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Efficiency of Foliar Application with Some Plant Natural Oils on Yield and Berries Quality of Ruby Seedless Grape Cultivar

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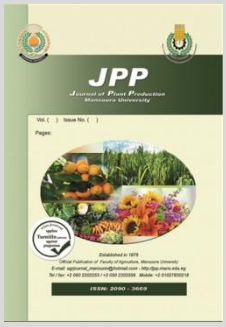

ABSTRACT

Among vineyard management objectives is enhancing grapevine nutrition to control yield and berries quality. Experiments were carried out on the "Ruby seedless" (King Ruby) grape cultivar in pomology department's experimental orchard of the faculty of agriculture, Assiut University, during the two consecutive seasons of 2022 and 2023. This study sought to determine how certain plant-based natural oils affected the yield and quality of berries produced. Findings indicated that all utilized oils had a significant impact on physical and chemical characteristics When compared to control treatment the two studied seasons. Flax and bitter Almond seed oils at 1 and 2 ml./L resulted in enhancing almost physical properties. Black Cumin and Rocket plant seed oils greatly affected almost all characteristics. So, it can be recommended to spray these oils two weeks after the setting stage and at the beginning of coloring to improve the natural characteristics and quality of the fruits of the Ruby Seedless grape variety (King Ruby) under Assiut conditions.

Keywords: environment, oils, vines, berries, yield.

INTRODUCTION

Worldwide, grapes (*Vitis vinifera* L.) are regarded as the most significant fruit crops. It rose to become Egypt's second-most popular crop, behind citrus. The area of the vineyards has increased dramatically during the last ten years.

In Egypt, the King Ruby "Ruby Seedless" grape cultivar is an important red seedless table grape cultivar. It can be grown well in Egyptian conditions, produces a huge crop, and is resistant to sunburn. Berries are average in size. This cultivar's primary flaws were its weak red color and flimsy berry tissues, which resulted in a significant loss in yield and shot berries appearing in most clusters.

Effects of natural essential oils on the chemical and physical properties such as berry TSS, TA, lycopene, and β -carotene levels were higher in fruits applied with thymol, eugenol, and menthol vapours than in control fruits (Marjanlo *et al*., 2009).

Essential oil concentration affects fruit respiration rate, which is correlated with the degree of fungal infection (Cristescu *et al*., 2002). Other researchers found that following harvesting in many plants, fruits treated with essential oils had lower rates of fruit deterioration and weight loss percentage (Wang, 2003).

The Asian Native *Nigella sativa* plant yields black seed oil; the seed of this plant has between 0.4 and 0.45% volatile oil and over 30% fixed oil (Nergiz and Otles, 1993). Black seed oil extract contains a significant amount of thymoquinone (TQ) (Ghosheh *et al*., 1999). Because TQ scavenges free radicals, it has a significant potential as an antioxidant (Hosseinzadeh *et al*., 2007).

The studies of El-Rzek *et al*., (2011) issued that spraying Olive oil 2% on 'Canino' Apricot achieved the highest yield and TSS, while acidity and firmness were decreased compared with the control.

67 volatile components, or 96.52% of the essential oil extracted from *Eruca sativa* leaves, were identified and characterized. The principal components were 1-methylthiopentanonitrile (11.25%) and 4-methylthiobutylisothiocyanate (60.13%) (Miyazawa *et al*., 2002).

Traditional methods of oil manufacturing yield sesame oil, which is rich in fat-soluble vitamins, amino acids, and unsaturated fatty acids. Minerals like Fe and Ca are abundant in sesame seeds. and include 21.9% protein and 61.7% fat, according to the studies of (Rout *et al*., 2018). Rich in nutrients, sesame seeds are known as the "crown of eight grains" and an "all-purpose nutrient bank" (Liu *et al*., 2015).

The plant that contains the highest amount of ω-3 fatty acid, also known as α-linolenic acid (ALA), is Flaxseed (Gebauer *et al*. 2006).

Cunnane *et al*., (1993) issued that Flaxseed oil has a low percentage of saturated fatty acids (9%) a moderate percentage of monosaturated fatty acids (18%), and a high percentage of polyunsaturated fatty acids (73%).

The primary fatty acid in flaxseed oil, with a range of 39.00 to 60.42 percent, is α-linolenic acid. It is followed by oleic, linoleic, palmitic, and stearic acids, offering a good ω-6:ω-3 fatty acid ratio of roughly 0.3:1 (Pellizzon *et al*. 2007).

Traditional flaxseed oil readily oxidises following extraction and purification, despite flaxseed's inherent high concentration of antioxidants such as tocopherols and betacarotene (Holstun and Zetocha 1994).

The type of flax consumed affects the bioavailability of ALA; according to Austria *et al*. (2008), ALA (Alpha-linolenic acid) is more bioavailable in oil than in milled seed and more bioavailable in oil and milled seed than in whole seed.

The findings of El Kouacheur *et al*., (2023) demonstrated that 35.5% oil is extracted from bitter almond seeds. This oil provides an advantageous source of healthy fats. High in minerals like Fe and Ca are sesame seeds.

Jojoba oil is commonly referred to as liquid wax rather than oil or fat since it is mostly made up of wax esters, sterols,

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and vitamins, with only small amounts of triglyceride esters (Kramer, 2012).

The findings of Qaoud (2019) demonstrated that applying 2 % of onion and garlic oils to the Naomi Mango cultivar was more successful in improving fruit shape, hardness, and tree yield. It also produced the best red color and reduced enzyme activity. Black seed oil displayed the lowest TSS/TA ratio and enhanced the proportion of fruit acidity.

Also, Jojoba and canola oils at 1.0 % reduced berry and must titratable acidity and increased berry must and wine pH of 'Auxerrois' and 'Riesling' Grapevines (Reynolds, 2005).

Therefore, the purpose of this study was to assess how certain plant natural oils affected the quality and production of Ruby seedless grapevines.

MATERIALS AND METHODS

Vineyard site and plant material:

Experiments were carried out on the "Ruby seedless" grape cultivar in the fruit department's experimental orchard of the faculty of agriculture, Assiut University, during the course of two consecutive seasons in 2022 and 2023. At the start of the trial, the 16-year-old King Ruby "Ruby seedless" cultivar was planted 2 × 2.5 meters apart on their own root at clay soil irrigated with surface irrigation. A completely randomized block design was used to select thirty-nine standardized vines. They were pruned using a traditional cane training method, leaving six fruiting canes, six to eight buds per cane, and seven to eight renewal spurs. As a result, each vine had 36–48 buds remaining.

Treatments:

1- Spraying 1.0 ml/L of Jujube oil (*Ziziphus jujuba*)
2- Spraying 2.0 ml/L of Jujube oil (*Ziziphus jujuba*)
3- Spraying 1.0 ml/L Black cumin oil (*Nigella sativa*)
4- Spraying 2.0 ml/L Black cumin oil (*Nigella sativa*)
5- Spraying 1.0 ml/L Sesame oil (*Sesamum indicum*)
6- Spraying 2.0 ml/L Sesame oil (*Sesamum indicum*)
7- Spraying 1.0 ml/L Flax seed oil (*Linum usitatissimum*)
8- Spraying 2.0 ml/L Flax seed oil (*Linum usitatissimum*)
9- Spraying 1.0 ml/L Bitter almond seed oil (*Prunus amygdalus*)
10- Spraying 2.0 ml/L Bitter almond seed oil (*Prunus amygdalus*)
11- Spraying 1.0 ml/L Rocket plant seed oil (*Eruca sativa*)
12- Spraying 2.0 ml/L Rocket plant seed oil (*Eruca sativa*)
13- Control (water only)

Using a Knapsack sprayer (20 L), vines were treated at 1 ml/L and 2 ml/L each time. The spraying solutions were supplemented with 0.5 ml/L of Tween-80, a surfactant and solvent. Twice, the spraying solutions were used: once at two weeks after the berries set and at the start of coloration. Thirty-nine uniform vines with three replicates of each treatment, were selected to set up the experiment. Irrigation, soil management, fertilization, and other horticultural practices were carried out as suggested, and all oils were bought from the faculty of agriculture's medicinal plants processing and extraction unit at Assiut University.

Measurements:

Physical characteristics:

1- Yield (kg/vine) components: cluster weight (g.) and Cluster no. / vine.
2- Cluster shape index (H/W).
3- Weight of 100 berries (g.).
4- Juice volume of 100 berries (ml.)

Chemical characters:

1– Total soluble solids (TSS %): By using a hand refractometer (ATAGO N-IE).

2- Total acidity (T.A): according to A.O.A.C. (1984).

The total acidity was expressed as Tartaric acid according to the following equation:

$$\text{Acidity (\%)} = \frac{\text{NaOH volume used in titration} \times \text{NaOH molarity} \times \text{equivalent weight of Tartaric acid}}{1000 \times \text{sample volume}} * 100$$

Where:

Equivalent weight of Tartaric acid =75
NaOH molarity = 0.1M
Sample Vol. = 5 ml.

1- TSS / acid ratio was then calculated.
2- Reducing sugars (%): According to Lane and Eynon procedure outlined in A.O.A.C. (1985).

Statistical analysis:

The study was designed as a randomized complete block design (RCBD) (control plus six oil treatments each with two different concentrations (1 and 2 ml/L), and each treatment has three replicates). ANOVA was performed using Proc Mixed of the SAS software version 9.2 (SAS, 2008), and means were compared using the revised L.S.D. test at the 5% level of probability (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

All studied measurements were increased significantly by all spraying treatments compared to the control.

1- Cluster weight (g):

According to the results in (Table 1 and Fig. 1), in the 1st season, Flax seed oil at 2 ml/L, Rocket plant seed oil at 1 ml/L and Jujube oil at 2 ml/L recorded the highest weight (399.5, 398.1 and 392.1 g) in contrast to the control which registered the lowest weight (319.5 g), where spraying bitter Almond seed oil at 2 ml/L and Rocket plant seed oil at 2 ml/L significantly recorded the highest values (391.8 and 390.0 g) compared to the control which gave the least weight (340.0 g) during the 2nd season of study.

2- Yield (kg/ vine):

Based on the findings in the same table (table 1 and fig. 2), at the 1st season, Flax seed oil and bitter Almond seed oil (at 1 ml/L for each) recorded the highest yield (13.5 and 13.0 kg) compared to the check treatment which recorded the lowest yield (9.6 kg). Also, spraying Flax seed oil at 1 ml/L and bitter Almond seed oil at 2 ml/L recorded the highest yield (17.4 and 17.2 kg) compared to the check treatment which gave the lowest yield (12.2 kg) during the 2nd season of study.

Table 1. Impact of foliar application with some plant natural oils on cluster weight and yield of Ruby Seedless grapevines during 2022 and 2023 seasons.

Treatments	Cluster weight (g)		Yield (kg./ vine)	
	2022	2023	2022	2023
Jujube oil 1 ml/L	350.5	382.1	12.3	16.0
Jujube oil 2 ml/L	392.1	381.9	12.5	14.5
Black cumin oil 1 ml/L	366.0	357.4	11.0	13.9
Black cumin oil 2 ml/L	374.8	383.7	12.7	15.0
Sesame oil 1 ml/L	337.2	364.0	11.1	16.0
Sesame oil 2 ml/L	386.5	371.9	12.8	13.8
Flax seed oil 1 ml/L	375.1	387.1	13.5	17.4
Flax seed oi 2 ml/L	399.5	377.1	12.0	15.5
Bitter almond seed oil 1 ml/L	351.0	385.0	13.0	15.4
Bitter almond seed oil 2 ml/L	346.1	391.8	12.1	17.2
Rocket plant seed oil 1 ml/L	398.1	378.0	12.7	14.4
Rocket plant seed oil 2 ml/L	355.8	390.0	12.1	14.0
Control (water only)	319.5	340.0	9.6	12.2
R. LSD	10.10	13.42	0.83	0.60

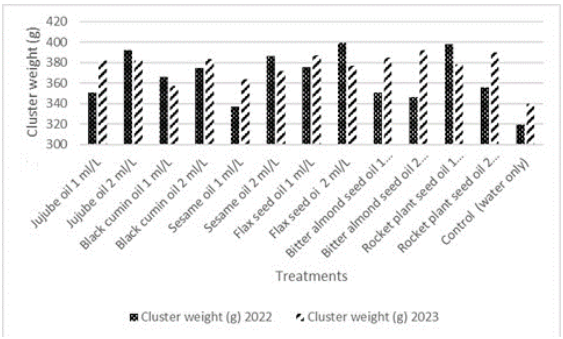

Fig. 1. Impact of foliar application with some plant natural oils on cluster weight of Ruby Seedless grapevines during 2022 and 2023 seasons.

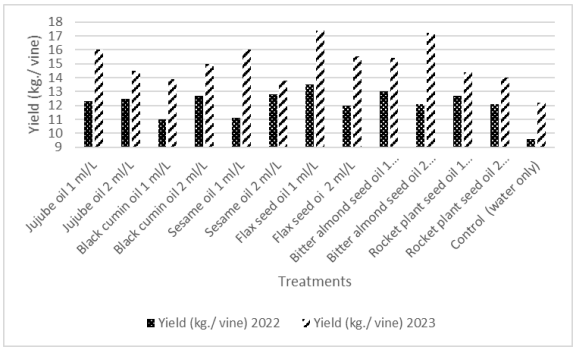

Fig. 2. Impact of foliar application with some plant natural oils on yield of Ruby Seedless grapevines during 2022 and 2023 seasons.

Our results were online with those issued by El-wasfy *et al.* (2013) stated that garlic and onion oil improved the yield of orange trees, Chowdhury *et al.* (2007) found that extracts from garlic improved the number of fruits and yield of Ub´a mango trees.

Cluster Shape Index (H/W):

The findings of (table 2 and fig. 3) stated that, in the 1st season, black Cumin oil (at 1 and 2 ml/L) gave the highest index (2.34 and 2.33) compared to the control which recorded the lowest index (1.42). Also, spraying black Cumin oil at 2 ml/L and Rocket plant seed oil at 1 ml/L reported the highest index (1.67 for each) in comparison with the control which recorded the lowest index (1.46) during the 2nd season of study.

3- Weight of 100 berries (g):

As per the findings in the same table (table 2 and fig. 4), in the 1st season, Jujube oil at 2 ml/L and bitter Almond seed oil at 1 ml/L recorded the highest weight (203.6 and 204.8 g) compared to the check treatment which gave the least weight (131.6 g). At the 2nd season of study, spraying black Cumin oil and Flax seed oil (at 2 ml/L for each) recorded the highest weight (219.8 and 213.8 g) compared to the check treatment which gave the lowest weight (173.1 g).

Our findings – in this respect - concurred with those found by El-Rzek *et al.* (2011) when spraying olive oil at 1 and 2 % on 'Canino' Apricot trees that increased fruit weight. Also, black seed oil treatments significantly affected the maintenance of pomegranate fruit weight (Kahramanoğlu *et al*., 2018), However, when canola and jojoba oils were applied at a rate of 1.0% to "Auxerrois" and "Riesling" grapevines, field-grown vines' vigour, yield, and berry composition were unaffected (Reynolds, 2005).

4- Juice volume of 100 berries (ml):

As per the findings in the same table (Table 2 and Fig. 5), in the 1st season, Flax seed oil at 1 ml/L gave the highest juice volume (132.6 ml) compared to the control which recorded the lowest juice volume (101.2 ml).

Table 2. Impact of foliar application with some plant natural oils on cluster shape index, weight of 100 berries and juice volume of 100 berries of Ruby Seedless grapevines during 2022 and 2023 seasons.

Treatments	Cluster Shape Index (H/W)		Weight of 100 berries (g)		Juice volume of 100 berries (ml)	
	2022	2023	2022	2023	2022	2023
Jujube oil 1 ml/L	1.99	1.52	180.4	186.8	110.2	106.8
Jujube oil 2 ml/L	2.13	1.61	203.6	188.6	112.2	102.4
Black cumin oil 1 ml/L	2.34	1.58	192.6	194.4	116.2	103.4
Black cumin oil 2 ml/L	2.33	1.67	141.6	219.8	128.8	127.2
Sesame oil 1 ml/L	1.99	1.64	173.4	201.6	120.8	123.8
Sesame oil 2 ml/L	1.72	1.48	184.8	205.1	125.0	123.6
Flax seed oil 1 ml/L	1.46	1.63	194.4	209.6	132.6	124.8
Flax seed oi 2 ml/L	1.46	1.76	187.6	213.8	118.6	132.4
Bitter almond seed oil 1 ml/L	1.75	1.57	204.8	206.7	122.0	137.4
Bitter almond seed oil 2 ml/L	1.77	1.51	167.6	191.1	105.4	112.2
Rocket plant seed oil 1 ml/L	1.74	1.67	167.4	187.7	111.0	106.8
Rocket plant seed oil 2 ml/L	1.89	1.58	179.6	181.0	114.8	110.6
Control (water only)	1.42	1.46	131.6	173.1	101.2	100.8
R. LSD	0.013	0.008	7.13	5.20	1.67	1.24

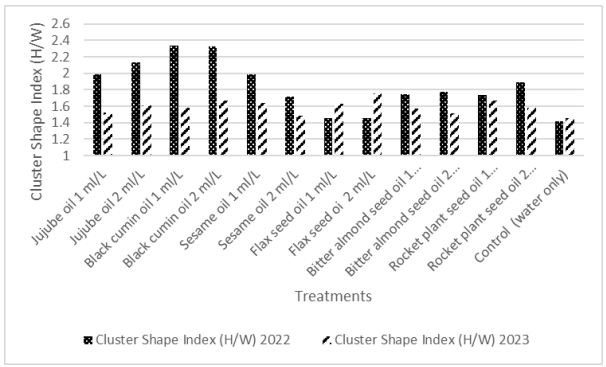

Fig. 3. Impact of foliar application with some plant natural oils on cluster shape index of Ruby Seedless grapevines during 2022 and 2023 seasons.

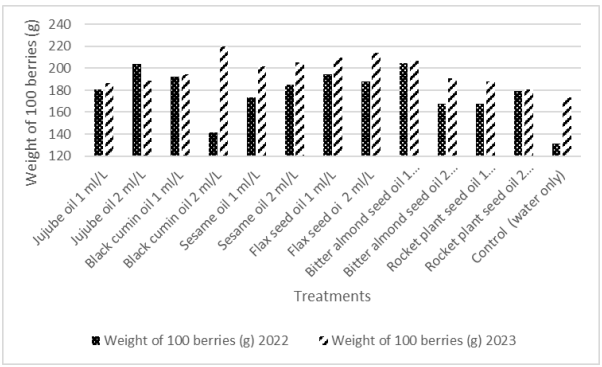

Fig. 4. Impact of foliar application with some plant natural oils on Weight of 100 berries (g)of Ruby Seedless grapevines during 2022 and 2023 seasons.

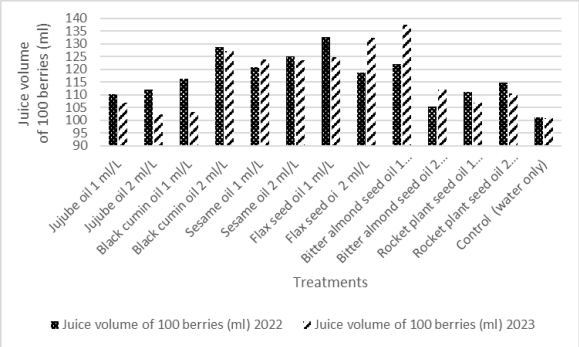

Fig. 5. Impact of foliar application with some plant natural oils on Juice volume of 100 berries (ml) of Ruby Seedless grapevines during 2022 and 2023 seasons.

In the 2nd season of study, spraying Flax seed oil at 2 ml/L and bitter Almond seed oil at 1 ml/L recorded the highest juice volume (132.4 and 137.4 ml) compared to the check treatment which gave the lowest value (100.8 ml).

These results are in agreement with those reported by Kahramanoğlu *et al.*, (2018) who found that black seed oil treatments significantly affected the maintenance of pomegranate juice content.

5- TSS (%):

In light of the findings in (Table 3 and Fig. 6), in the 1st season, Rocket plant seed oil at 1 ml/L recorded the highest percentage (19.42%) in contrast to the check treatment which gave the lowest TSS (15.34%). Whereas, in the 2nd season of study, spraying Jujube oil at 1 ml/L recorded the highest TSS (19.10 %) contrasted with the check treatment which gave the lowest TSS (16.46%).

Our findings corroborated those of Chowdhury et al. (2007), who reported that TSS of Ub´a mango trees was enhanced by garlic extracts. On the other hand, Qaoud (2019) reported that garlic oil delayed the ripening of Naomi mango fruit and reduced fruit TSS compared to control.

6- Acidity (%):

Results in the same table (Table 3 and Fig. 7), in the 1st season, Jujube oil and Rocket plant seed oil (at 1 ml/L for each) gave the lowest acidity (0.37 % for each) compared to the control treatment which gave the highest acidity (0.47%). Whereas, in the 2nd season of study, spraying Sesame oil at 1 ml/L recorded the lowest acidity (0.30%) as opposed to the control which recorded the highest acidity (0.46%).

Our results – in this respect - are online with those found by Reynolds (2005) when application of Jojoba and canola oils at 1.0 % on 'Auxerrois' and 'Riesling' Grapevines and weren't in agreement with those found by El-Rzek *et al.*, (2011) when spraying olive oil at 1 and 2 % on 'Canino' Apricot Trees.

7- TSS/ acid:

Also, in the same table (Table 3 and Fig. 8), in the 1st season, Rocket plant seed oil at 1 ml/L gave the highest ratio (52.49) compared to the control which recorded the lowest ratio (32.64). On the contrary, in the 2nd season of the study, spraying Sesame oil at 1 ml/L recorded the highest ratio (61.93) compared to the check treatment which recorded the lowest ratio (35.78).

Our results – in terms of TSS and TSS/ acid - concurred with the findings of El-Rzek *et al.*, (2011) when spraying olive oil at 2 % on 'Canino' Apricot Trees, otherwise at 1%.

8- Reducing sugars (%):

As per the findings in the same table (Table 3 and Fig. 9), in the 1st season, Rocket plant seed oil at 1 ml/L recorded the highest percentage (17.72 %) compared to the control which recorded the lowest percentage (13.65 %).

Table 3. Impact of foliar application with some plant natural oils on TSS, total acidity, TSS/ acid and reducing sugars of Ruby Seedless grapevines during 2022 and 2023 seasons.

Treatments	TSS (%)		Total acidity (%)		TSS/ acid		Reducing sugars (%)	
	2022	2023	2022	2023	2022	2023	2022	2023
Jujube oil 1 ml/L	16.44	19.10	0.37	0.32	44.43	59.69	14.23	17.47
Jujube oil 2 ml/L	18.48	18.73	0.42	0.42	44.00	44.60	15.99	16.87
Black cumin oil 1 ml/L	16.64	17.89	0.43	0.44	36.37	40.66	14.29	15.71
Black cumin oil 2 ml/L	16.41	17.90	0.41	0.33	37.59	54.24	14.49	15.75
Sesame oil 1 ml/L	16.52	18.58	0.40	0.30	41.30	61.93	14.61	16.63
Sesame oil 2 ml/L	16.70	18.02	0.42	0.41	37.38	43.95	14.83	16.29
Flax seed oil 1 ml/L	16.55	17.22	0.42	0.38	39.40	45.32	14.83	15.29
Flax seed oi 2 ml/L	16.54	17.60	0.44	0.39	37.59	45.13	14.15	15.81
Bitter almond seed oil 1 ml/L	18.57	17.86	0.43	0.31	43.19	57.61	15.83	15.83
Bitter almond seed oil 2 ml/L	17.55	16. 89	0.43	0.44	40.81	38.39	15.00	14.69
Rocket plant seed oil 1 ml/L	19.42	18.10	0.37	0.32	52.49	56.56	17.72	16.84
Rocket plant seed oil 2 ml/L	16.04	17.64	0.42	0.42	38.19	42.00	14.98	15.40
Control (water only)	15.34	16.46	0.47	0.46	32.64	35.78	13.65	14.64
R. LSD	0.18	0.21	0.03	0.01	1.88	1.60	0.08	0.03

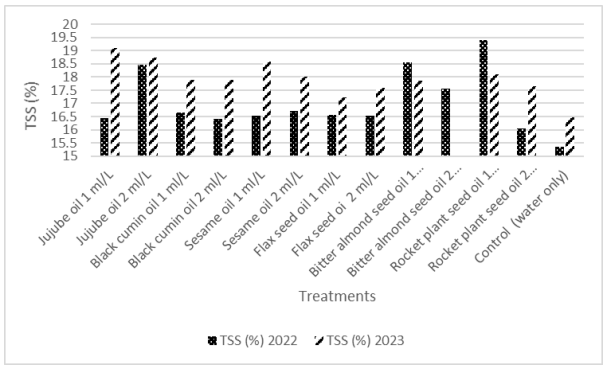

Fig. 6. Impact of foliar application with some plant natural oils on TSS (%) of Ruby Seedless grapevines during 2022 and 2023 seasons.

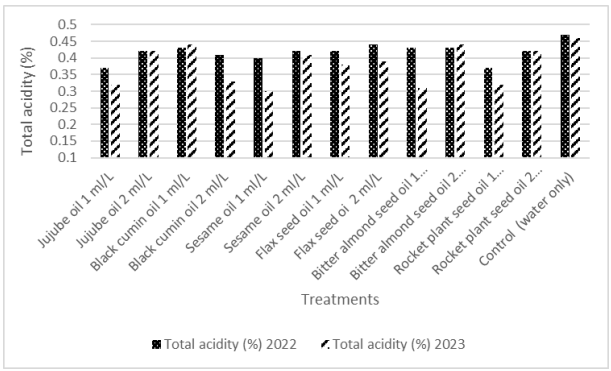

Fig. 7. Impact of foliar application with some plant natural oils on Total acidity (%) of Ruby Seedless grapevines during 2022 and 2023 seasons.

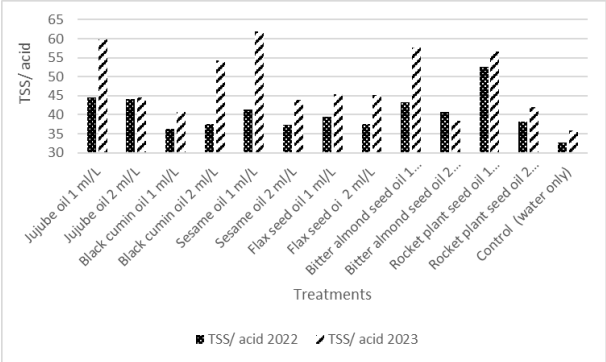

Fig. 8. Impact of foliar application with some plant natural oils on TSS/ acid of Ruby Seedless grapevines during 2022 and 2023 seasons.

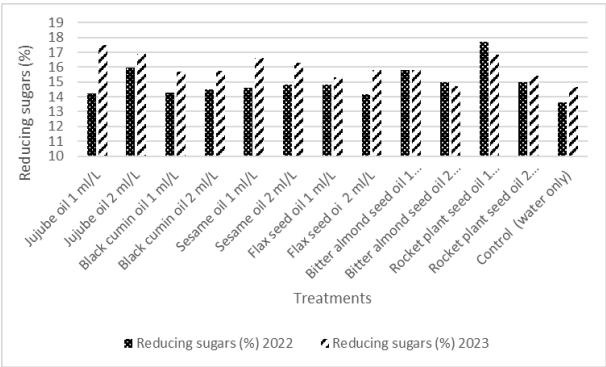

Fig. 9. Impact of foliar application with some plant natural oils on Reducing sugars (%) of Ruby Seedless grapevines during 2022 and 2023 seasons.

In the 2nd season of study, spraying Jujube oil at 1 ml/L recorded the highest percentage (17.47 %) compared to the check treatment which recorded the lowest percentage (14.64 %).

The finding of sugar content are agreed with results obtained by Ahmed *et al*., (2009) who reported that cv.'Florida prince'Peach fruits treated with mineral oil reached higher sugar content,

Also, garlic oil increased the reducing sugars of Naomi Mango Cultivar (Qaoud, 2019). Generally, the results of physical and chemical attributes of the current study are in line with those obtained by El-Akad *et al.* (2021), who used jasmine oil with GA_3 on "Ruby seedless" grape cultivar, and also agreed with the findings of Karimi *et al*., (2021) when spraying agricultural grade mineral oil on "Thompson seedless" grape cultivar.

Also, our results concerning berry quality agreed with those found by Kahramanoğlu *et al.* (2018) who indicated that black seed oil application has considerable effects on the postharvest quality of Pomegranates.

Discussion:

Plants are used to extract oils from their leaves, flowers, stems, seeds, and even roots. Volatile oil is typically present in aromatic plants in all of its forms and quantities.

Utilizing natural oils is the new alternative that has emerged recently for raising fruit quality and production. Jasmine is a type of plant endogenous hormone that includes compounds such as methyl jasmonate, jasmonic acid, and others.

Olive oil was the catalyst for breaking buds, which enhanced fruit attributes, yield, and flowering % (Ahmed *et al*., 2009).

Higher yield might be a result of higher concentrations of elements like phosphorus in the leaves of trees sprayed with mineral oil alone or in combination with dietary supplements may be the result of mineral oil stabilizing nutrients in the leaves (Alipour and Ghafari, 2010).

These minerals when combined with mineral oil can boost vital nutrients, which is appropriate for the plant's reproductive growth during the growing season.

Recommendation:

Flax and bitter almond seed oils at 1 and 2 ml/L improved nearly all physical properties. The oils from black cumin and rocket plant have a significant impact on nearly all chemical properties.

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كفاءة الرش الورقى ببعض الزيوت الطبيعية النباتية على محصول وجودة حبات صنف العنب روبى سيدلس

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الملخص

يعتبر العنب أحد أهم محاصيل الفاكهة على مستوى العالم، وقد توسعت مزارع العنب بشكل كبير في المساحة خلال السنوات العشر الماضية. أجريت هذه الدراسة خلال موسمى 2022 ، 2023 بمزرعة الفاكهة ، كلية الزراعة ، جامعة أسيوط - بهدف دراسة تأثير رش تركيزين مختلفين (1 و2 مل/ لتر) من 6 أنواع مختلفة من الزيوت الطبيعية النباتية (الجوجوبا، حبة البركة، السمسم، بذرة الكتان، بذرة اللوز المر وبذرة الجرجير) على كرمات العنب روبى سيدلس (كنج روبى) عن طريق الرش مرتين: بعد العقد بأسبوعين ، والثانية عند بداية التلوين ، حيث تم اختيار 39 كرمة متماثلة الصفات .وقد أظهرت النتائج أن الرش بأنواع الزيوت المختلفة المستخدمة بتركيز 1 و 2 مل/ لتر أدى إلى حدوث زيادة معنوية فى الطبيعية والكيميائية التى تم تقديرها (زيادة معنوية فى كمية المحصول والصفات الطبيعية والكيميائية للعناقيد والتى تم تقديرها مقارنة بمعاملة الكنترول) .وبالتالى يمكن التوصية برش زيت الكتان واللوز المر بعد مرحلة العقد بأسبوعين وعند بداية التلوين لتحسين الصفات الطبيعية وجوده الثمار لصنف العنب روبى سيدلس (الكنج روبى) تحت ظروف اسيوط.

الكلمات المفتاحية: البيئة – الزيوت – الكرمات – الحبات - المحصول