Effect of Nano and Mineral NPK in Leaves Contact of Element of Pear

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Abstract:

An experiment during the two seasons 2019,2020.The experiment was conducted according to Split Plot Design by two factors, the first was addition Nano NPK with five levels (control, addition 7.5 g.plant-1 , addition 15 g.plant-1 , spray 1 g.L-1 , spray 2 g.L-1) symbolized (N0,N1,N2,N3,N4) respectively, and the second factor was four levels of Un Nano (mineral) NPK which were (control, 50 g.plant-1, 100 g.plant-1 , 50 g.plant-1+1.5 g.L-1) symbolized (A0,A1,A2,A3) respectively. Result showed that N3 increased leaves content of K, Fe, Mn, in both seasons and Zn in first season, N4 increased leaves content of N, P, and Zn in second season. Mineral NPK A3 treatment increased N, K, Fe and Zn in both season. A2 treatment increased Mn and P in both seasons.

Key Words: pear, Nano NPK, macro elements, microelements.

Introduction:

Pear (Pyrus Communis L.) back to Rosacea from deciduous fruit, It is economical important to human, it contain sugar, organic acid, portions, vitamins and some of nutrients. Its source from cupper, manganese, potassium, iron, magnesium, vit. C , K and E. It used from medical to processing blood pressure, arteriosclerosis and heart disease, kidneys and liver (Al-Nuamey, 2010).

Nano fertilizers release nitrogen, phosphorous, potassium elements while absorbed by the crops, it works to rid the plant of toxic elements by throwing it into soil, water and air by analyzing them with crops some of them interact with soil nutrients and microorganisms in the air (DeRosa et al., 2010). The issue of harmony between those whose who are freed from any fertilizer formula, plant requirement and stage of growth remains the goal of nutritionists, soil fertility and fertilizer techniques seek to achieve in order to achieve higher absorption efficiency, cost and less environmental pollution (Ali and Al-Juthary, 2017). That the lack of elements, whether macro and micro elements causes the deterioration of the plant growth, soil and what it contains is an important and determinant factor for growth and production (El-Khawaga, 2007).

Mustafa and et al (2018) found the addition of Nano NPK to the fig seedlings C.V "Sultani" resulated in significant increase in the N, P and K content of the leaves at a concentration of 300 mg.kg-1. Hagag and et al (2018) also confirmed that adding NPK Nano fertilizer to

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olive trees C.V "Kalamat" at a concentration 0.2% increased N,P and K content of leaves. Abou-Grah and et al (2018) founds that adding mineral NPK to three varieties of plum trees increased the content of the leaves of N, P, K, Fe, Mn and Zn,. Hagagg et al (2018) also sprayed and added mineral NPK to the pomegranate seedling, when add to soil at 5 g.L-1 concentration it increase N, P and K, while foliar application with same concentreation increased the Fe, Mn and Zn content of the leaves. According to the above, the idea of this study came with the aim of knowledge of leaves content from some elements and determine the optimal concentration for spraying and addition of NPK fertilizers.

Material And Methods:

A factorial experiment was carry out by split-plot design with two factors, one of the important is the method of adding NPK mineral fertilizer to the four main plots. The second more important is the Nano NPK fertilizer with five secondary plots, so there is an experiment consisting of (4*5) so the total number of treatment is 20 for three replications with to saplings, total number of saplings will be 120. The results were analyze statistically using the Genstate program, the average were compare using the L.S.D test at 5% probability level. Spraying and Addition were performed in the early morning and sunset by four sprinkles predates 1/4, 15/4, 1/5, 15/5 in 2019, 2020. while ensuring the saplings had reached complete wetting.

Results And Discussion:

Results of the table (1) showed that the Nano NPK had a significant effect on the nitrogen content in leaves as a treatment N4 in both seasons in respectively. In addition, the mineral NPK had significant effects as A3 treatment in both seasons in respectively. The interaction between factors in A3N3 treatment is significant in both seasons about control treatment A0N0. Results of the table (2) showed that the Nano NPK had a significant effect on the phosphor content in leaves as a treatment N4 in both seasons in respectively. The mineral NPK had significant effects as A2 treatment in both seasons in respectively. The interaction between factors in A1N4 treatment is significant in both seasons about control treatment A0N0. Results of the table (3) showed that the Nano NPK had a significant effect on the potassium content in leaves as a treatment N3 in both seasons in respectively. The mineral NPK had significant effects as A3 treatment in both seasons in respectively. The interaction between factors in A3N2 treatment is significant in both seasons about control treatment A0N0. Results of the table (4) showed that the Nano NPK had a significant effect on the iron content in leaves as a treatment N3 in both seasons in respectively.

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The mineral NPK had significant effects as A3 treatment in both seasons in respectively. The interaction between factors in A3N3 treatment is significant in both seasons about control treatment A0N0. Results of the table (5) showed that the Nano NPK had a significant effect on the manganese content in leaves as a treatment N3 in both seasons in respectively. The mineral NPK had significant effects as A2 treatment in both seasons in respectively. The interaction between factors in A3N3 treatment is significant in both seasons about control treatment A0N0. Results of the table (6) showed that the Nano NPK had a significant effect on the zinc content in leaves as a treatment N3 in first season, N4 in second season. The mineral NPK had significant effects as A3 treatment in both seasons in respectively. The interaction between factors in A1N4 treatment is significant in first season and A3N4 in second season about control treatment A0N0.

Table 1. Effect of Nano and mineral NPK on the rate of nitrogen in leaves.(%)

	Season 1						Season 2					
Treatments	N0	N1	N2	N3	N4	A Average	N0	N1	N2	N3	N4	A Average
A_0	1.53	2.42	2.62	2.35	2.66	2.31	1.99	2.39	2.34	2.40	2.53	2.33
A_1	2.57	2.16	2.77	2.77	2.82	2.62	2.32	2.35	2.44	2.44	2.53	2.42
A_2	2.76	2.39	2.80	2.89	3.04	2.77	2.45	2.54	2.62	2.51	2.71	2.57
A_3	2.55	2.82	3.04	3.25	2.98	2.93	2.43	2.34	2.43	3.02	2.71	2.59
L.S.D 5%	0.495					0.274	0.228					0.124
Average N	2.35	2.45	2.81	2.81	2.87	LSD 5% N 0.247	2.30	2.40	2.46	2.59	2.62	LSD 5% N 0.114

Table 2. Effect of Nano and mineral NPK on the rate of phosphor in leaves.(%)

	Season 1						Season 2					
Treatments	N0	N1	N2	N3	N4	A Average	N0	N1	N2	N3	N4	A Average
A_0	0.213	0.246	0.276	0.300	0.280	0.263	0.293	0.290	0.293	0.303	0.300	0.276
A_1	0.300	0.350	0.263	0.310	0.366	0.318	0.326	0.316	0.326	0.296	0.330	0.310
A_2	0.273	0.343	0.373	0.333	0.330	0.330	0.310	0.300	0.310	0.306	0.320	0.313
A_3	0.266	0.303	0.300	0.353	0.360	0.316	0.193	0.310	0.310	0.316	0.323	0.312
L.S.D 5%	0.056					0.038	0.028					0.015
Average N	0.263	0.310	0.303	0.324	0.334	LSD 5% N 0.026	0.275	0.304	0.310	0.305	0.318	LSD 5% N 0.014

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Table 3. Effect of Nano and mineral NPK on the rate of potassium in leaves.(%)

	Season 1						Season 2					
Treatments	N0	N1	N2	N3	N4	A Average	N0	N1	N2	N3	N4	A Average
A_0	0.807	1.050	1.087	1.157	1.130	1.046	0.857	1.317	1.573	1.343	1.493	1.317
A_1	1.173	1.040	1.007	1.280	1.047	1.109	1.440	1.420	1.237	1.677	1.397	1.434
A_2	1.033	1.233	1.210	1.097	1.210	1.157	1.397	1.577	1.290	1.353	1.427	1.409
A_3	1.097	1.180	1.403	1.213	1.210	1.221	1.363	1.553	1.727	1.653	1.567	1.573
L.S.D 5%	0.478					0.046	0.223					0.121
Average N	1.028	1.126	1.177	1.187	1.149	LSD 5% N 0.043	1.264	1.467	1.457	1.507	1.471	LSD 5% N 0.118

Table 4. Effect of Nano and mineral NPK on the iron continent in leaves (mg.kg-1).

	Season 1						Season 2					
Treatments	N0	N1	N2	N3	N4	A Average	N0	N1	N2	N3	N4	A Average
A_0	197.3	273.0	236.3	265.7	254.0	245.3	203.0	239.3	288.0	215.0	281.3	245.3
A_1	280.7	235.0	279.0	281.0	257.7	266.7	300.0	334.0	214.3	304.0	227.7	276.0
A_2	253.7	291.0	268.3	283.0	280.3	275.3	211.7	257.3	221.0	322.7	314.7	265.5
A_3	282.7	281.0	297.7	360.3	341.3	312.6	279.3	355.0	340.7	375.7	362.0	342.5
L.S.D 5%	23.64					12.43	24.56					14.67
Average N	253.6	270.0	270.3	297.5	283.3	LSD 5% N 12.06	248.5	296.4	266.0	304.3	296.4	LSD 5% N 11.98

Table 5. Effect of Nano and mineral NPK on the manganese continent in leaves (mg.kg-1).

	Season 1						Season 2					
Treatments	N0	N1	N2	N3	N4	A Average	N0	N1	N2	N3	N4	A Average
A_0	20.67	41.00	34.33	44.67	43.33	36.80	34.67	44.00	42.67	44.33	47.33	42.60
A_1	44.33	42.00	40.00	40.67	42.00	41.80	44.67	50.67	50.67	44.67	47.00	47.53
A_2	44.33	43.33	46.33	42.33	38.33	42.93	47.33	48.33	46.33	50.67	47.33	48.00
A_3	32.33	44.00	40.67	50.33	43.33	42.13	44.67	46.67	46.67	51.33	48.67	47.60
L.S.D 5%	5.002					3.864	4.377					2.540
Average N	35.42	42.58	40.33	44.50	41.75	LSD 5% N 2.100	42.83	47.42	46.58	47.75	47.58	LSD 5% N 2.156

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Table 6. Effect of Nano and mineral NPK on the zinc continent in leaves (mg.kg-1).

	Season 1						Season 2					
Treatments	N0	N1	N2	N3	N4	A Average	N0	N1	N2	N3	N4	A Average
A_0	109.1	138.3	137.3	140.0	138.0	132.5	130.3	267.6	217.0	289.0	260.0	232.8
A_1	140.6	142.3	140.3	152.3	143.6	143.8	240.0	202.0	274.3	202.3	292.0	242.1
A_2	140.0	143.3	134.3	143.0	141.3	140.4	256.6	264.6	283.3	215.6	214.3	246.9
A_3	142.6	141.6	149.3	140.0	151.6	145.0	220.6	284.0	221.0	276.3	271.0	254.6
L.S.D 5%	8.42					4.59	11.02					5.68
Average N	143.6	143.8	140.3	141.4	133.1	LSD 5% N 4.22	211.9	254.5	248.9	245.8	259.3	LSD 5% N 5.60

Conclusion:

Nanoparticles stimulate the development of the root zone, allowing the plant to absorb water and transfer them to other places such as leaves (Uarrota, 2010). And with this, we can find out the reason for increasing the content of leaving from elements, it may also be due to the fact that the addition of macro elements had led to an increase in the area of absorbable surfaces, which enhances the fixation of nutrients (Ehiagiator at el.,2011). The readiness of the elements increases when fertilizers containing N, P, K added, so their content in the leaves increases due to their role in increasing the rate of the biological activities in which the compounds of these elements participate. as N and P form compounds essential for photosynthesis and respiration, potassium helps form enzymes, which increases the readiness of these element in the leaf. Which may have led to an increase in the leaves content of the elements.

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