



THE EFFECT OF COMPOST NP AND SALICYLIC ACID SPRAY FOR QUANTITY AND QUALITY OF LUXURY VARIETY GRAPES (*VITIS VINIFERA* L.)

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Abstract

The research was conducted in one of the private orchards in the province of Babel, Al-Seahe region for the year 2018, on the grape plant, a luxury variety, as it was fertilized with the compound fertilizer NP (18:18), as four levels were added (0, 2.5, 5, 7.5) kg/seedlings, and the second factor is spraying with salicylic acid in concentrations (0, 75, 150) mg/l, and the co-treatments between them in improving the characteristics of growth and yield at maturity. The results indicated that there is a direct effect of fertilization operations, as individual treatment A2 exceeded other levels, and individual treatment B2 exceeded acid spraying on the rest of the levels, but with a lesser degree than ground fertilization. As for when overlapping between factors, the joint treatment gave A2B2 the best results, and outperformed the single treatment by giving it. The highest value and all the attributes studied, whether it is an quantitative or quality.

Keywords: compost NP, salicylic acid, grapes, luxury variety *Vitis vinifera* L.

Introduction

The *Vitis vinifera* L. grape belongs to the family Vitaceae blueberry which is one of the main fruits in Iraq and the world, as it occupies the first rank in the world in the spread and production (Hassan and Salman, 1989) and shows the economic importance of the fruits of grapes in Iraq through the length of consumption of fresh grapes, which starts from June to the end of November (Hassan and Salman, 1989 (As the area planted with grapes in the world is estimated at (7,586,600) hectares, and its total production is 85,719,418 tons). In Iraq, the total production amounted to about (226,718) tons of the total number of vines in the amount of (10,421,725) karma. (Central Bureau of Statistics, 2011) Al-Kamaly types This is a perfect variety of good grape varieties. For conical shape, large size, grains, oval, elongated, large size, pinkish-violet color, at full ripeness, with (2-4) seeds, and flesh pulp of a well-knit nibble (Al-Saeedi, 2000).

Grapes have many medical and therapeutic benefits, as they are an integrated food because of the sugars, acids, proteins and fiber content in their grains, in addition to being a foodstuff used as a stimulant for brain cells, heart muscles, and tonic for the liver and kidneys, and reduces the incidence of stomach, intestinal and urinary system diseases (Jamal Al-Din, 2010). Raising the production of grape vine and improving the quantitative and qualitative characteristics of the fruits through improving soil and crop service operations and using mineral nutrients that support and support the plant that is characterized by the large size of karma and the large leafy area that requires a lot of fertilizer that follows B has an important role in increasing the yield and improving the qualitative and quantitative characteristics of the fruits (Alakam, 2016). To achieve that nutrition and supply the plant with what it needs, attention must be paid to nitrogenous fertilizers and phosphates, knowing that nitrogen is the essential component of amino acids, so it is considered one of the essential nutrients for plants in general because of the effective role in activating most indicators Growth (FAO, 2008).

Also, the phosphorous component has a fundamental role in plant growth and includes the construction of membranes and the synthesis of substances important for the cell and its role in photosynthesis, respiration and other vital processes (Al-Naimi, 2009), as it was found (Hamoudi and Others, 2013) that nitrogen and phosphate fertilization gave good results for indicators The growth and chemical content of leaves in grape seedlings as between (Al-Akkam and others, 2016) that the addition of chemical fertilizers to aluminum bilateral phosphate DAP has a significant impact on improving the characteristics of vegetative growth and the leaf content of chlorophyll, nitrogen and phosphorus. (Mousawi, 2010) confirmed that adding urea fertilizer to grape vine may be Significantly affected most of the school traits. It has been observed (Al-Araji, 2006) that the effect of nitrogen and phosphate fertilization has significantly affected all vegetative growth characteristics under study.

The other factor is salicylic acid, an organic aromatic acid that is built or made from the amino acid Phenylalanine in the form of crystals of a pale color. It is found in plants and has many roles in plant growth, development, and increase in the efficiency of photosynthesis, transpiration, and absorption and transport of ions (Peter, 2006).

Materials and Methods

This study was conducted in one of the private orchards in the province of Babel, the tourist region for the year 2018, on grape vines, a perfect variety. Also, plants were selected at the age of 12 years, planted in parallel lines with dimensions (3 * 4), and breeders on locally made wire lunar satellites. 36 vines were selected from these plants. They were the same as possible in the diameter of the trunk and the bronchioles, their length and number, the number of tufted corners in them, and the eyes on the treads. Also, all modern growths were removed from the eyes of old wood, carcinomas and water branches whenever they appeared and unified all the service operations for the transactions to study them after conducting pruning on trees leaving 84 eyes for one vine distributed on seven reeds, each containing 12 eyes (Alwan, 1986) With seven regenerative cisterns left with two

eyes for each cistern, manure was added to N.P. To the soil which contains (46)% phosphorous and (17)% nitrogen at three levels (zero, 2.5, 5, 7.5) g/seedlings-1 symbol having symbols (A0, A1, A2 and A3) by making a small groove for depth 1 to 2 cm and is 2 to 3 cm away from the stem of the tree and returned the soil over the compost, then watered and the necessary service operations continued until the end of the season, as the trees were sprayed with salicylic acid with a concentration of (zero, 75, 150) mg/l symbolized with the symbol (B0, B1 and B2) when spraying By manual sprinkler until completely wet with the addition of the diffuser for the purpose of increasing surface tension. Facilitating the absorption process of plant tissue for foliar fertilizer (Al-Sahaf, 1989).

Table 1 : Showed the results of physicals and chemicals analyzes of field soil samples.

Property	Unit	Value
Sand	gm.kgm	308
Silt		323
Clay		365
Texture class		CLL
Bulk density	mgm.m ³	1.39
Water content at 33 kba		0.32
Water content at 1500 kba		0.13
Organic matter	gm.kgm	4.1
ECe	ds.m	4.1
Ph		7.6

School Attributes:

First: quantitative traits.

Average cluster weight was calculated by dividing the quotient/number of clusters for each vine. Number of clusters/generosity.

Second: qualitative qualities.

Percentage of total dissolved solids (T.S.S.) included measured by Hand Refractometer (A.O.A.C., 1970)

As for the percentage of total acidity (TA), it was measured according to the method (Ranganna, 1977).

Results and Discussion

The quantitative characteristics of the quotient.

The results of Table (1) indicate that the individual parameters of ground fertilizer and organic acid and the interference between them led to changes in the number of

clusters and the average weight of the cluster. In the number of clusters in grapevine, we find that they have increased to (50) clusters in treatment A2 compared to the comparison treatment A0 Which gave (37) clusters, but in spraying with amino acid, we find that the highest results were at the highest level of spray levels B2, when it reached (40) clusters, but when overlapping between the factors, we find that they gave the best results. Obtained if it reached (54) Clustered when treating A2B2, as well as with regard to the average weight of contracts, we find an increase in fertilization except Satisfied the cluster weight increased to 840 g compared to B (643 g) for coefficients A2 and A0 respectively, and when the single treatment sprayed with organic acid the best coefficients were B2 compared to coefficient B0 which gave (690 and 643) g respectively. Factors The treatment A2B2 was the best, it recorded (950) grams, and it is the best among all treatments, while the fourth level of fertilization did not rise to the required level of results. The reason for increasing the nutrient concentration in the soil is due to the increase in salinity, as well as the competition process between the nutrients inside the soil, which affects the mechanism of nutrient absorption from the soil and competition among them, which negatively affected the productivity of the plant, and this will be taken up in another research to find the chemical and physical causes affecting The production negatively affected this level of fertilization.

The observed superiority may be due to the direct effect of nitrogen. Because it is one of the necessary elements of most of the vital processes that take place inside the plant, as it enters into the synthesis of amino acids, which in turn forms the oxine that promotes the increase in cell divisions and their amplitude, which increases the growth of the plant (Al-Yaqoubi, 1985). Leads to activating the process of photosynthesis (Mohamed, 1985 and Abu Dahi, 1988). Also, phosphate fertilization works to prepare phosphorous, which in turn is one of the essential elements for plant growth that enters the processes of building cell membranes. It also contributes to the formation of ATP, phospholids and coenzyme. Photosynthesis Respiration and growth (Ali, 2012). These motives came identical to previous studies confirmed by (the alliance, 2005 and Al-Saeedi, 2007 and Al-Saeedi, 2010) as they are consistent with what it said (Hammoud *et al.*, 2013), as they indicated that the increase in nitrogenous and phosphate fertilizers resulted in an increase in the number of clusters and the weight of the cluster in Grape trees.

Table 2: Effect of different compound fertilizer N.P and different spraying salicylic acid

N.P.	Salicylic acid	Cluster weight	number of clusters	T.S.S.	Total acidity percentage	Anthocyanin tincture
A ₀	B ₀	643	37	13.7	0.731	0.9
	B ₁	678	37	13.9	0.728	1.2
	B ₂	695	40	14.4	0.711	1.3
A ₁	B ₀	721	44	14.5	0.705	1.3
	B ₁	767	45	14.7	0.698	1.5
	B ₂	792	47	14.9	0.675	1.7
A ₂	B ₀	841	50	16.4	0.611	1.9
	B ₁	902	53	16.5	0.587	2.3
	B ₂	951	54	17.2	0.570	2.8
A ₃	B ₀	824	46	15.3	0.668	1.6
	B ₁	839	48	15.5	0.643	1.8
	B ₂	852	49	16.2	0.632	1.9
L.S.D		8	0.5	0.2	0.01	0.04

Second: The qualitative qualities of the quotient.

Table (1) show that ground fertilization has a clear effect on the qualitative characteristics of the yield. In total dissolved solids, we find that the A2 level outperforms the comparison coefficient A0 as it gives (16.4 and 13.7) for the transactions respectively. B0 as it reached (14.4 and 13.7), respectively. As for the interference between the transactions, the best results were when the A2B2 treatment, which gave the highest level reached (17.2).

It was noticed that adding fertilizer at the level of A2 gave the lowest acidity levels in the juice of the grains compared to the non-fertilization factor (0.611 and 0.731 (%)). When spraying with amino acid, the best results were when spraying with the treatment B2 compared to B0, the acidity ratio reached 0.711) and 0.731 (%) for transactions, respectively.

As for the overlap between the factors studied, the A2B2 treatment recorded the best results. The acidity percentage was (0.570)%, while the highest acidity was at the comparison treatment and it reached (0.731)%

As for the concentration of anthocyanin dye, the A2 toxicity level achieved the highest comparison rate with the comparison coefficient A0 (1.9 and 0.9) optical density of the mentioned parameters, respectively.

As for the acid spray treatment, the B2 treatment gave the best dye level (1.3) optical density compared to the comparison parameter B0. With regard to the interference between the study factors only, the A2B2 treatment gave the best results at all, as the dye level in this treatment reached (2.8) optical density compared with A0B0 comparison treatment that gave (0.9) optical intensity that increase the percentage of total dissolved solids in the juice of grains and low acidity in them and increase the concentration of anthocyanin tincture in grape grains. Increases The demand for it is due to the increase in total dissolved solids due to the addition of ground fertilizers from nitrogen and phosphorous and its role in increasing the vegetative group, as well as to salicylic acid, which works to accelerate the formation of chlorophyll and carotene pigments, accelerate the process of photosynthesis and increase the activity of some important enzymes that are reflected positively on the leafy area And the manufacture of foodstuffs, their transition to clusters, and their aggregation into grains, which increases total soluble solids in the grains juice (Al-Hamidawi, 2012).

The decrease in the acidity percentage in the juice of the grains when adding the ground fertilizers to the soil and spraying with the organic acid may be attributed to the role of fertilizer and acid in improving the growth of the vine and increasing the efficiency of the vegetative group in the manufacture of carbohydrates and increase the proportion of sugars and their transfer to the grains led to a decrease in the proportion of acidity in the juice as well as increasing the proportion of acidity Total soluble solids and sugars in the juice of the grains may lead to an increase in the concentration of the anthocyanin dye as between (Salisbury and Ross,) that the formation of the dyes requires the provision of an adequate amount of soluble sugars. Anthocyanins

References

A.O.A.C. (1970). Official agriculture chemist. Official Methods of Analysis II the edition D.C., USA. P. 545.

- Abu-Dahi, Y.M. (1988). Practical plant nutrition. Ministry of Higher Education and Scientific Research, University of Baghdad, House of Wisdom.
- Al-Nuaimi, S.N.A. (1999). Fertilizers and Soil Fertility, 2nd edition. Book House for Printing and Publishing, University of Mosul, Iraq.
- Al-Araji, J.M.A.; Al-Hamdani, R.I. and Al-Imam, N.M.A. (2006). Effect of nitrogen and phosphorus fertilization on vegetative growth specifications and leaf content of N and P for seedlings of Trojan strang, Tikrit University Journal for Agricultural Sciences. 6(2): 180-187.
- AlJanabi, A.Z., Ameer, A.J.; Israa, H.A. and Al-Hassan, A.H.A. (2019). Effect of adding different levels of organic manure and potassium fertilizer in the yield growth of wheat (*Triticum aestivum* L.). Plant archives Vol. 19, Special Issue, January, 2019.
- Al-Saeedi, I.H. (2000). Grape production. Book House for Printing and Publishing, University of Mosul, Iraq.
- Al-Saeedi, I.H. (2007). Response of the Sultanate and Sultan grape varieties to different levels of cytex. International Symposium on Horticultural Production Technology for Sustainable Development and Biodiversity, Aleppo, Syria. 13-20.
- Al-Saeedi, I.H. (2010). Qualitative studies: evaluating the two varieties of grapes, Kamali and Abbasi (containing flowered seeds with flowering feminine) (*Vitis vinifera* L.) for spraying with an organic product SM3. Al-Rafidain Agriculture Journal. Ministry of Higher Education and Scientific Research. Iraq.
- Al-Thafyhi, S.A. (2004). Effect of foaming sulfur and spraying with microelements residues on the green and productive traits of the two varieties of Kamali and Halawani grapes (*Vitis vinifera* L.). PhD thesis. Faculty of Agriculture, University of Baghdad, Iraq.
- Al-Thafyhi, Sami Ali Abdul-Majeed (2005). Effect of foaming sulfur and spraying residues of microelements on the quantitative and qualitative characteristics of grape yield (*Vitis vinifera* L.) confectionery. Iraqi Journal of Agricultural Sciences. Baghdad University. Iraq. 36 (6): 29-34.
- Al-Yaqoubi, Muhammad Yaqoub (1985). Introduction to plant physiology. Directorate of Dar Al-Kutub for Printing and Publishing, University of Mosul, Iraq.
- Central Statistical Organization (2011). Annual Statistical Abstract, Agricultural Statistics, Ministry of Planning, Iraq.
- Hammoud, M.S.; Al-Mikh, M.T.A. and Hanaa, A.H. (2013). The effect of N.P. fertilizer And leaf spray with vitamin in indicators of growth and chemical content of leaves of seedlings of grape, a luxury variety. Karbala University Journal. Iraq. 11(3): 165-170.
- Hassan and Salman, Jabbar Abbas, Muhammad Abbas (1989). Grape production. Ministry of Higher Education and Scientific Research, University of Baghdad, House of Wisdom.
- Hassan, D.F.; Jafaar, A.A. and Mohammed, R.J. (2019). Effect of irrigation water salinity and tillage systems on some physical soil properties. Iraqi Journal of Agricultural Sciences, 50: 21-24.
- Mohammed, R.J. (2018). The spatial variability of some chemical properties of gypsiferous soils by using GIS. International Journal of Agricultural And Statistical Sciences, 14(1): 303-312.

- Mohammed, R.J.; Abdulkadhim, K.A.; Hassan, D.F. and Kadhim, T.F. (2019). Effect of wheat straw as organic matter and different water quality on some chemical soil properties and growth of pepper (*Capsicum annuum*). In IOP Conference Series: Earth and Environmental Science, 344(1): 012034.
- Mousawi, S.S.J. (2010). Effect of urea, Qatar and number of cuttings on cuttings on the growth of grape seedlings (*Vitis vinifera* L.), French cultivar. Master Thesis. Al-Musayyib College of Technology. Ministry of Higher Education and Scientific Research. Iraq.
- Muhammad, A.A.K. (1985). Basics of plant physiology. Directorate of Dar Al-Kutub for Printing and Publishing, University of Mosul, Iraq.
- Peter, H. and Thomas, S.G. (2006). Salicylic acid. Plant Hormone Signaling. Blackwell Publishing Ltd. (8): 229-257.
- Ranganna, S. (1977). Manual of Analysis of fruit and Vegetable product. TATA MC Graw Hill pub. Co. 1td. New Delhi. 634.
- Salisbury, F.B. and Ross, C. (1968). Plant physiology. Wadsworth publishing company, Inc., Belmont, California. USA.
- Scientific Food Organization (FAO) (2008). Statistics of grape production in the world.