylic at 200 ppm and citric acid at 500 and 1000 ppm. Concerning soil application treatments, all soil application treatment showed significant values than control. The interaction between the two studied factors, citric acid at 1000 ppm with humic acid at 50 ml/tree gave highest values in both seasons.

Data in table (18) Show the effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf iron and zinc of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Iron and Zinc

Regarding to foliar application treatments, citric acid at 1000 ppm, iron and zinc had highest significant values in both seasons. Concerning soil application treatment, humic acid at 50 ml/tree had highest significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 50 ppm gave highest leaf iron and zinc in both seasons.

Table 15: Effect of some anti- salinity foliar application and soil application treatments and their interaction on fruit vitamin(c), leaf nitrogen percentage of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Vitamin(c) (mg/100gF.W.)						N (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	1.76p	2.47m	2.55lm	2.63l	2.76k	2.43**E**	1.77k	1.83jk	1.94f-h	1.98e-g	1.93f-h	1.89**E**
Salicylic acid(SA) at 100ppm	2.04o	2.82i-k	2.47m	2.90h-j	2.80jk	2.69**D**	1.87ij	1.88h-j	1.98e-g	2.04de	2.05de	1.96**D**
Salicylic acid(SA) at 200ppm	2.10o	2.83i-k	2.90h-j	2.93g-i	2.98f-h	2.75**C**	1.88h-j	1.93f-h	1.99ef	2.07cd	2.07cd	1.99**C**
Citric acid(CA) at 500ppm	2.24n	3.02e-g	3.08ef	3.12de	3.20cd	2.93**B**	1.90h-j	2.00d-f	2.03de	2.05de	2.34a	2.06**B**
Citric acid(CA) at 1000ppm	2.32n	3.23b-d	3.30bc	3.34b	3.50a	3.14**A**	1.91g-i	2.26b	2.04de	2.12c	2.40a	2.15**A**
Mean	2.09**D**	2.87**C**	2.94**B**	2.98**B**	3.05**A**		1.87**D**	1.98**C**	2.00**C**	2.05**B**	2.16**A**	
Second season 2022												
Control	1.82p	2.53m	2.61lm	2.69l	2.82k	2.49**E**	1.88gh	1.95fg	1.82h	1.94fg	1.95fg	1.91**E**
Salicylic acid(SA) at 100ppm	2.10o	2.88i-k	2.93h-k	2.96h-j	2.86jk	2.75**D**	1.93fg	1.96f	1.99ef	1.99ef	2.09d	1.99**C**
Salicylic acid(SA) at 200ppm	2.16o	2.89i-k	2.96h-j	2.99g-i	3.04f-h	2.81**C**	1.92fg	2.04de	2.08d	2.11cd	2.09d	2.05**B**
Citric acid(CA) at 500ppm	2.30n	3.0e-g	3.14ef	3.18de	3.26cd	2.99**B**	2.06de	1.45i	2.12cd	2.05de	2.10d	1.95**D**
Citric acid(CA) at 1000ppm	2.38n	3.29b-d	3.36bc	3.40b	3.56a	3.20**A**	2.25b	2.31b	2.39a	2.18c	2.45a	2.32**A**
Mean	2.15**D**	2.93**C**	3.00**B**	3.04**B**	3.11**A**		2.01**C**	1.94**D**	2.08**B**	2.05**B**	2.14**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid
The optimum level of Nitrogen in pear tree leaves = 2.3 – 2.7 % Nitrogen (Van den Ende and Leece 1975).

Table 16: Effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf phosphor and potassium of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	P (%)						K (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	0.030i	0.100g	0.119e-g	0.118e-g	0.136c-e	0.101**E**	1.64r	1.98m	1.97m	2.01l	2.01l	1.92**D**
Salicylic acid(SA) at 100ppm	0.040hi	0.115fg	0.145e	0.142e	0.182c	0.125**D**	1.73q	2.09k	2.12ij	2.18h	2.16h	2.06**C**
Salicylic acid(SA) at 200ppm	0.060gh	0.123e-g	0.163d	0.160d	0.198c	0.141**C**	1.82p	2.14i	2.12ij	2.10jk	2.13i	2.06**C**
Citric acid(CA) at 500ppm	0.090g	0.135ef	0.178d	0.180c	0.213a	0.159**B**	1.90o	2.17h	2.20g	2.23f	2.25e	2.15**B**
Citric acid(CA) at 1000ppm	0.105fg	0.149e	0.196c	0.203bc	0.239a	0.178**A**	1.95n	2.28d	2.30c	2.36b	2.44a	2.27**A**
Mean	0.065**D**	0.124**C**	0.160**B**	0.161**B**	0.194**A**		1.81**E**	2.13**D**	2.14**C**	2.18**B**	2.20**A**	
Second season 2022												
Control	0.045l	0.115ij	0.134h	0.133h	0.151gh	0.116**E**	1.65s	1.99n	1.98n	2.02m	2.02m	1.93**D**
Salicylic acid(SA) at 100ppm	0.59kl	0.134h	0.164fg	0.161fg	0.201d	0.144**D**	1.74r	2.10l	2.13k	2.19h	2.17i	2.07**C**
Salicylic acid(SA) at 200ppm	0.83j	0.146gh	0.186ef	0.183ef	0.221c	0.164**C**	1.83q	2.15j	2.13k	2.11l	2.14jk	2.07**C**
Citric acid(CA) at 500ppm	0.116ij	0.161fg	0.204d	0.206d	0.239b	0.185**B**	1.91p	2.18hi	2.21g	2.24f	2.26e	2.16**B**
Citric acid(CA) at 1000ppm	0.134h	0.178ef	0.225cd	0.232c	0.268a	0.207**A**	1.96o	2.29d	2.31c	2.37b	2.45a	2.28**A**
Mean	0.087**D**	0.147**C**	0.183**B**	0.183**B**	0.216**A**		1.82**E**	2.14**D**	2.15**C**	2.19**B**	2.21**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: humic acid
The optimum level of phosphor and potassium in pear tree leaves = 0.14 – 0.20 % phosphor and 1.2 – 2.0 % potassium (Van den Ende and Leece 1975).

Table 17: Effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf calcium and manganese percentage of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 season.

Foliar application treatments	Ca (%)						Mg (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	1.005p	1.097k-n	1.110j-m	1.140i-l	1.160i-l	1.102**E**	0.106i	0.126e-i	0.130d-i	0.134c-i	0.135c-i	0.125**B**
Salicylic acid(SA) at 100ppm	1.019op	1.150i-l	1.170i-k	1.180ij	1.199i	1.144**D**	0.116hi	0.134c-i	0.140b-h	0.145a-g	0.146a-g	0.136**B**
Salicylic acid(SA) at 200ppm	1.033n-p	1.210i	2.219a	1.290h	1.310gh	1.412**B**	0.123f-i	0.151a-f	0.154a-e	0.155a-e	0.157a-d	0.148**A**
Citric acid(CA) at 500ppm	1.065m-p	1.350f-h	1.380fg	1.420ef	1.470e	1.337**C**	0.113hi	0.159a-c	0.162a-c	0.157a-d	0.159a-c	0.150**A**
Citric acid(CA) at 1000ppm	1.088l-o	1.550d	1.580cd	1.640c	1.730b	1.518**A**	0.118g-i	0.162a-c	0.162a-c	0.164ab	0.171a	0.155**A**
Mean	1.042**E**	1.271**D**	1.492**A**	1.334**C**	1.374**B**		0.115**B**	0.146**A**	0.150**A**	0.151**A**	0.154**A**	
Second season 2022												
Control	1.012o	1.104k-n	1.117j-m	1.147i-l	1.167i-k	1.109**E**	0.112k	0.132g-k	0.136f-j	0.140d-i	0.141d-i	0.132**C**
Salicylic acid(SA) at 100ppm	1.026o	1.157i-l	1.177ij	1.187ij	1.206i	1.151**D**	0.122i-k	0.140e-i	0.146c-h	0.151b-g	0.152b-g	0.142**B**
Salicylic acid(SA) at 200ppm	1.040no	1.217i	2.226a	1.297h	1.317h	1.419**B**	0.129h-k	0.157a-f	0.160a-e	0.161a-d	0.163a-c	0.154**A**
Citric acid(CA) at 500ppm	1.072m-o	1.357gh	1.387fg	1.427ef	1.477e	1.344**C**	0.119jk	0.165a-c	0.168ab	0.163a-c	0.165a-c	0.156**A**
Citric acid(CA) at 1000ppm	1.095l-n	1.557d	1.587cd	1.647c	1.737b	1.525**A**	0.124i-k	0.168ab	0.168ab	0.170ab	0.177a	0.161**A**
Mean	1.049**E**	1.278**D**	1.499**A**	1.341**C**	1.381**B**		0.121**B**	0.152**A**	0.156**A**	0.157**A**	0.160**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid
The optimum level of phosphor and potassium in pear tree leaves = 0.14 – 0.20 % phosphor and 1.2 – 2.0 % potassium (Van den Ende and Leece 1975).

Table 18: Effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf iron and zinc of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Fe (ppm)						Zn (ppm)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
						First season 2021						
Control	78.54u	81.43o-q	81.87n-p	81.05p-r	82.42no	81.06**E**	34.24q	37.13lm	37.57kl	36.75mn	38.12jk	36.76**E**
Salicylic acid(SA) at 100ppm	79.25tu	82.31no	82.76mn	83.40lm	84.70jk	82.48**D**	34.95pq	38.01jk	38.46ij	39.10i	40.40gh	38.18**D**
Salicylic acid(SA) at 200ppm	79.87st	85.47ij	84.27kl	85.64ij	86.30i	84.31**C**	35.57op	41.17fg	39.97h	40.09h	40.50gh	39.46**C**
Citric acid(CA) at 500ppm	80.31rs	87.34h	88.42g	89.47f	91.45e	87.40**B**	36.01no	41.54f	42.62e	43.92d	44.15d	41.65**B**
Citric acid(CA) at 1000ppm	80.84qr	93.98d	95.73c	97.23b	104.53a	94.46**A**	36.54mn	47.71c	48.23c	49.17b	50.58a	46.45**A**
Mean	79.76**E**	86.11**D**	86.61**C**	87.36**B**	89.88**A**		35.46**D**	41.11**C**	41.37**C**	41.80**B**	42.75**A**	
						Second season 2022						
Control	79.19u	82.0o-q	82.52n-p	81.70p-r	83.07n	81.71**E**	34.67q	37.56lm	38.00kl	37.18m-o	38.55j-l	37.19**E**
Salicylic acid(SA) at 100ppm	79.90tu	82.96no	83.41mn	84.0lm	85.35jk	83.13**D**	35.38pq	38.44jk	38.89i-k	39.53i	40.83g-i	38.61**D**
Salicylic acid(SA) at 200ppm	80.52st	86.12ij	84.92kl	86.29ij	86.95i	84.96**C**	36.00op	41.60fg	40.40h	40.52h	40.93gh	39.89**C**
Citric acid(CA) at 500ppm	80.96rs	87.99h	89.07g	90.12f	92.10e	88.05**B**	36.44no	41.97f	43.05e	44.35d	44.58d	42.08**B**
Citric acid(CA) at 1000ppm	81.49qr	94.63d	96.38c	97.88b	105.18a	95.11**A**	36.97mn	48.14c	48.66c	49.60b	51.01a	46.88**A**
Mean	80.41**E**	86.76**D**	87.26**C**	88.01**B**	90.53**A**		35.89**D**	41.54**C**	41.80**C**	42.23**B**	43.18**A**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid
The optimum level of iron and zinc in pear tree leaves = 60.0 – 100.0 ppm iron and 20.0 – 50.0 ppm zinc (Van den Ende and Leece 1975).

Data in table (19) Show the effect of some anti- salinity foliar application and soil application treatments on sodium, coloried and their interaction of Le-conte pear *(Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Sodium and chloride

Regarding to foliar application treatments, citric acid at 1000 ppm, sodium and chloride had lowest significant values in both seasons. Concerning soil application treatment humic acid at 50 ml/tree had lowest significant values. The interaction between the two studied factors, there are insignificant differences among most of the concentrations of sodium and chloride in both seasons.

Data in table (20) show the effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf proline of Le-conte pear *(Pyrus communis L.*) trees in new valley during 2021 & 2022 seasons.

Proline

Regarding to foliar application treatments, citric acid at 1000 ppm in proline had lowest significant values in both seasons. Concerning soil application treatment humic acid at 50 ml/tree had lowed significant values. The interaction between the two studied factors, the treatment of citric acid at 1000 ppm with humic acid at 25 and 50 ppm gave lowest proline in both seasons.

These observations are in harmony with those mentioned by many authors as Yan-Lin and Soon (2001), that Citric acid consider as one of non-enzymatic antioxidants which act to eliminate free radicals produced in plants under stress.

Erik *et al.* (2000), that humic acid applications increase in soil organic matter which is improves plant growth and crop production. Hafez (2003), found that the dry matter yield of barley plants increased with increasing the addition rate of humic acid from 450 to 900 mg/kg in soil. Vaughan, 1974; Cacco and Dell Agnolla, (1984); Russo and Berlyn, (1990) humic acid increasing cell membrane permeability, oxygen uptake, respiration, photosynthesis, phosphate uptake and root cell elongation of plant growth. Delfine *et al.,* (2005) Humic acids may stimulate shoot and root growth, and improve resistance to environmental stress in plant. Türkmen *et al.,* (2005) suggested that humic acid may promote much growth of pepper seedlings in salty condition. Asık *et al.,* (2009) use of humic substances for removing negative effects of elements in toxic quantities, and effects on plant growth were studied.

Briefly, 'Le-Conte' pear cultivate grown under salinity stress soil condition gave with citric acid humic acid the best results of growth, yield and fruit quality.

4. Conclusion

Finally, spraying with citric acid treatment at 1000 ppm with humic acid soil application at 50 ml/tree could be recommended as the most appropriate treatment for decrease the negative effect of salinity on fruit quality of 'Le-Conte' pear were studied under salinity stress conditions, where improved natural and chemical properties of fruits. On the other side, reduced fruit total acidity content. This treatment was proved to be the most efficient in enhancing, the yield and fruit quality of cultivar had been studied.

Table 19: Effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf sodium and chloride of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Na (%)						Cl (%)					
	Control	Soil application				Mean	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50			EM50	EM75	H.A. 25	H.A. 50	
First season 2021												
Control	0.183a	0.148cd	0.143c-e	0.134d-f	0.119f-h	0.145**A**	0.596a	0.561cd	0.556c-e	0.547d-f	0.532f-h	0.558**A**
Salicylic acid(SA) at 100ppm	0.173ab	0.119f-h	0.123e-g	0.113f-i	0.106g-j	0.127**B**	0.586ab	0.532f-h	0.536e-g	0.526f-i	0.519g-j	0.540**B**
Salicylic acid(SA) at 200ppm	0.164a-c	0.102g-j	0.098h-k	0.097h-l	0.092i-l	0.111**C**	0.577a-c	0.515g-k	0.511h-l	0.510h-l	0.505i-l	0.524**C**
Citric acid(CA) at 500ppm	0.158bc	0.085j-m	0.079k-n	0.075l-n	0.067m-o	0.093**D**	0.571bc	0.498j-m	0.492k-n	0.488l-o	0.480m-o	0.506**D**
Citric acid(CA) at 1000ppm	0.154b-d	0.077k-n	0.065m-o	0.057no	0.053o	0.081**E**	0.567b-d	0.490l-n	0.478m-o	0.470no	0.466o	0.494**E**
Mean	0.166**A**	0.106**B**	0.102**BC**	0.095**CD**	0.087**D**		0.579**A**	0.519**B**	0.515**BC**	0.508**CD**	0.500**D**	
Second season 2022												
Control	0.198a	0.163c-e	0.158de	0.149ef	0.134f-h	0.160**A**	0.611a	0.576cd	0.571c-e	0.562d-f	0.547f-h	0.573**A**
Salicylic acid(SA) at 100ppm	0.188ab	0.134f-h	0.138fg	0.128g-i	0.121g-j	0.142**B**	0.601ab	0.547f-h	0.551e-g	0.541f-i	0.534g-j	0.555**B**
Salicylic acid(SA) at 200ppm	0.179bc	0.117h-k	0.113i-l	0.112i-l	0.107j-m	0.126**C**	0.592a-c	0.530g-j	0.526h-l	0.525h-l	0.520i-l	0.539**C**
Citric acid(CA) at 500ppm	0.173b-d	0.100k-n	0.094l-n	0.090m-o	0.082n-p	0.1088**D**	0.586bc	0.513j-n	0.507k-n	0.503l-n	0.495m-o	0.521**D**
Citric acid(CA) at 1000ppm	0.169b-d	0.092m-o	0.080n-p	0.072op	0.068p	0.096**E**	0.582b-d	0.505k-n	0.493m-o	0.485no	0.481o	0.509**E**
Mean	0.181**A**	0.121**B**	0.117**BC**	0.110**CD**	0.102**D**		0.594**A**	0.534**B**	0.530**BC**	0.523**CD**	0.515**D**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid
The optimum level of sodium and color in pear tree leaves 0.01 % sodium and 0.05 % color (Van den Ende and Leece 1975).

Table 20: Effect of some anti- salinity foliar application and soil application treatments and their interaction on leaf proline of Le-conte pear (*Pyrus communis* L.) trees in new valley during 2021 & 2022 seasons.

Foliar application treatments	Proline					
	Control	Soil application				Mean
		EM50	EM75	H.A. 25	H.A. 50	
		First season 2021				
Control	2.647a	1.421e	1.416ef	1.399fg	1.384g	1.653**A**
Salicylic acid(SA) at 100ppm	1.842b	1.276h	1.260hi	1.250i	1.243i	1.374**B**
Salicylic acid(SA) at 200ppm	1.813c	1.117j	1.113j	0.964k	0.959kl	1.193**C**
Citric acid(CA) at 500ppm	1.598d	0.952kl	0.946kl	0.942l	0.844m	1.056**D**
Citric acid(CA) at 1000ppm	1.592d	0.854m	0.842m	0.820n	0.816n	0.985**E**
Mean	1.898**A**	1.124**B**	1.115**C**	1.075**D**	1.049**E**	
		Second season 2022				
Control	2.662a	1.436e	1.431ef	1.414fg	1.399g	1.668**A**
Salicylic acid(SA) at 100ppm	1.857b	1.291h	1.275hi	1.265i	1.258i	1.389**B**
Salicylic acid(SA) at 200ppm	1.828c	1.132j	1.128j	0.979k	0.974kl	1.208**C**
Citric acid(CA) at 500ppm	1.613d	0.967kl	0.961kl	0.957l	0.859m	1.071**D**
Citric acid(CA) at 1000ppm	1.607d	0.869m	0.857m	0.835n	0.831n	1.000**E**
Mean	1.913**A**	1.139**B**	1.130**C**	1.090**D**	1.064**E**	

Means of each row, column or interaction having the same letter (s) are insignificantly different at 5% level.
E.M.: Effective microorganisms
H.A.: Humic acid

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