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Effect of some Treatments on Reducing Sunburn in Red Globe Grapevines

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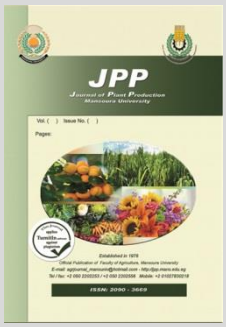

ABSTRACT

study the effect of some treatments shows that sunburned berries % was significantly reduced with spraying Kaolin at 4 %, Purshade at 4%, Screen Duo at 12 cm^3/L, GA_3 at 10 ppm+ 2 % Urea was investigated on the control of sunburn effects, berry temperature and yield quality of red globe grapevines grown under the Egyptian hot conditions during 2019 and 2020 seasons. The vines received three sprays of Kaolin, purshade and Screen Duo at (first-June, mid-June and mid-July), while GA_3 and Urea were sprayed twice at two weeks after fruit setting and 30 days later for both seasons. Results showed that all treatments reduced berry temperature. The application of Screen Duo surpassed the application of Kaolin, Purshade and GA_3 plus Urea in this respect as it was one of the most effective techniques in controlling. However, spraying in all treatments effectively reduced sunburned berries %, total acidity and improved yield quality, cluster weight, total soluble solids, anthocyanin and reducing sugar. Treatment with Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea gave the best results concerning Growth parameters, yield, cluster weight, cluster length, cluster width, sunburns and some physical and chemical properties of berries grapes. Control treatment gave the lowest value concerning all parameters in two seasons.

Keywords: Red globe, kaolin, purshade, Screen Deo, GA_3 and Urea.

INTRODUCTION

The red globe grape is considered the largest red grape of all the red grape varieties. In the ripe stage, red globe berries have a ruby red colour, moderately sweet taste and large seeds. It is preferred in China and USA markets Crisosto and Gayle, (2002). It is genetically characterized by having low vegetative growth Gasser, (2006). It is Picked in August, as clusters are exposed to high temperatures during the growing season. The agreeable production of yield and clusters of red globe cv. face a challenge like low vine foliage, berry sunburn damage and compactness of the clusters. In Summer, the air temperature usually reaches above 40 C. and Red globe grape is known for its low-density foliage. During the growing season, many clusters are exposed to the direct effect of sunlight. This effect may cause damage to berries or clusters. This damage appears as dark spots or areas on berry skin that develop with time to wilt berries in the direction of sunlight Melgarejo *et al.*, (2004). These damages render cluster berries unmarketable due to sunburn damage, causing exceed 25% losses in yield. These defects appear in reducing berries quality in red globe grapevines. Chemical reflections such as kaolin, Screen Duo and Purshade have been tried to decrease sunburn damages in different fruit crops.

Kaolin ($Al_2Si_2O_5(OH)_4$) is an inert white clay that can increase the reflection of radiation reaching the leaf surface, thereby reducing the heat load of the trees Rodriguez *et al.*, (2019). Purshade acts in a similar way to kaolin. Foliar application with 2% purshade reduce sunburn incidence from 14.8–15% (control) to 1.7- 2% In Red Roomy grapes Ahmed *et al.*, (2013). Results from experiments on grapes, as well as on pomegranate fruit treated with kaolin showed an increase in total polyphenols, anthocyanin, and ascorbate content Dinis *et al.*, (2016), Bernardo *et al.*, (2017), Dinis *et al.*, (2018), Sharma *et al.*, (2018), and Frioni *et al.*, (2019) and Luzio *et al.*, (2021). The application of particle films increases the reflection of radiation and reduce sunburn damage.

Screen Duo (commercial Kaolin clay) when applied, forms a reflective barrier film to protect the plant tissue from damaging UV and IR light to reduce the overall temperature of the plant. In addition, Screen Duo contains a naturally occurring compound found in all crops that triggers the innate stress mechanism to protect the plant from abiotic stress. Screen duo may increase plant vigor, total yield and quality in many crops. Under high ambient temperatures, screen duo reduces canopy temperature, reducing heat, light and water stress. The reduction of stress results in increase fruit quality, such as increase total soluble solids and fruit size. Other benefits include improved colour, fruit drop, sunburn and cracking. Screen Duo reflects damaging UV and IR radiation and heat while still allowing photosynthesis and the uptake of nutrients and crop protection products Zaky *et al.*, (2018). Moreover, spraying screen duo at 12 or 18 cm^3 / L twice at mid of both June and July positively affected prevention fruit sunburn damage and enhanced yield and fruit quality of Keitt mango Baiea *et al.*, (2018).

Using some compounds such as GA_3 and urea helps to increase the vine growth vigour that would help reduce solar radiation, especially UV wavelengths reaching the surfaces of leaves and clusters, thereby lowering their

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temperatures and heat stress without restricting gas exchange Glenn *et al*., (2001). GA_3 are groups of naturally occurring plant hormones involved in several aspects and functions of the growth and development of grapes Roller, (2003). Physiological studies revealed that GA_3 plays an essential role in internode elongation. It stimulates cell division and extension in response to light or dark Ogawa *et al.,* (2003). Amongst the various functions of GA_3 are to stimulate stem elongation and inhibit leaf senescence Durner, (2013). Salwa and Hitham (2019) found that foliar application GA_3 enhanced the growth vigour of red globe grapevines. Urea application generally modified amino acid concentrations, especially with high doses. Urea foliar application should be considered a tool for increasing the percentage of amino acids in grapevines Alvarez *et al.,* (2016). application of GA_3 and urea improve berry thinning and reduced berries sunburn Farid and Ashraf, (2019).

Therefore, this study aimed to clarify the beneficial effects of spraying Red globe grapevines with Kaolin, Purshade, Screen Duo and GA_3 plus Urea alone or in combination on the yield and quality of the berries.

MATERIALS AND METHODS

This study was carried out during the 2019 and 2020 seasons on 48 uniform in vigor 14- years old Red globe grapevines in a private vineyard located at matey, Minia governorate. This area is characterized by a very hot climate and high solar radiation. Red Globe grapevines spaced 2 x 3 m grown in sandy soil were used in this investigation. Vines were cane pruned, trellised by a Spanish Parron system with a bud load of 84 buds/vine (7 canes x 12 buds). Pruning was carried on the 15 of January and irrigated via a drip irrigation system. Forty-eight uniform vines were chosen based on their growth depending on the weight of pruning and trunk diameter of the vine as indirect estimates for vine vigour. All the selected vines received the same horticultural practices that already applied in the vineyard, except those dealing with Kaolin, Purshade, Screen Duo and GA_3 plus Urea.

Soil analysis was done according to Wilde *et al.,* (1985) and the obtained data are shown in Table (1).

Table 1. Physical and chemical analysis of the vineyard soil

Physical analysis	Sand [%]	45.6
	Silt [%]	19.4
	Clay [%]	35.7
	texture	sandy
Chemical Analysis	Organic matter [%]	1.25
	PH [1:2.5 Extract]	7.5
	EC [mmhos/cm 25°C]	2.5
	Ca Co3 [%]	19.45
	N [ppm]	20.89
	P [ppm]	3.45
	K [ppm]	76.45
	Ca [ppm]	66.78
	Mg [ppm]	4.78
	Fe [ppm]	1.65
	Mn [ppm]	0.85
	Cu [ppm]	064
	Zn (ppm)	1.98

Eight treatments were involved in the present treatment arranged as follows: -

- Control
- Kaolin at 4%
- Purshade at 4%
- Screen Duo at 12 cm^3/L
- GA_3 at 10 ppm+ 2 % Urea
- Kaolin at 4 % + GA_3 at 10 ppm+ 2 % Urea
- Purshade at 4% + GA_3 at 10 ppm+ 2 % Urea
- Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea

Kaolin, purshade and Screen Duo were sprayed three times at First-June, mid-June and mid-July. GA_3 and Urea were sprayed twice at two weeks after fruit setting and 30 days later for both seasons.

Experimental design:

Experiments were performed using a randomized complete block design (RCBD) with three replications, two vines each.

The following parameters were measured to evaluate the effect of different treatments.

1-Climatic data: Data of microclimatic factors was recorded weekly in each treatment and compared with those of the untreated treatments to identify the effect of each compound in improve the cluster microclimate as follow:

- Light intensity
- Canopy temperature.
- Berry temperature.

They were measured using "Scheduler Plant Stress Monitor," Standard Oil Engineered Materials Co., Ohio, USA. The microprocessor of the apparatus used all the measurements mentioned above to calculate the average canopy microclimate in order to find the relationship between the microclimate and the effect of different compound which was used in this investigation.

2 -**Vegetative** growth criteria such as main shoot length (cm), number of leaves/shoot, total leaf area $(m)^2$ per vine Ahmed and Morsy, (1999).

3 -Harvesting was recorded when the TSS/ acid reached 25/ 1 for the control treatment. Yield expressed in weight (kg) and number of clusters/vine.

4 -Weight (g), length and width of cluster (cm).

5 -Percentages of sun-burned berries.

6- Physical and chemical characteristics of the berries namely berry weight (g), berry length (cm), berry width (cm), TSS %, total acidity % (as g tartaric acid/100 ml juice), reducing sugar (A O A C, 2000) and total anthocyanins (mg/1 g F.W) Fulcki and Francies, (1968).

Statistical analysis

All the obtained data were tabulated and statistically analyzed according to Mead *et al.,* (1993) using a new LSD test at 5 % for made all comparisons among different treatment means.

RESULTS AND DISCUSSION

Microclimatic Measurements

Average Sunlight Intensity (1000 Lux): Data in Figure (1) Show the light intensity at the canopy of the vines as affected by various treatments. The treatments showed different effects compared to the control. The treatment with •Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea recorded the lowest light intensity, while the control vines

recorded the highest light intensity. However, solar radiation was reported to cause sunburn in various crops Lipton, (1977). and thus, balancing the light intensity and the canopy surface area as mentioned by Repková and Olšovská (2009), who found that shaded environment consistently increased final leaf length

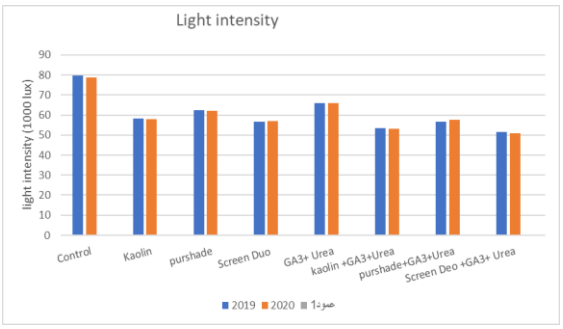

Fig. 1. Average light intensity as affected by studied treatments for red globe the two growing seasons (2019 and 2020).

Average Canopy Temperature °C: showed the measured air temperature around the canopy for the two growing seasons. It is significantly different by 3-8°C higher than the berry temperature. However, the highest temperature was recorded in control at about 45°C and the lowest was obtained from vines treated with a combination of Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea. Kaolin is a mineral chemically inert that sprayed on crops to form a white powdery film that reduces canopy temperature and reduces water and heat stress and sunburn damage Glenn and Puterka, (2005). However, vines with the kaolin-particle film had the coolest leaf and canopy temperature Cooley *et al.*, (2010).

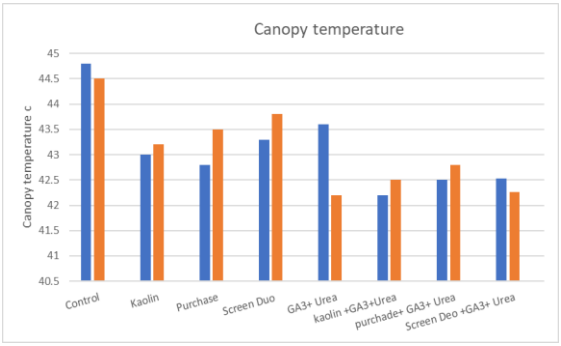

Fig. 2. Average Canopy temperature as affected by all treatments for red globe the two growing seasons (2019 and 2020).

These results were due to their positive effect in increasing the leaf area, which reduces the berries' sunburn. Millar, (1972) has shown shading by foliage alone can reduce Muscat of Alexandria berry temperatures by above 10°C. In addition, the high temperatures and irradiance caused berries to ripen more slowly and contributed to a severe incidence of sunburn and shrinkage on the berries, especially on the western side of the canopy Greer, and Weedon, (2013).

Berry temperature:

Data in fig. 3 Showed that clusters of the treatments exposed to more sunlight in the (GA_3 + Urea), has a higher berry temperature more than the less exposed ones as in Purshade, followed by the Kaolin and Screen Duo treatment. The lowest temperature was obtained from vines treated with a combination of Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea. But the highest temperature was obtained from the untreated vines Also, Tomasi *et al.*, (2003) report a temperature difference of 8° C or more in grape berries from the same bunch, both directly exposed to sunlight or not.

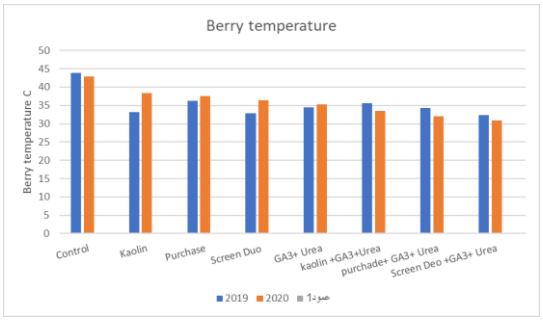

Fig. 3. Average berry temperature as affected by studied treatments for red globe the two growing seasons (2019 and 2020).

Growth parameters

The results of this investigation in Table 2 show that foliar spraying with Kaolin, Purchase, Screen Duo and GA_3 plus Urea had a significant effect on shoot length and leaf area in two seasons and No. of leaves/shoot in the first season. While had no significant effect on No. of leaves/shoot in the second season. Using GA_3 + Urea was preferable to using Screen Duo, Kaolin and Purshade to increase shoot length and leaf area in two seasons. Treatment with Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea gave the best results concerning growth parameters in the first season, while treatment with GA_3 at 10 ppm+ 2 % Urea gave the best results concerning growth parameters in the second seasons. Control treatment gave the lowest value concerning growth parameters in the two seasons.

Table 2. Effect of spraying Kaolin, Purshade, Screen Duo and GA_3 plus Urea on Shoot length [cm], Total leaf area/vine (m^2) and No. of leaves/shoot of Red globe grapevines during 2019 and 2020 seasons.

Treatments	Shoot length (cm)		Total leaf area/vine (m^2)		No. of leaves/shoot	
	2019	2020	2019	2020	2019	2020
Control	92.267	96.50	15.70	15.33	28.33	30.33
kaolin	101.00	107.00	16.30	16.63	32.00	33.67
Purshade	94.43	102.60	15.73	16.17	31.67	31.33
Screen Duo	103.13	109.33	16.43	17.40	32.00	33.67
GA_3+ Urea	104.57	121.33	16.90	18.23	33.00	35.67
Kaolin+GA_3+Urea	108.67	114.67	17.47	17.53	33.33	33.33
Purshade + GA_3+Urea	106.67	112.67	17.03	17.37	32.00	33.00
Screen Duo+GA_3+Urea	111.17	119.67	18.40	17.23	35.67	34.33
New L.S.D. at 5%	3.3	4.77	0.77	0.64	3.36	N.S

The results of this investigation demonstrated that the application of GA_3 plus Urea in combination improved growth indicators of Red globe vines as it increased leaf area, shoots length, and the number of leaves per shoot of Red globe grapevines.

The direct effect of GA_3 on stimulating cell division and cell enlargement, and increasing vegetative growth. GA_3 is also reported to promote growth by increasing plasticity of the cell wall followed by the hydrolysis of starch into sugars, which reduces the cell water potential, resulting in the entry of water into the cell and causing elongation Richard, (2006). Moreover, the application of GA_3+Urea in the present study improved the vegetative growth of Red globe Farid and Ashraf, (2019).

the percentage of sunburned berries: -

Data in Table 3 clearly show that sunburned berries % was significantly reduced with spraying Kaolin at 4 %, Purshade at 4%, Screen Duo at 12 cm^3/L, GA_3 at 10 ppm+ 2 % Urea, Kaolin at 4 % + GA_3 at 10 ppm+ 2 % Urea, Purshade at 4% + GA_3 at 10 ppm+ 2 % Urea and Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea comparing with non-application. The application of Screen Duo surpassed the application of Kaolin, Purshade and GA_3 plus Urea in this respect. The lowest values of these leaf chemical components were recorded on the vines that received three sprays of a mixture of Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea. The untreated vines produced the lowest values. Similar results were announced during both seasons. Untreated vines gave the maximum values (33.73 % and 34.95 %, respectively).

The reducing effect of Kaolin, Purshade, Screen Duo on reducing sunburn damage might be attributed to its effect in reducing both fruit temperature and exposure to U.V. radiation. The beneficial effect of Kaolin on leaving a protective powdery film on the surfaces of fruits could explain the present results (Melgarejo, 2004).

The positive action of GA_3 and Urea on increasing the vegetative growth of vines Lead to reduce high temperature.

These results are in harmony with those obtained by Dinis *et al.,* (2016), Bernardo *et al.,* (2017), Dinis *et al.,* (2018), Sharma *et al.,* (2018), and Frioni *et al.,* (2019) and Luzio *et al.,* (2021) who worked on kaolin, Ahmed *et al*., (2013) who worked on Purshade as well as Zaky *et al.*, 92018) and Baiea *et al*., (2018) who worked on Screen Duo.

Table 3. Effect of spraying Kaolin, Purshade, Screen Duo and GA_3 plus Urea on sunburned berries %, yield (kg.), average No. of clusters/vine, Cluster length (cm), Cluster width (cm) and cluster weight of Red globe grapevines during 2019 and 2020 seasons.

Treatments	Yield/vine (Kg)		Average No. of clusters/vine		Cluster length (cm)		Cluster width(cm)		Cluster weight (g.)	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Control	17.517	17.282	25.6	25.10	22.00	20.93	11.23	12.00	683.9	688.67
Kaolin	19.400	18.634	27.8	26.8	26.00	24.33	13.26	14.50	696.67	695.33
Purshade	18.600	17.675	27.7	26.7	24.333	23.16	12.63	13.66	670.00	662.00
Screen Duo	19.700	20.326	27.8	28.9	23.66	23.66	14.40	14.00	706.67	703.33
GA_3+ Urea	16.333	16.651	22.8	23.6	23.67	24.00	14.73	15.20	715.43	705.57
Kaolin+GA_3+Urea	20.933	20.934	27.9	28.00	30.33	27.66	15.90	16.36	747.77	747.67
Purshade + GA_3+Urea	20.367	19.402	27.9	26.7	28.66	26.66	15.10	16.00	728.9	726.67
Screen Duo+GA_3+Urea	22.100	22.847	28.0	28.5	33.33	29.66	16.76	17.23	786.67	801.67
New L.S.D. at 5%	0.60	0.72	N.S	N.S	2.11	1.86	0.60	0.62	17.62	16.87

Yield components

It is evident from the data in Table 4 that the application of all treatments significantly was responsible for improving yield, cluster weight, cluster length and cluster width comparing to the control treatment. There was insignificant difference on Average number of clusters per vine in all treatments. of clusters/vine. Using Screen Duo was preferable to using Kaolin, Purshade and GA_3 + Urea in two seasons and using this material combined with GA_3 + Urea preferable than using this material alone. Treatment with Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea gave the best results concerning yield. Such a promised treatment gave yield reached 22.100 and 22.847kg compared with yield that reached 17.517 and 17.282 kg for the control treatment. The percentage of the increase due to the promised treatment over the check treatment reached 26.16 and 32.16 % during both seasons, respectively. These results were true during both seasons.

Table 4. Effect of spraying Kaolin, Purshade, Screen Duo and GA_3 plus Urea on Berry weight(g), berry length (CM), berry width and Sunburned berries % of Red globe grapevines during 2019 and 2020 seasons.

Treatments	Berry weight (g)		Berry length (cm)		Berry width (cm)		Sunburned berries %	
	2019	2020	2019	2020	2019	2020	2019	2020
Control	8.35	8.4	2.73	2.90	2.42	2.49	33.73	34.95
kaolin	8.96	8.86	2.63	2.68	2.66	2.81	13.49	12.97
Purshade	8.63	8.68	3.16	3.21	2.56	2.70	15.36	14.77
Screen Duo	9.4	9.44	2.93	3.08	2.76	2.88	10.60	10.30
GA_3+ Urea	9.16	9.46	3.15	3.20	2.93	3.00	١3.٥3	١4.٥٠
Kaolin+GA_3+Urea	9.61	9.06	3.25	3.35	2.96	3.04	9.63	9.70
Purshade + GA_3+Urea	10.06	9.66	3.45	3.30	3.10	3.00	9.57	9.66
Screen Duo+GA_3+Urea	9.96	10.06	3.35	3.50	3.05	3.25	9.07	9.28
New L.S.D. at 5%	0.36	0.39	0.05	0.06	0.03	0.03	3.29	3.10

The reducing effect of foliage temperature due to using Kaolin, Purshade and Screen Duo may improve net photosynthesis through reducing daytime stomatal closure and daytime respiration, especially in hot dry climates, leading to better fruit retention and yield.

These results are in harmony with those obtained by Dinis *et al.,* (2016), Bernardo *et al.,* (2017), Dinis *et al.,* (2018), Sharma *et al.,* (2018), and Frioni *et al.,* (2019) and Luzio *et al.,* (2021) who worked on kaolin, Ahmed *et al*., (2013) who worked on Purshade as well as Zaky *et al.,* 92018) and Baiea *et al*., (2018) who worked on Screen Duo.

physical and chemical characteristics of the berries: -

It is noticed from the data in Table 5 that treating Red globe grapevines three times a year with Kaolin, Purshade, Screen Duo and GA_3 plus Urea significantly was accompanied with improving quality of the berries in term of increasing berry weight, berry length, berry width, total soluble solids % and total sugars %, Anthocyanin and decreasing total acidity % rather than non-application. Spraying Screen Duo was superior to the application of Kaolin, Purshade and GA_3 plus Urea in this connection. Spraying purshade at 4 %+ GA_3 at 10 ppm+ 2 % Urea gave the best results of berry weight, berry length and berry width in the first season, while in the second season spraying Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea gave the best results of berry weight, berry length and berry width. Untreated vine gave unsatisfactory effect. Spraying Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea gave the best results of total soluble solids % and total sugars %, Anthocyanin in both seasons.

The profit of Kaolin, Purshade and Screen Duo in stimulating photosynthesis and the formation of plants pigments could explain the present results.

These results are in harmony with those obtained by Dinis *et al.,* (2016), Bernardo *et al.,* (2017), Dinis *et al.,* (2018), Sharma *et al.,* (2018), and Frioni *et al.,* (2019) and Luzio *et al.,* (2021) who worked on kaolin, Ahmed *et al*., (2013) who worked on Purshade as well as Zaky *et al.,* 92018) and Baiea *et al*., (2018) who worked on Screen Duo.

Table 5. Effect of spraying Kaolin, Purshade, Screen Duo and GA_3 plus Urea on some chemical characteristics of Red globe grapevines during 2019 and 2020 seasons.

Treatments	T.S.S %		Reducing sugar		Total acidity %		Anthocyanin mg/100g FW	
	2019	2020	2019	2020	2019	2020	2019	2020
Control	16.34	16.45	13.12	13.83	0.665	0.669	23.20	22.62
kaolin	16.93	17.12	14.27	14.40	0.547	0.539	30.59	30.67
Purshade	17.36	17.37	14.45	14.47	0.615	0.550	27.56	27.25
Screen Duo	17.98	17.71	14.59	14.60	0.551	0.542	29.84	30.26
GA_3+ Urea	16.58	16.80	14.18	14.25	0.617	0.615	30.44	30.69
Kaolin+GA_3+Urea	18.60	18.49	15.0	15.48	0.592	0.568	30.86	30.61
Purshade + GA_3+Urea	18.37	18.30	14.81	14.68	0.522	0.517	31.53	31.63
Screen Duo+GA_3+Urea	18.87	19.22	15.60	17.15	0.506	0.503	31.63	31.80
New L.S.D. at 5%	0.22	0.30	0.004	0.004	0.004	0.004	2.61	2.71

CONCLUSION

For protecting Red globe grapevines from sunburn and improving yield, it is suggested to use Screen Duo at 12 cm^3/L+ GA_3 at 10 ppm+ 2 % Urea, by spraying Screen Duo three times at (First-June, mid-June and mid-July) and spraying GA_3 plus Urea twice at two weeks after fruit setting and 30 days later.

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استخدام بعض المعاملات لتقليل لضربة الشمس على العنب الريد جلوب

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تم دراسة تأثير رش الكاولين بتركيز ٤ %، البورشاد بتركيز ٤ %، سكرين دو بتركيز ١٢ سم٣/ لتر و الجبريللين بتركيز ١٠ جزء في المليون + اليوريا بتركيز ٢ % بصورة مفردة او مشتركة في تخفيف حدة التأثيرات الضارة لضربة الشمس على كمية المحصول وخصائص الجودة في كرمات العنب الريد جلوب خلال موسمي ٢٠١٩، ٢٠٢٠. ولقد تم رش الكرمات ثلاث مرات بالكاولين، البورشاد و الاسكرين دو في (اول يونية، منتصف يونية و منتصف يوليو) ورش الجبريللين + اليوريا مرتين (بعد العقد بأسبوعين و بعد شهر من الرشة الأولى). ولقد أشارت نتائج الدراسة أن رش كلا من الكاولين، البورشاد، سكرين دو و الجبريللين + اليوريا قد أدي إلي تقليل النسبة المئوية للحبات المصابة بضربة الشمس وتحسين تلوين الحبات والإنتاجية وذلك بالمقارنة بعدم الرش وكان استخدام سكرين دو متفوقا عن استخدام الكاولين، البورشاد و الجبريللين + اليوريا في تقليل الأثر الضار لضربة الشمس وتحسين كمية المحصول كما ونوعا. أمكن الحصول على أفضل النتائج عند معاملة كرمات العنب الريد جلوب ب سكرين دو بتركيز ١٢ سم٣/لتر + الجبريللين بتركيز ١٠ جزء في المليون + اليوريا بتركيز ٢ %.يقترح رش الاسكرين دو بتركيز ١٢ سم٣/لتر ثلاث مرات (اول يونية، منتصف يونية و منتصف يوليو) بالإضافة الى رش الجبريللين بتركيز ١٠ جزء في المليون + اليوريا بتركيز ٢ % مرتان (بعد العقد بأسبوعين و بعد شهر من الرشة الأولى). وذلك لتقليل التأثيرات الضارة لضربة الشمس علي إنتاجية كرمات العنب الرومي الأحمر النامي تحت ظروف منطقة المنيا.